ADVANCE SOCIAL SCIENCE ARCHIVE JOURNAL
Available Online: https://assajournal.com
Vol. 04 No. 01. July-September 2025.Page#.1865-1878
Print ISSN: 3006-2497 Online ISSN: 3006-2500
Platform & Workflow by: Open Journal Systems
https://doi.org/10.55966/assaj.2025.4.1.0102

Parental Perspectives on the Role of Applied Behavior Analysis (ABA) Therapy in Managing Behaviors of Children with Autism Spectrum Disorder in Gilgit-Baltistan

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Abstract
Autism Spectrum Disorder (ASD) presents significant challenges in social interaction, communication, and adaptive behaviors, particularly in resource-limited regions like Gilgit-Baltistan, Pakistan. This study examines parental perspectives on the effectiveness of Applied Behavior Analysis (ABA) therapy in managing behaviors of children with ASD, focusing on social skills, activities of daily living (ADLs), and academic skills. Using a quantitative descriptive design, data were collected from 52 parents through a validated Likert-scale questionnaire (Cronbach's alpha = 0.804) via convenience sampling. SPSS version 26 was used for analysis, employing descriptive statistics, t-tests, and one-way ANOVA. Results showed moderate improvements (mean scores: 2.11–2.88) across domains. No significant differences were observed based on parents' age, education, profession, or child's age. Therapy duration significantly impacted academic skills ($F = 3.971$, $p = 0.025$), with frequent sessions yielding better outcomes. A gender-based difference in academic perceptions was noted ($t = 26.09$, $p < 0.001$). The findings highlight ABA's potential, recommending increased session frequency and further research on gender disparities.

***Key words**: Autism, ABA Therapy, Parental Perspectives, Social Skills, Academic Skills*

INTRODUCTION
Autism Spectrum Disorder (ASD) is a neurodevelopmental disorder that affects a child's ability to interact socially, to communicate, or demonstrate adaptive behaviors. Autism is defined by continuous obstacles in social interaction and communication. A teenager also shows restricted and repetitive behavior patterns or interests (American Psychiatric Association, 2018). Although the exact causes of Autism spectrum disorder is still not clear, it is widely recognized that genetic and environmental factors influence the development of ASD (Lord et al., 2020). Globally, better diagnostic methods, public awareness, or the broader screening guidelines contribute to an

increase in reported cases of ASD According to recent research statistics, there are about 1 in 36 children in the United States is diagnosed with Autism spectrum disorder (CDC, 2023).

The Children with Autism Spectrum Disorder (ASD) repeatedly display many challenging behaviors, like aggression, tantrums, resistance to change, and self-injurious behavior (Matson et al., 2019). These behaviors interfere with learning and social interactions and make them difficult for them, while they're also causing emotional distress on parents and families. So, it is important to apply evidence-based interventions which focus on managing and improving undesirable behavior and improving social interaction and daily functioning. Applied behavior is also one of the most popular and effective therapies for ASD.

Applied behavior analysis therapy is based on behaviorism principles, which focus on how environmental factors influence and shape behavior with punishment, reinforcement, and extinction (Cooper et al., 2020). This intervention therapy follows a structured technique which helps to improve social skills by encouraging positive behaviors and thoroughly decreasing undesired ones. Applied behavior analysis therapy is tailored according to individual needs, focused, and constantly observed through data-based methods to validate its effectiveness. Many studies have shown that Applied Behavior Analysis therapy is effective in enhancing academic

Achievement, communication skills, Adaptive daily living skills, and social interactions among children with ASD (Leaf et al., 2021; Weitlauf et al., 2020)

Latest ABA programs use a variety of techniques modified to meet individual needs. Include Discrete Trail Training (DDT)**.** It involves teaching skills through repetitive, structured trials and immediate reinforcement. Verbal Behavior Therapy (VBT) aims to improve functional communication by employing operant conditioning principles in language development. Meanwhile, Natural Environmental teaching (NET) involves providing behavior intervention in everyday situations. (Sundberg & Michael, 2020). Together, these methods establish the groundwork for Applied Behavior Analysis Therapy's effectiveness across various areas of development.

