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Clinical Insights into Down Syndrome (Trisomy 21) and Intellectual Disability Disorder: A Clinical Case Study

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Abstract

This study explored a single case about a 6-year-old girl with Down syndrome (Trisomy 21) and co-morbid with a moderate level of intellectual disability disorder. She was showing complaints of lack of social skills, poor speech, difficulty in fine motor skills, reduced sharing of emotions, poor self-help skills, lagging from her peers in academics, and having a history of delayed milestones. The informal and formal assessments consisted of clinical interviews with parents and teachers, behavior observation, identification of reinforcement survey, creating the baseline charts for problematic behaviors, comparison of the developmental milestones (Centers for Disease Control and Prevention, 2018),consulting the portage guide to early education (Sturmey & Crisp, 1986), the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition, Text Revision (DSM-5-TR) in 2022 criteria, and Raven-colored progressive matrices (Raven, 2000). The case was conceptualized by using the biopsychosocial model (Engel,1977). After analyzing the assessment, the child was diagnosed with an Intellectual Disability Disorder of moderate level (F 71) with Down syndrome. A management plan was devised and implemented. The Individualized Intervention Plan incorporated behavior therapy such as reinforcement, prompting, imitation, symbolic modeling, shaping, chaining, fading, floor time (DIR), and pivotal response treatment (PRT) were used to overcome problematic behaviors and encourage communication and social skills. The difference between pre-assessment and post-assessment clearly showed improvement in the client's selected tasks like stubbornness and spitting hitting and nail biting by 80% after 16 sessions.

Keywords: Down syndrome, intellectual disability disorder, the biopsychosocial model

Introduction

Down syndrome (DS) is a chromosomal spectrum disorder typically having a specific genotype (genes) and phenotype (physical appearance). The specific genetical makeup (genotype) resulting from another copy of a chromosome of 21, also called (trisomy-21) (Kagan et al, 2008), and the physical appearance (phenotype) includes a flatter face, shorter neck, almond-shaped eyes, small nose and mouth, broad hands with shorter fingers (National Down Syndrome Society, 2020). It influences approximately 1 in 70 at birth globally mentioned by Centers for Disease Control and Prevention (CDCP, 2018), and 1 in 300 newborns with DS in Pakistan (Gustavson et al, 2005). A child with DS usually experiences delays in speech, motor coordination, and cognitive functioning. Intellectual disability is a characteristic almost observed in all cases of DS. According to the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition, Text Revision (DSM-5 TR) in 2022 intellectual developmental disorder (IDD) is diagnosed when there is a deficit in intellectual and adaptive functioning and the onset is during developmental age. Approximately, 40-50% of the child with Down syndrome present congenital heart defects and females have 12 % more risk for heart defects as compared to the men (Gilany et al, 2017).

Many researches revealed that behavioral problems are more prevailing among children with Down syndrome compared to typically developing children. However,there is no permanent cure of this disorder but individually tailored psycho-social therapeutic interventions are needed to address the problems faced by the children with Down syndrome (Dey, 2013). Though, significant studies have been done to understand DS, but still several research gaps exist, specifically in areas related to adaptive functioning, assessment and treatment of co-morbid neurodevelopmental disorders, the long-term efficacy of therapeutic interventions, and individualized support strategies (Vicari et al, 203).Furthermore, it is crucial to investigate the cognitive and social trajectories and the impact of early interventions on language development, social skills, and executive functioning in children with DS and IDD (Burke et al, 2019).They are also on elevated risk of physical health complications, including cardiac defects, hearing impairments, and obesity, as well as mental health problems, such as anxiety, depression, and ADHD (Naerland et al, 2017). Nevertheless, researches are scare on the prevalence, risk factors, and effective interventions for these comorbidities among this population. Effective, evidence-based behavioral interventions for managing aggressive, self-injurious, and other problematic behaviors are still limited. Further investigations are needed about genetic and environmental factors interactions which influence cognitive and behavioral outcomes. This may explain why certain individuals with DS exhibit more severe symptoms than others. Research regarding efficacy of inclusive education programs for individuals with DS and IDD is still insufficient(Bello et al,2014). The mental health and well-being of caregivers, often affected by the demanding role of assisting someone with DS or IDD, remain under-investigation. Further research should explore the impact of having a family member or sibling with disabilities. Researches are required to design practical, sociable and culturally appropriate interventions to address challenges facing by children with DS and IDD.

This article demonstrated a single clinical case study to illustrate psycho-diagnostic and psycho-therapeutic strategies for Down syndrome with intellectual disability disorder and emphasize further research needed that could improve outcomes in the long term by devising individual intervention plans for each special child. Empirical evidence on the effectiveness of behavioral therapy for children with neurodevelopmental disorders remains limited in our cultural context. Furthermore, this study paves the way for clinical psychologists to develop behavioral therapeutic intervention plans and counseling strategies, that benefiting not only the special children but also caregivers and society.

Theoretical Framework

The biopsychosocial model by Engel (1977) shows that genetic deformity affects cognitive abilities and interpersonal well-being. By applying behavioral and social skill approaches, the caregivers, healthcare providers, and educators can maximize the cognitive health, social functioning, and emotional well-being of individuals with Down syndrome and Intellectual Disability Disorder.

The study objectives

The main objectives of this study were to explore the behavioral interventions used, the challenges faced and the role of family and community in child psychological and developmental journey who was suffering with Down syndrome (DS) and intellectual developmental disorder (IDD) by a single case study.

Research Hypotheses

Behavior therapy (BT) largely decreases the symptomatology of Down syndrome (DS) and Intellectual Disability Disorder, such as stubborn behavior, language and communication issues, social skills, and self-help issues.

Method

Research Design

ABA, a single-case research design was used for assessing the efficacy for the treatment protocol of Behavior Therapy for Down syndrome and Intellectual Disability Disorder.

Sample

The 6-year-old child visited a special child institution with complaints of lack of social skills, poor speech, difficulty in fine motor skills, low concentration, reduced sharing of emotions, poor self-help skills, lagging her peers in academics, and a history of delayed milestones. The child was referred to a trainee clinical psychologist for assessment and management of her problems. Ethical considerations were ensured with confidentiality and obtaining informed consent from the attendant (mother).

Background Information

According to the history of the present illness, which was given by her mother, the child was born through the c-section with a typical phenotypic characteristic of Down syndrome including hypotonia, brachycephaly, upward-slanting palpebral fissures, a single palmar crease and Apgar scores at 1 and 5 minutes were 7 and 9, respectively. Her mother age was 38 years at the time of birth. There were prenatal and postnatal complications as the child's first cry was delayed and she turned blue immediately after birth. She was kept in emergency care for 2 weeks. Then the hospital informed their parents that she was a special child with Down syndrome. Neonatal complications were reported when she was 30 days old, then suffered from severe dehydration and was hospitalized for 15 days. They belonged to a small town where there was not any school for the special children, so the parents decided to move to Lahore for better education for their older children and the child's treatment. During a visit to the children's hospital in Lahore, the doctor informed them about her heart problem. Doctors recommended that any tough exercise, sports, and running were not good for the child. She could only participate in light exercises and sports. She was not taking any medicine for her heart problem but taking T-Day medicine for skin allergy and a skin ointment to soothe her skin rashes. The child's personal history showed that she did not feel any urge for thirst and urination. She only went to the toilet when someone reminded her about it. She did not like to eat on her own, and her elder sister usually fed her every meal. She frequently bites her nails. Mostly, she liked to play alone, but if she played with her cousins, she showed stubbornness, hit and spit after getting angry with them. She could only speak three words in a sentence. The mother reported that the child was not yet fully toilet trained. She still needs help with the toilet, bathing, and dressing up. No incident of bed-wetting was reported. She liked playing with dolls and watching cartoons. The child's developmental milestones were delayed. Details are given below with a comparison with normal milestones presented by the CDC (2018).

Table 1: Showing details of the Child's Developmental Milestones (Centers for Disease Control and Prevention, 2018)

Developmental Milestones	The child's age to achieved	The normal age range of
Head/neck holding	7m	3m
Social smile	9w	6-8w
Sitting	10m	6-8m
Crawling	13m	8-11m
Standing	4y	1 ½ y
Walking	17m	11-15m
Speech single word	5y	1 ½ y
Speech (complete sentence)	10y	3 ½ y-4y
Bladder control (partially)	6y	2 ½ y-3y
Taking Bath	Still with help	4y
Dressing	Still with help	4 ½ y-5y

According to the family history, the child's father and mother were 49- and 44-year-old respectively, and studied till matriculation. They belong to a middle socioeconomic class. They are first cousins. Their marital relationship was normal. They are living in a nuclear family. They both were concerned with the child's health issues, and their attitude towards the child was loving and caring. Their general health was good. Her father has his own property business. He was living back home due to his business. He visited his family on weekends only. Her mother is a housewife. They have a psychiatric family history, as the first cousin of a mother had two special children, one with Down syndrome and the other with Intellectual Developmental Disorder. The child has one elder sister aged 20 years, and she was studying for a master's in information technology at a private university. The child has a very congenial relationship with her sister. The child liked to feed and dress up from her sister only. Her sister was overprotective. If someone pointed out the child as a special child during any family event, then her sister became angry with them. The child has an elder brother aged 18 years, and he was studying Intermediate in computer sciences at a private college. The child has a friendly relationship with her brother too. The general home environment was congenial, supportive, and concerned regarding the child's illness. The parents took special care of the child and her needs.

Procedure

Assessment Measures

Informal assessment

Clinical interview

A clinical interview was conducted with the child's mother, class teacher, and sports teacher to be fully aware of the nature, severity, and etiology of the child's problems.