However, even with the recognized benefits of ABA therapy, implementing such programs in a limited resources environment presents specific challenges. In regions like Gilgit Baltistan, the lack of qualified and trained professionals, limited availability of diagnostic tests or services, remote location, and cultural stigma related to developmental disorders interfere with the timely and effective delivery of Applied Behavior Analysis therapy-based interventions (Saeed et al., 2021). Also, local communities might have limited awareness of ASD, which can result in delays in diagnosis and treatment of ASD.

On the other hand, global health literature emphasizes the importance of early intervention in Autism spectrum disorder, that's promotes better functional outcomes and quality of life (Zwaigenbaum et al., 2019). In settings with low resources, community-based models that include training for the local caregivers and paraprofessionals have shown potential in increasing access to behavioral interventions and services. Adapting Applied Behavior Analysis for these contexts demands cultural sensitivity, collaborative involvement from parents and educators, and tailored training modules (Ruparelia et al., 2021).

While the international evidence supporting ABA is extensive, there exists a notable lack of research concerning its implementation in regions such as Gilgit Baltistan. Most studies have focused on urban or developed regions, rather than giving attention to remote underserved

Communities. Understanding the perceptions of parents in these areas related to the effectiveness of Applied Behavior Analysis therapy on their children's behavior is important. Their perspectives can highlight both the advantages and drawbacks of Applied Behavior Analysis therapy in environments limited by healthcare resources and cultural obstacles (Bashir, Khanum, & Mobeen-Ul-Islam, 2024).

LITERATURE REVIEW

Autism is a complex neurodevelopmental condition usually identified in children of age between one and a half to three years. This condition influences a child's socialization, insight, and collaboration. It is estimated that 350,000 children in Pakistan are experiencing the ill effects of autism, and this number is expanding with the passing days. Exhaustive experts and particular hardware are required to instruct and prepare the individuals with autism. There is very limited to no awareness about ASD in Pakistan. Therefore, there are not many places that are well equipped enough to accommodate these children in accordance to their needs (Bashir, Khanum, & Mobeen-Ul-Islam, 2024). Autistic Children may also exhibit emotional problems (e.g., depression, anxiety, sleeping disorders etcetera), social and peer problems (including alienation), and behavioral problems (e.g., hyperactivity, aggression, attention deficit etcetera) (Maskey et al., 2013) .Many parents of Autistic children have reported various manifestations of anxiety and depression in their children, which include symptoms like overthinking, breathing difficulties, palpitations, sweating palms, pessimism, gloomy mood, and a lake of ambition or initiative (Al-Farsi, 2020) . For parents and teachers, the comorbid conditions can be sometimes even more concerning than the core features of ASD, with a profound impact when it comes to behavior management, learning acquisition, and enabling socialization (Pearson, 2006)

Applied behavior analysis (ABA) refers to the practical application of the scientific principles of learning and behavior; it is used to develop and understand all the socially important behaviors. Practitioners of ABA tend to increase the inculcation of functional and meaningful behaviors within an individual.

According to the Behavior Analyst Certification Board (2019). ABA is a well-developed scientific discipline that focuses on analysis, implementation, and evaluation of the environmental variables. ABA is based on the observation of functional analysis of the relations between the environment and an individual's behavior. Behavior can be regulated by adjusting environmental events, including antecedent stimuli and results. Behavior analysts aim to produce significant and practical changes in meaningful behavior, which are necessary to improve the quality of life of an individual.

In the 1980s, Lovaas first implemented the ABA treatment for the UCLA-Young Autism Project, which became very famous due to the resulting dramatic improvements in autistic children (Makrygianni, 2018). To provide additional support to the effectiveness of ABA methods, since

the 1980s, different researchers, psychologists, and therapists have conducted various studies which concluded that the ABA method has the potential to improve children's adaptive behavior, IQ scores, language skills, and reduce autistic symptoms (Makrygianni, 2018).