Opinions of experts regarding the child's condition

Class teacher

The child followed instructions and commands given by the teacher. She could speak only one or two words and needed to attend speech therapy. She took an interest in drawing, playing with blocks, football, and music. There was a need to focus on her self-help skills and language. She had significant chances to improve and progress well.

Sports Teacher
The child's gross motor skills were better than fine motor skills. She was practicing at "Young Athletes Kit" but needed practice a lot to complete its level. She was very keen to learn and could be good at sports.

Behavioral observations
The child was a 6-year-old girl. She was of a lean built and short heighted. She had chubby cheeks, large round eyes, a large tongue, a flat small nose, small ears, smaller limbs, a smaller body frame, and low muscle tone. She was an active girl. When she appeared in the session room, she was happy and willing to do activities without help. She was actively exploring the environment. Her fine motor and gross motor skills were not good. She had severe language developmental delay as she could only speak a few words sentence. Sometimes, she refused to do any task and exhibited stubborn behavior. Her ability to understand instructions was good.

Baseline Chart
The rating on a scale of 1 to 10 was done by the trainee clinical psychologist and mother to assess the presenting complaints.

Table 2: Pre-rating of Subjective Complaints by Teacher and Mother

Presenting complaints	**Presenting complaints ratings**
Poor communication	9
Poor speech	9
Poor self-help skills	9
Not telling urge for thirst and urine	9
Spitting	8
Hitting	8

Note: 0 =No Problem; 5 = Average Problem; 10 = Severe Problem

Reinforcement Identification Survey
A mini survey was conducted with the mother and class teacher by providing a reinforcement identification survey sheet to identify the child's primary and secondary reinforcers.

Table 3: Primary and Secondary Reinforcers by Teacher and Mother

Tangible Reinforcers	**Edible Reinforcers**	**Social Reinforcers**	**Activities**
stickers	chips,	praise	Doll's House,
bubbles	Candy	clapping	listen to the music,
	Chocolates		cartoon videos on mobile
	Biscuits		singing poems
	Nimko		

The Portage Guide for Early Education (PGEE)
The PGEE was administered to assess functioning in the 5 areas of self-help, cognition, motor, language, and socialization. Some questions that could not be observed directly were asked by the attendant and teacher as questions regarding self-help and socialization.

Results
Quantitative Analysis
Chronological Age: 6 years and 7 months

Table 4: Portage Guide of Early Education for the Child's Developmental Age and Age Deficits (Sturmey & Crisp, 1986)

Areas	**Calculated Developmental Age**			**Age Deficits**
	Years	**Months**	**Days**	
Language	2	6	9	4 years and 1day
Cognition	3	6	7	3years and 3days
Socialization	4	3	2	2 years, 3 months and 8 days
Self-help skills	3	4	5	3 years, 2 months and 5 days
Motor skills	4	3	1	2 years, 9 months and 9 days

Qualitative analysis
The performance of the child in the five areas of PGEE showed that the child was late in her developmental milestones as compared to other children of the same age. The child was 6 years old, and her last area of development of language with 4 years deficits, in cognition and self-help skills were 3 years and in motor skills and socialization age, deficits were 2 years, which showed significant deficits in the child's functioning. The developmental age in the self-help area was approximately 3 years, 2 months and 5 days. The child's first failure on item no.41 (asks to go to the washroom), laid in the mental age of 2-3 years. The last item that was correct in the area was item no.100 (cut with knife soft foods), which laid in the functional age 5-6 years. In the cognitive area, the developmental age was approximately 3 years 6 months and 7 days. The first missed item in this area was on item no 36 (where questions), which fell in the mental age of 2-3 years. The last correct item was item no.56 (tell items closed or open), and the last correct items fell in the age range of 2-3 years. In the motor area, the developmental age was approximately 4 years and 3 months. The first missed item in this area was on item no.82 (cut a straight line), which fell in the mental age 3-4 years. The last correct item was item no.105 (screw objects), and the last correct item fell in the age range of 4-5 years. In the language area, the developmental age was approximately 2 years, 6 months and 9 days. The first missed item in this area was on item no.69 (uses some irregular plurals e.g.; men, feet), which fell in the functional age 3-4 years. The last correct item was item no.98 (uses yesterday and tomorrow meaningfully), the last correct items fell in the age range of 5-6 years. In the socialization area, the developmental age was approximately 4 years, 3 months and 2 days. The first missed item in this area was on item no.54 (Greets familiar adults without reminder), which fell in the mental age 3-4 years. The last correct item was item no.82 (states goals for himself and carries out the activity), the last correct item fell in the age range of 5-6 years. In conclusion, the child's overall performance on PGEE depicted that the child was far behind in all developmental areas as compared to her age group.