Some ABA-based treatment models that are studied in this review include early intensive behavioral intervention (EIBI), Early Start Denver Model (ESDM), and Learning Experiences: An Alternative Program for Preschoolers and Their Parents (LEAP). EIBI is a comprehensive ABA-based treatment model especially for young autistic children. EIBI is usually for children who are below the age of 5 years and is often administered for around 20–40 hours per week for a couple of consecutive (Matson, 2008).

It is conducted in a structured setting with one-to-one interaction and often involves the discrete trial training (DTT) method (Cohen, 2006) along with other, less structured methods of teaching for example, natural environment (Neimy & Pelaez, 2021).

Since this is an all-comprehensive treatment model, all the aspects of functioning (like: independent living skills, motor skills, social skills, language, pre-academic and academic skills etcetera) are under the target of this intervention (Neimy & Pelaez, 2021). ESDM is another comprehensive ABA-based treatment model which was developed for children with ASD who fall within the age brackets of 12–60 months. This intervention involves the naturalistic teaching

Methods within ABA for the provision of a detailed, developmental, and relationship-based behavioral intervention as early childhood developmental (Dawson, 2010). Of late, there has been a recent shift in some comprehensive ABA treatment models from intensive, one-to-one operant conditioning models into more naturalistic programming. LEAP is a similar model for autistic children due to the fact that it takes place in public school settings (Strain, 2011). Apart from being developed from the fundamental principles of ABA, LEAP also includes a variety of methods that are commonly used in ABA such as time delay and incidental teaching, Pivotal Response Training (PRT), and utilization of peer-mediated interventions and the PECS (Strain, 2011). A strong emphasis is placed on parental and peer involvement as a core principle of LEAP in terms of teaching behavioral strategies, and LEAP relies more on naturally occurring teaching arrangements rather than the directional and adult-driven instruction that are commonly used in most other segregated ABA intervention strategies (Strain, 2011).

MATERIAL AND METHODS

RESEARCH DESIGN

The research design employed in this study is quantitative and descriptive, emphasizing the analysis of numerical data and providing a detailed representation of the observed phenomena.

POPULATION

The study focused on parents of children with Autism Spectrum Disorder (ASD) in Gilgit-Baltistan who provide Applied Behavior Analysis (ABA) therapy to their children.

RESEARCH SAMPLE AND SAMPLING TECHNIQUE

The sample for this study consisted of 52 parents of children with Autism Spectrum Disorder (ASD) who provide Applied Behavior Analysis (ABA) therapy to their children. These parents reside in Gilgit-Baltistan. The sampling technique used was convenience sampling.

Research Tool

A Likert scale questionnaire was utilized to collect data from parents of children diagnosed with Autism Spectrum Disorder (ASD). The survey aimed to evaluate key aspects including social skills, daily living tasks (ADLs), and educational skills of children with ASD.

Data Collection Procedure

To gather data, the researcher developed a questionnaire consisting of 15 questions aimed at parents of children with Autism Spectrum Disorder (ASD) receiving Applied Behavior Analysis (ABA) therapy in Gilgit-Baltistan. The parents received the questionnaire through mail and WhatsApp. Parents completed the questionnaire based on their experiences, considering their child's growth following ABA therapy. The researcher implemented essential measures to ensure the reliability of the information provided by the parents.

VALIDITY AND DEPENDABILITY OF RESEARCH INSTRUMENT

The questionnaire was validated by four field experts in Special Education and Psychology. It focused on ASD-related social, daily living, and academic challenges. Pilot testing was done, and Cronbach's alpha was 0.804, indicating strong reliability.

DATA ANALYSIS

The gathered data was examined using advance statistic techniques via SPSS version 26. Frequencies and percentages were calculated to summarize the demographic data. To assess the relationship between categorical variables, the Chi-Square Test of Independence was utilized.

DESCRIPITIVE ANALYSIS

Table 1 Analysis at basic of demonstration

Sr No	variable	Group	Frequency	Percentage
1	**Gender**	Male	21	40.4%
		Female	31	59.6%
2	**Parents' age**			
		18-25	6	11.5%
		26-35	26	50.0%
		36-45	13	25.0%
		46-55	7	13.5%
3	**Education of parents**			
		FA/FSC	9	17.3%
		BA/BSC	19	36.5%
		MA/MSC	14	26.9%
		MPhil	7	13.5%
		PHD	3	5%

4	**Occupation of parents**			
		Healthcare prof	3	5.8%
		Educational prof	17	32.7%
		Technical workers	4	7.7%
		Others	2	53.8%
5	**Respondent's child age**			
		Below 5	22	42.3%
		6-10	18	34.6%
		11-15	8	15.4%
		16-20	4	7.7%
6	**Diagnostic age of Children**			
		Below 2	12	23.1%
		3-5 years	28	53.8%
		6-10	10	19.2%
		11 and above	2	3.8%
7	**Time Duration of Therapy**			
		Daily	11	21.2%
		1-2 times a week	22	42.3%
		3-4 times a week	19	36.5%

Table 1 summarizes participants' demographics. Of the respondents, 40.4% were male and 59.6% female. Age-wise, 11.5% were 18–25 years, 50.0% were 26–35, 25.0% were 36–45, and 13.5% were 46–55. Regarding education, 17.3% had FA/FSc, 36.5% BA/BSc, 26.9% MA/MSc, 13.5% MPhil, and 5.8% PhD. Occupationally, 5.8% were healthcare professionals, 32.7% educators, 7.7% technical/skilled workers, and 53.8% from other fields. Children's age distribution showed 42.3% were below 5 years, 34.6% aged 6–10, 15.4% aged 11–15, and 7.7% aged 16–20. Diagnosis age was below 2 years for 23.0%, 3–5 years for 53.8%, 6–10 years for 19.2%, and above 11 for 3.8%. Therapy frequency indicated 21.2% received daily sessions, 42.3% had therapy 1–2 times weekly, and 36.5% 3–4 times

Tbale.2: Descriptive statistics of statements

Statement	N	Min	Max	M	SD
My child has shown improvement in making eye contact After ABA therapy.	52	1.00	5.00	2.11	.89
ABA therapy has helped my child initiate and maintain Social Interaction.	52	1.00	5.00	2.15	.95
My child is now better at understanding and Responding to Emotions in others.	52	1.00	5.00	2.23	.87
My child engages in more appropriate play with Peers after receiving ABA therapy.	52	1.00	5.00	2.36	.88
Since starting ABA, my child's ability to follow social Rules and taking turns have improved.	52	1.00	5.00	2.36	.76
ABA therapy has helped my child become more Independent in Personal hygiene.	52	1.00	5.00	2.32	1.00
My child is better able to communicate their needs (e.g., asking for food, using the bathroom) Due to ABA intervention.	52	1.00	5.00	2.15	8.2
My child can now follow a structured daily routine With fewer Behavioral difficulties	52	1.00	5.00	2.40	.84
ABA therapy has improved my child's ability to Complete simple Household tasks independently.	52	1.00	5.00	2.38	.91
My child is more cooperative during meal times and other daily Activities after ABA therapy.	52	1.00	5.00	2.30	.82
ABA interventions have helped my child stay focused on Academic tasks for longer periods.	52	1.00	5.00	2.67	1.13
My child is now able to complete basic academic Tasks (e.g., writing, counting) more independently	52	1.00	5.00	2.75	1.13

My child has shown improvement in following multi-step Academic instructions with minimal guidance.	52	1.00	5.00	2.75	1.41
My child demonstrates increased confidence when attempting New academic task.	52	1.00	5.00	2.88	1.32
ABA interventions have enhanced my child's ability to transition Between academic activities with less resistance	52	1.00	5.00	2.73	1.03

The descriptive statistics in Table 2 show that the mean scores for all statements range between 2.11 and 2.88, indicating that most parents agreed or strongly agreed that ABA (Applied Behavior Analysis) therapy had a positive impact on their children. The lowest mean (M = 2.11) was for improvement in eye contact, suggesting a strong positive response. The highest mean (M = 2.88) was for increased confidence in academic tasks, which still reflects moderate agreement. Standard deviations (SD) show reasonable variation, with values generally below 1.5, indicating consistency in responses.