Formal Assessment

DSM 5 –TR (2022)

Table 6: According to DSM -5 TR, the Intellectual disability disorder (IDD) criteria are given below with the Child's Symptoms and Status.

Diagnostic criteria	**Symptoms present in the client**	**Status of symptoms**
Intellectual and adaptive functioning deficits in conceptual, social, and practical domains. The following three criteria must be met.		
A. Deficits in Intellectual functioning. It must be confirmed by both clinical assessment and individualized, Standardized intelligence tests.	She has deficits in intellectual functioning like difficulties in academic learning, thinking, reasoning, decision making and problem-solving.	✓
B. Deficits in Adaptive functioning that fail to meet developmental and sociocultural standards of personal independence and social responsibility.	She has deficits in communication, and social participation across multiple environments such as home, and school.	✓
C. Onset of intellectual and adaptive deficits during the developmental periods.	Her deficits started during developmental periods and became severe by the time her milestones were delayed the family noticed deficits in intellectual and adaptive functioning at the age of 2 years.	✓

Diagnosis:

319 (F71) Intellectual Disability Disorder with Down Syndrome.

Raven Colored Progressive Matrices (Raven, 2000)

To assess the child's intellectual functioning (RCPM) was administered.

Quantitative Analysis:

Table 6: The Child's Responses on RCPM

Sr.no	**A**	**Answers**	**Ab**	**Answers**	**B**	**Answers**
1.	1	4	1	4	0	1
2.	1	5	1	5	1	6
3.	1	2	0	2	1	1
4.	1	2	0	5	0	1
5.	1	6	0	4	0	2
6.	1	3	0	5	0	4
7.	0	4	1	3	1	5
8.	0	1	0	2	0	2
9.	0	2	0	3	0	1
10.	0	1	0	1	0	4
11.	0	5	0	2	0	3
12.	0	3	0	5	0	1
TOTAL	6		3		3	

Table 7: Descriptions of Responses of the Child

Sets	Raw Score	Expected Score	Discrepancies
A	6	5	+1
Ab	3	2	+1
B	3	5	-2

Table 8: General Mental Ability of the Child

Type	Score	Grade	Percentile	Time
G.M.A	12	IV-	5^{th}	40

Qualitative Analysis

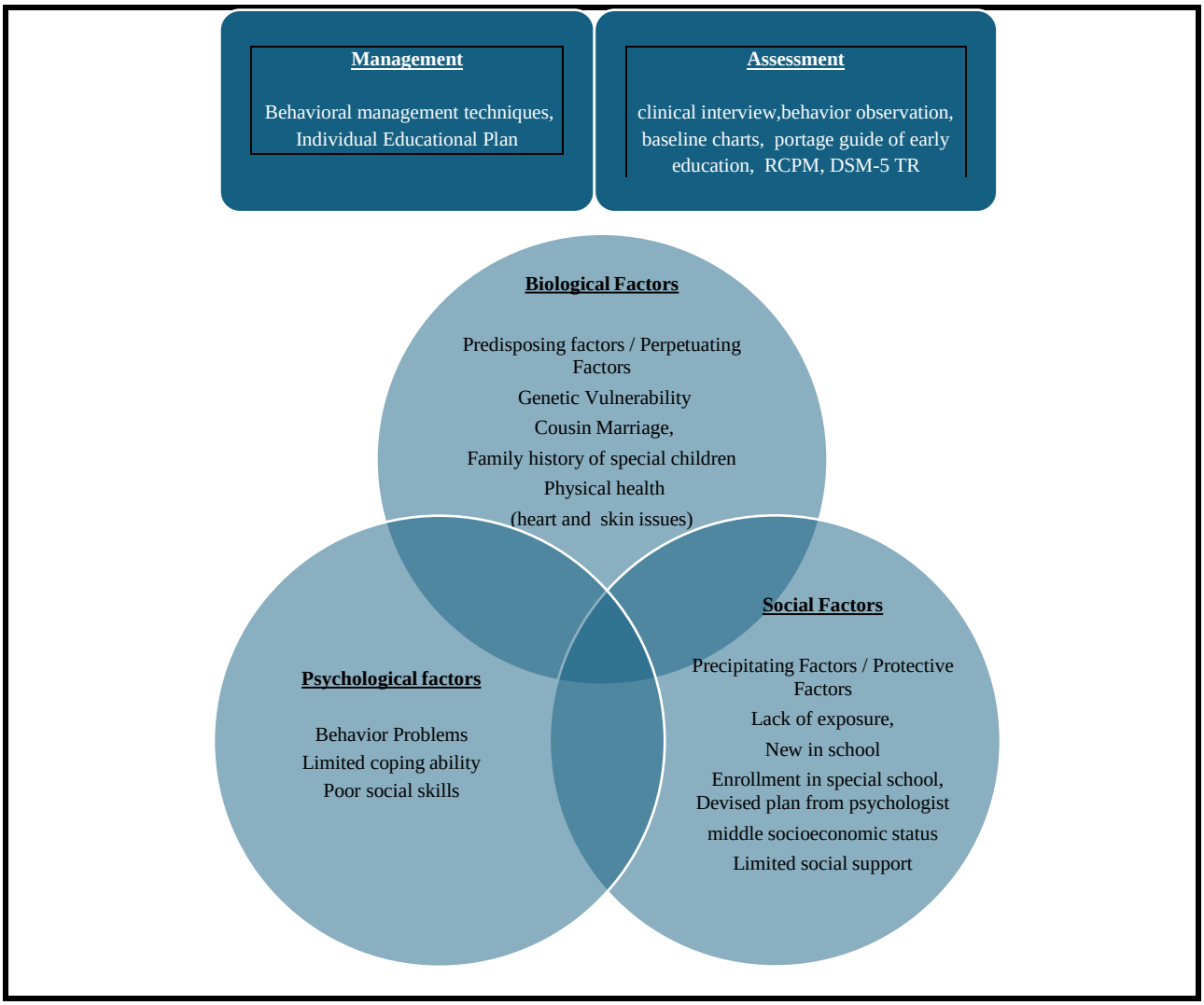
The child had obtained a total score of 12 out of 36 that fell in the IV- grade and her percentile was 5th which means that she is intellectually defective.