Table.3: Independent Samples t-test for Comparison of Autistic Child Parents Based on Gender

Variable	Gender	N	M	SD	df	T	Sig.(2-tailed)
Social skill	Male	21	2.0476	0.46002	50	-1.980	0.053
	Female	31	2.3806	0.67003			
Activities of Daily Living	Male	21	2.2762	0.54213	50	-0.392	0.696
	Female	31	2.3419	0.62438			
Academic Skills	Male	21	19.9524	1.35927	50	26.090	0.000
	Female	31	9.6129	1.43009			

Table 3 shows the results of an independent sample t-test comparing male and female parents of autistic children. No significant gender differences were found in Social Skills (t = -1.98, p = 0.053) or ADL (t = -0.39, p = 0.696). However, a significant difference was observed in Academic Skills, where male parents (M = 19.95) scored significantly higher than female parents (M = 9.61), t = 26.09, p = 0.000.

Table. 4: One-Way ANOVA for Differences in Mean Scores of Parents of Autistic Children Based on Age

		Sum of Squares	Df	Mean Square	F	Sig.
social skills	Between Groups	1.514	3	.505	1.378	.261
	Within Groups	17.575	48	.366		
	Total	19.089	51			
ADL	Between Groups	1.941	3	.647	1.979	.130
	Within Groups	15.687	48	.327		
	Total	17.628	51			
academic skills	Between Groups	147.186	3	49.062	1.826	.155
	Within Groups	1289.487	48	26.864		
	Total	1436.63	51			

Table 4 shows that there was no statistically significant difference among the responses regarding Social Skills, ADL, and Academic Skills based on age. For Social Skills, the F-value was 1.378 with a p-value of 0.261, indicating no significant difference ($p > 0.05$). For ADL, the F-value was 1.979 with a p-value of 0.130, suggesting no significant difference ($p > 0.05$). For Academic Skills, the F-value was 1.826 with a p-value of 0.155, showing no significant difference ($p > 0.05$).

Table. 5: One-Way ANOVA for Differences in Mean Scores of Parents of Autistic Children Based on Educational Qualifications

Factors		Sum,of Squares	df	Mean Square	F	Sig.
Social Skill	Between Groups	.224	4	.056	.139	.967
	Within Groups	18.865	47	.401		
	Total	19.089	51			
ADL	Between Groups	.991	4	.248	.700	.596
	Within Groups	16.636	47	.354		
	Total	17.628	51			
academic skills	Between Groups	160.792	4	40.198	1.481	.223
	Within Groups	1275.881	47	27.146		
	Total	1436.673	51			

Table 5 shows that there was no statistically significant difference among the responses regarding Social Skills, ADL, and Academic Skills based on the qualification of the parents of

Autistic children. For Social Skills, the F-value was 0.139 with a p-value of 0.967, indicating no significant difference ($p > 0.05$). For ADL, the F-value was 0.700 with a p-value of 0.596, suggesting no significant difference ($p > 0.05$). For Academic Skills, the F-value was 1.481 with a p-value of 0.223, showing no significant difference ($p > 0.05$).

Table. 6: One-Way ANOVA for Differences in Mean Scores of Parents of Autistic Children Based on Their Professions

		Sum of Squares	df	Mean Square	F	Sig.
social skills	Between Groups	.321	3	.107	.274	.844
	Within Groups	18.768	48	.391		
	Total	19.089	51			
ADL	Between Groups	.337	3	.112	.312	.817
	Within Groups	17.291	48	.360		
	Total	17.628	51			
Academic skills	Between Groups	211.635	3	70.545	2.764	.052
	Within Groups	1225.039	48	25.522		
	Total	1436.673	51			

Table 6 shows that there was no statistically significant difference among the responses regarding Social Skills, ADL, and Academic Skills based on the professions of parents of autistic children. For Social Skills, the F-value was 0.274 with a p-value of 0.844, indicating no significant difference ($p > 0.05$). For ADL, the F-value was 0.312 with a p-value of 0.817, suggesting no significant difference ($p > 0.05$). For Academic Skills, the F-value was 2.764 with a p-value of 0.052, showing a marginal difference that approached significance but was not statistically significant ($p > 0.05$).