Procedure

Case formulation

Case conceptualization and formulation were done by elaborating biopsychosocial factors along with assessment and treatment options.

Figure 1: An idiosyncratic Case Conceptualization using the Biopsychosocial Model (Engel,1977).



Management Plan:
The management plan for the child was devised on the principles of behavior therapy (BT).
Short-term Goals:

- **Rapport** will be established to maintain a supportive and trustworthy relationship between the therapist and the child.
- **Psychoeducation** will be given to the parents regarding the child's illness.
- **Floor time (DIR)** was applied to expand the child's communication and social circle.
- **Pivotal Response** is applied to encourage the child to initiate conversation and make requests.
- **Different behavior modification techniques** such as prompting, reinforcement modeling,shaping,chaining,fading etc. were used to help the child learn new skills.
- **Group activities were** conducted to enhance the child's socialization and communication like singing, playing dolls and musical chairs.
- **Individualized Education Program (IEP)** was formulated to attain new skills.

Long Term Goals:

- Continuation of short-term goals so that the child may carry out her learnt skills.
- IEP goals were carried out.
- Follow up sessions were planned.

Summary of Psychotherapeutic Interventions:
Psychoeducation
The child's mother was psycho-educated regarding the child's DS and IDD symptoms, etiology, prognosis, and treatment. The bibliography was handed over to her mother to further read about it.

Mother Counseling and training
She was suggested to apply different activities like wrapping things and then open wraps with her and express excitement and happiness while doing different tasks including arts, crafts, and music would make her more expressive and energetic. Moreover, differential reinforcement and physical restraint (when necessary) were suggested to control the child's problematic behavior like spitting, nail-biting, hitting and stubbornness etc. The written instructions about taking the daily session at home were given.

Group Activities
Several group activities were conducted to facilitate the child. In art class, the child socialized with other children, and all engaged in cooperative activity. They expressed their ideas and feelings through artwork. The child played mutually with other groups of the child like dolls and musical chairs to learn social skills, motor skills and communication.

Behavior Modification
The goals of behavior modification procedures are to decrease the occurrence of undesirable behaviors stubbornness, spitting and hitting etc.

Reciprocity technique
It was used to establish rapport with the child by playing with a doll's house and talking about her different toys and a trip to her grandmother's house in a village.

Task Analysis
All the selected tasks for treatment were broken down into the simplest forms to better understand the child. Tasks are mentioned below in discrete trials.

Discrete trial
As for the child, all tasks were divided into simple parts and practiced continuously.

Positive reinforcement
The child was reinforced by reinforcers like candy, chocolate, nimko and chips, praise (clapping, well done, star, stickers doing a favorite activity) and treats (candy, chips, and biscuits) used after completion of the task like eating her own and not hurting others.

Premack Principle
The child was asked to eat with her hand then she could watch her favorite cartoon.

Token Economy
Conditioned reinforcers like candy, chocolate, nimko and chips, were used as TOKENS and presented to a child after showing compliance behaviors like stop biting nails etc.

Symbolic Modeling
Modeling was used to teach the child how to tie knots and how to cut in a straight line. Moreover, video modeling was used to teach the child about good and bad behavior through cartoon videos (Jan) in the Urdu language. Further, role play was conducted by a trainee clinical psychologist to teach the child about how to eat independently.

Shaping
The components of a particular skill are reinforced step by step to shape a desired behavior such as each time a child draws a straight line on a paper was receives a praise or treat.