Table.7: One-Way ANOVA for Differences in Mean Scores of Parents of Autistic Children Based on Their Child's Age Receiving Therapies

		Sum of Squares	df	Mean Square	F	Sig.
social skills	Between Groups	.220	3	.073	.186	.905
	Within Groups	18.869	48	.393		
	Total	19.089	51			
ADL	Between Groups	.497	3	.166	.464	.709
	Within Groups	17.131	48	.357		
	Total	17.628	51			
Academic skills	Between Groups	95.344	3	31.781	1.137	.343
	Within Groups	1341.330	48	27.944		
	Total	1436.673	51			

Table 7 shows that there was no statistically significant difference among the responses regarding Social Skills, ADL, and Academic Skills based on the child's age receiving therapies, as reported by parents of autistic children. For Social Skills, the F-value was 0.186 with a p-value of 0.905, indicating no significant difference ($p > 0.05$). For ADL, the F-value was 0.464 with a p-value of 0.709, suggesting no significant difference ($p > 0.05$). For Academic Skills, the F-value was 1.137 with a p-value of 0.343, showing no significant difference ($p > 0.05$).

Table.8: One-Way ANOVA for Differences in Mean Scores of Parents of Autistic Children Based on Their Child's Duration of Therapy

		Sum of Squares	df	Mean Square	F	Sig.
social skills	Between Groups	1.381	2	.690	1.911	.159
	Within Groups	17.708	49	.361		
	Total	19.089	51			
ADL	Between Groups	.032	2	.016	.044	.957
	Within Groups	17.596	49	.359		
	Total	17.628	51			
Academic skills	Between Groups	200.360	2	100.180	3.971	.025
	Within Groups	1236.313	49	25.231		
	Total	1436.673	51			

Table 8 shows that there was no significant difference in Social Skills ($F = 1.911$, $p = 0.159$) and ADL ($F = 0.044$, $p = 0.957$) based on the child's duration of therapy. However, a significant difference was found in Academic Skills ($F = 3.971$, $p = 0.025$), indicating that therapy duration had a meaningful effect on academic outcomes. LSD post hoc analysis revealed that parents whose children received therapy daily scored significantly higher in academic skills than those whose children received therapy one to two times a week (Mean Difference = 3.77, $p = 0.047$). Similarly, children receiving therapy three to four times a week also showed significantly higher academic scores compared to the one to two times a week group (Mean Difference = 4.08, $p = 0.013$). No significant post hoc differences were found in Social Skills and ADL ($p > 0.05$).

Summary:

This study employed a quantitative and descriptive research design to investigate the impact of Applied Behavior Analysis (ABA) therapy on children with Autism Spectrum Disorder (ASD) in Gilgit-Baltistan, as perceived by their parents. The research focused on evaluating improvements in social skills, activities of daily living (ADLs), and academic skills among children receiving ABA therapy. The study population consisted of 52 parents of children with ASD, selected through convenience sampling. Data was collected using a Likert scale questionnaire comprising 12 questions, distributed via mail and WhatsApp. The questionnaire's reliability was confirmed with a Cronbach's Alpha score of 0.804, and its validity was established through expert evaluation from the fields of Special Education and Psychology. Data analysis was conducted using SPSS

version 26, employing descriptive statistics (frequencies and percentages), independent samples t-tests, and one-way ANOVA to explore relationships between variables.

The demographic profile revealed that 59.6% of respondents were female, and 50.0% were aged 26–35 years. Most parents held a BA/BSc degree (36.5%), and 53.8% were employed in fields other than healthcare, education, or technical work. The majority of children (42.3%) were below 5 years old, with 53.8% diagnosed with ASD between 3–5 years. Therapy frequency varied, with 42.3% receiving sessions 1–2 times per week.

Findings

Descriptive Analysis

- **Social Skills**: Parents reported moderate improvements in social abilities, with mean scores ranging from 2.11 (eye contact) to 2.36 (following social rules and appropriate play). Standard deviations (0.76–0.95) indicated consistent responses.
- **Activities of Daily Living (ADLs)**: Improvements were noted in independence in personal hygiene (M = 2.32, SD = 1.00), communication of needs (M = 2.15, SD = 0.82), and adherence to daily routines (M = 2.40, SD = 0.84).
- **Academic Skills**: Parents observed moderate progress in academic tasks, with mean scores ranging from 2.67 (focus on academic tasks) to 2.88 (confidence in attempting new tasks). Higher standard deviations (1.03–1.41) suggested variability in perceived academic improvements.

Inferential Analysis

- **Gender-Based Differences (Independent Samples t-test)**: No significant differences were found between male and female parents in perceptions of social skills ($p = 0.053$) or ADLs ($p = 0.696$). However, a significant difference was observed in academic skills ($p = 0.000$), with male parents reporting higher mean scores (M = 19.95) than female parents (M = 9.61).
- **Age-Based Differences (One-Way ANOVA)**: No significant differences were found in social skills ($p = 0.261$), ADLs ($p = 0.130$), or academic skills ($p = 0.155$) based on parents' age.
- **Education-Based Differences (One-Way ANOVA)**: Parental education levels showed no significant impact on perceptions of social skills ($p = 0.967$), ADLs ($p = 0.596$), or academic skills ($p = 0.223$).
- **Profession-Based Differences (One-Way ANOVA)**: No significant differences were observed in social skills ($p = 0.844$) or ADLs ($p = 0.817$). Academic skills showed a marginal difference ($p = 0.052$), suggesting a potential influence of profession that warrants further investigation.
- **Child's Age-Based Differences (One-Way ANOVA)**: The age of children receiving therapy had no significant effect on social skills ($p = 0.905$), ADLs ($p = 0.709$), or academic skills ($p = 0.343$).
- **Therapy Duration-Based Differences (One-Way ANOVA)**: Therapy duration significantly affected academic skills ($p = 0.025$), with daily and 3–4 times weekly sessions linked to higher academic scores compared to 1–2 times weekly sessions. No significant differences were found in social skills ($p = 0.159$) or ADLs ($p = 0.957$).

Conclusion:

The study provides evidence that ABA therapy is perceived by parents as moderately effective in improving social skills, ADLs, and academic skills among children with ASD in Gilgit-Baltistan. The significant impact of therapy duration on academic skills suggests that more frequent sessions (daily or 3–4 times weekly) may enhance academic outcomes. The lack of significant
Differences based on parents' age, education, profession, or child's age indicates that ABA therapy's perceived effectiveness is relatively consistent across these demographics. However, the notable gender-based difference in academic skill perceptions requires further exploration to understand underlying factors, such as potential biases or differences in parental involvement.

Recommendations

1. **Increase Therapy Frequency**: Stakeholders, including therapists and policymakers, should prioritize increasing the frequency of ABA therapy sessions to at least 3–4 times per week to maximize academic skill development.
2. **Targeted Support for Parents**: Training programs should be developed to address potential gender-based differences in perceptions, ensuring both male and female parents have equal access to resources and support to evaluate their child's progress accurately.
3. **Expand Access to ABA Therapy**: Given the moderate improvements across social, daily living, and academic domains, efforts should be made to make ABA therapy more accessible in Gilgit-Baltistan, particularly for families with limited resources.
4. **Further Research**: Future studies should explore the reasons behind gender-based differences in academic skill perceptions and investigate the marginal effect of parental profession on academic outcomes. Longitudinal studies could also assess the long-term impact of ABA therapy.
5. **Enhance Questionnaire Distribution**: To improve response rates and data diversity, alternative distribution methods (e.g., in-person or online platforms beyond WhatsApp) could be explored to reach a broader sample.

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