Chaining
In complex tasks forward chaining (FC), backward chaining (BC) were used. (FC) included picking up a brush, washing it, applying toothpaste, brushing teeth, rinsing the mouth and washing the toothbrush. In (BC), this included washing toothbrush, rinsing mouth, applying tooth paste and brushing teeth etc.

Extinction
This includes actions like not looking, talking, or physical contact with the child during exhibited problematic behavior such as spitting, hitting and nail-biting were extincted by ignoring.

Aversion technique
The child was explained that due to her angry behavior, no one would like her any more

Punishment
As for the child-guided compliance time out, response cost, over-correction, physical restraint, positive practice etc. were used timely.

Prompts
Visual prompts were given to the child to boost her performance in cognitive (identifying colors) and self-help domains (tie the knot), and gestural prompts and verbal prompts were given in all domains (motor, social, cognitive, self-help and language) to improve the child's performance. Stimulus prompt was given with removal or addition with stimulus to teach the child skills. For example, to teach the child how to tie a simple knot the child's hand can be held by the therapist at first when the task was initially introduced, next the therapist did the modeling for the child to imitate the tie the simple knot and then the child was only provided with verbal prompts. Similarly, while teaching to cut along a straight line, firstly physical prompt was given then the therapist did the modeling for the child to imitate, then the child was provided with gestural prompts and then

only the verbal prompts were provided until the child was able to do the task on her own. Extra stimulus prompting marking lines on the hard paper while cutting straight lines. Within stimulus prompting when asked to point to the 'big' objects the picture with the 'big object' was put a bit close to the child. Some other types of prompts, positional prompts, gestural prompts, partial physical prompts, full physical prompts (hand over hand), verbal cues, and inadvertent prompts were used to teach the child different tasks.

Fading

Physical prompts were reduced gradually using fading techniques in some tasks like cutting straight lines and the tie knot concept.

Summary of sessions

In the first two sessions, the unstructured clinical interview was conducted with the mother and initial behavioral observation was done while the child was playing. A reinforcement survey was also conducted in the second session with the child's mother and teachers. In the 3rd session, significant information regarding the child's problem was gathered from different experts with whom the child had interaction daily like a class teacher and sports teacher on the baseline chart. Rapport was built through one-to-one interaction between the therapist and the child in the third session by talking with the child about her favorite topics (favorite cartoons, poems and visits to grandmother's house). Common interests and her daily routine were also explored by the child. In the 4th and 5th sessions, trainee clinical psychologists worked on further rapport building and assessment by administrating the Portage Guide to Early Education (PGEE) and, Diagnostic Statistical Manual (DSM-5 TR), and information was also collected from the teacher and mother where direct observation and assessment was not possible. Raven-colored progressive matrices (RCPM) were administered to check the child's intelligence quotient (IQ). In the 6th and 7th sessions, after proper assessment, the child's mother was psycho-educated regarding symptoms, causes, prognosis and treatment. The management plan was devised with the collaboration of the child's teacher and mother. Other sessions from the 8th to the 16th consisted of the Individual Education Plan and Behavior therapy techniques. Selected tasks were pre-rated by the therapist and mother. At the termination of therapy, post-ratings were done that showed significant improvement by 80%, and important suggestions were given to the mother and teacher regarding her future individual educational plan.

Task Analysis

Area: Self-help

Behavioral objective: To fold her handkerchief.

Terminal goal: The child will be able to fold her handkerchief.

Duration: 4/5 sessions

Reinforcers: Clapping, praise,stars

Prompts: Physical and verbal

Trials:

1. Place the handkerchief flat on the table with one corner facing her.
2. Take the bottom edge of the handkerchief and bring it up to meet the top edge into two halves.
3. Therapist said: "Well-done, Let's make it nice and flat!"
4. Take the left side of the handkerchief and fold it over to the right side into four halves.

Area: Self-help

Behavioral Objective: To tie a knot.

Terminal goal: The child will be able to tie a knot on the shoe board.

Duration: 4/5 sessions

Reinforcers: Clapping, praise,stars
Prompts: Physical and verbal

Trials:

1. Hold one lace in each hand.
2. Cross the right lace over the left lace.
3. Tuck the right lace under the left lace.
4. Pull both laces tight to make first knot.
5. Make a loop (bunny ear) with the right lace.
6. Hold loop in right hand.
7. Use left lace to wrap around the loop.
8. Pull the left lace through the hole created when wrapping around the loop.
9. Explained: “Well-done, it looks like a bunny going into its hole”.
10. Hold both loops (bunny ears) and pull them tight.
11. Encouraged the child to saying “Pull tight and clap”.

Results

IEP pre and post assessment

The child’s IEP was also devised based on the scoring of the Portage Guide to Early Education (PGEE). The therapist aimed to keep the IEP as realistic as possible.
The pre and post-intervention scoring was done by subjective rating of the therapist and mother. By using a 1 to 100 points rating scale.

Table 10

Pre and post-assessment by subjective Rating of IEP by trainee clinical psychologist and the Child's Mother.

Areas	Task	Previous Functioning Level %) by the therapist	Previous Functioning Level (%) by parents	Present Functioning Level (%) by therapist	Present Functioning Level (%) by parents
Cognition	to identify five colors (red, blue, yellow, green and orange)	20%	20%	70%	80%
Self-help	to tie knots on the shoe board.	10%	5%	80%	80%
Motor	to cut along a straight line about 1 inch long on hard paper.	10%	10%	70%	70%
Socialization	to say thank you after getting things from others 70 % of the time without a reminder.	30%	20%	90%	90%
Motor	to practice pre-writing skills (Slant, tick, cross).	20%	20%	60%	70%

Cognition	to point out big and small objects upon request.	30%	30%	97%	95%
Cognition	to count by rote 1-5 objects, trace and recognize numbers.	5%	5%	85%	80%
Cognition	to trace A to C capital letters and recognize them.	5%	5%	70%	80%
Language	learn 5 body parts (eyes, nose, ears, mouth and hair).	10%	10%	65%	70%
Self-help	To fold handkerchief	10%	10%	80%	80%

Note: 0% =No Problem; 50%= Average Problem; 100%= Severe Problem

Graphs

Figure 1: Graphical Representation of Pre and Post-Assessment Ratings given by Trainee Clinical Psychologist

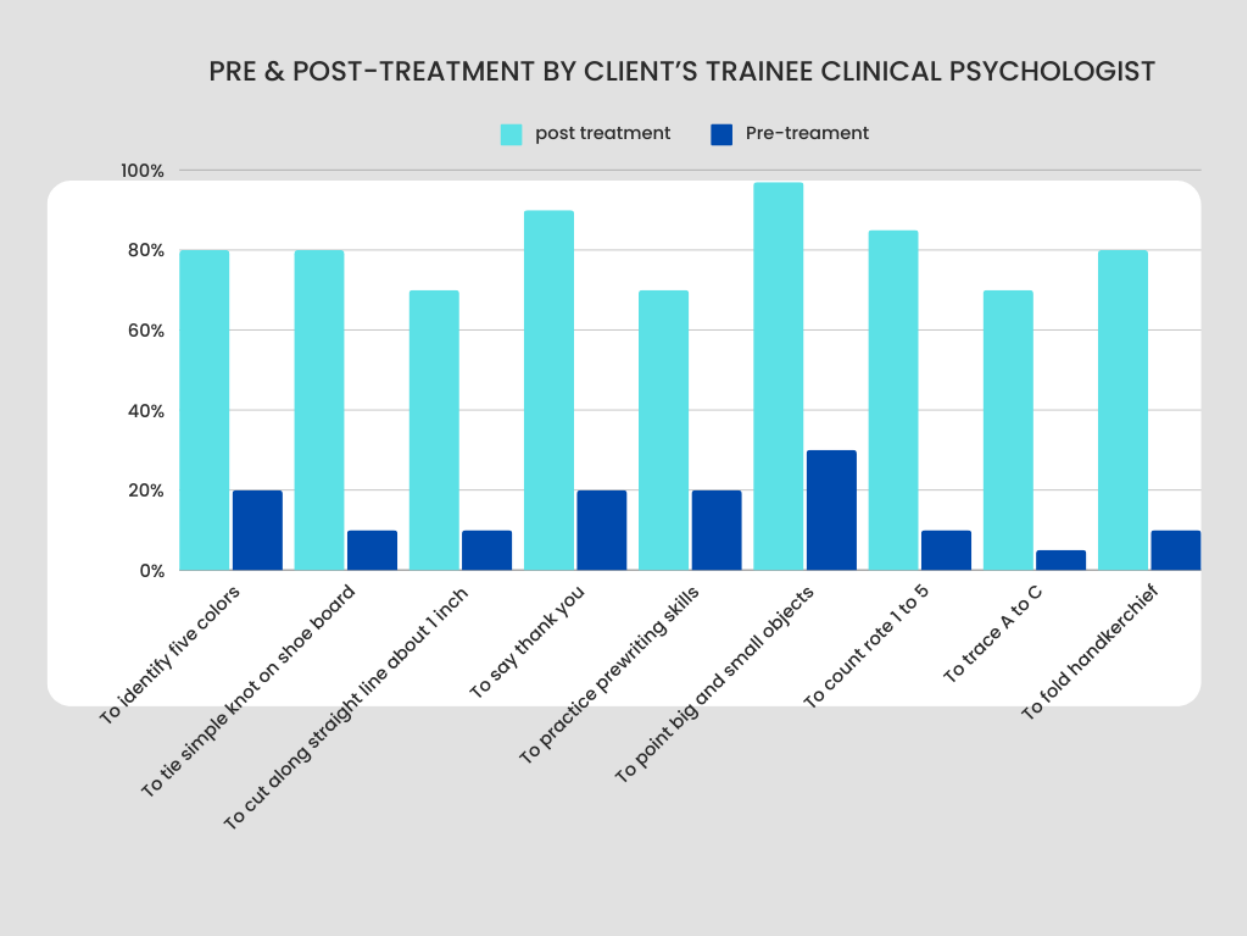
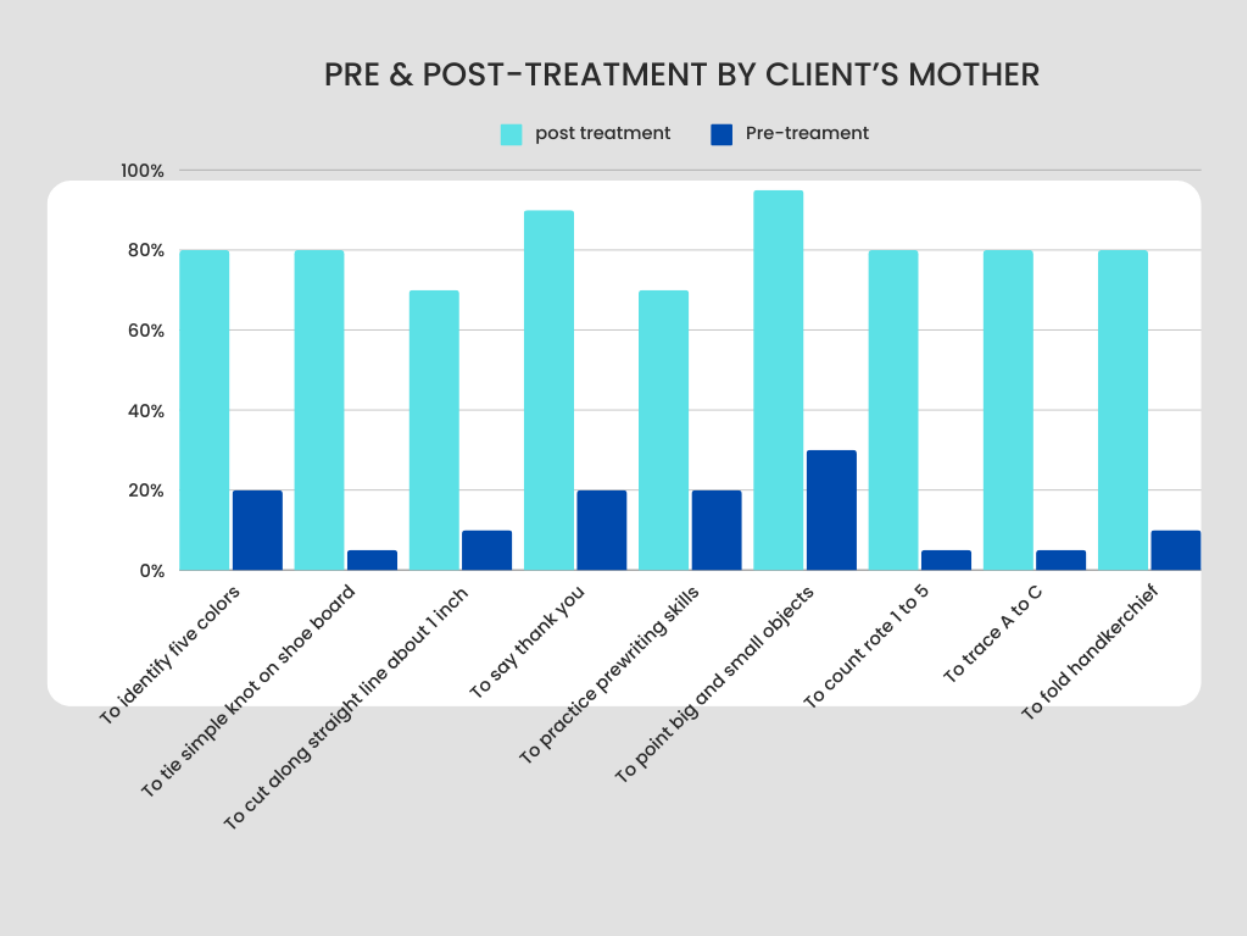


Figure 2: Graphical Representation of Pre and Post Assessment Ratings given by the Child's Mother.



Outcome

The child's overall improvement in all selected tasks was noteworthy, which was more than 80%.

Termination and follow up

At the termination of therapy, the child's follow-up sessions were planned with a school psychologist. Therapy blueprints were given to her teacher and mother regarding her future educational and behavioral modification plans.

Conclusion

This clinical case study can be a hope for the children with Down syndrome and intellectual developmental disorder. The value of appropriate early interventions through individual intervention plan along behavioral therapy is important to trained these children and later include them in regular classrooms. They have significant potential to achieve outstanding gains through parent advocacy and professional assistance.

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