Goal Attainment Scaling and Quality of Life of Autistic Children Receiving Speech and Language Therapy in a Higher Educational Institution in the Philippines

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ABSTRACT

Objectives. This study aimed to describe the demographic profile, intervention sessions, goal attainment scaling (GAS), and health-related quality of life (HRQOL) of autistic children receiving speech and language therapy (SLT) in a higher educational institution in the Philippines.

Methods. Deidentified data from 18 autistic children aged 4–16 years (mean=8.2; SD=2.9) who received SLT for two months were analyzed. Their demographic profile, intervention sessions, GAS scores, and generic HRQOL scores were documented.

Results. Most participants were school-age children (n=12; 66%) and were boys (n=14; 78%). After two months, the GAS scores of 11 participants (61%) increased by 1–2 points, whereas the scores of the remaining participants decreased (n=6; 33%) or did not change (n=1; 6%). Their mean generic HRQOL scores before and after SLT were 65.6 (SD=15.2) and 61.2 (SD=17.4), respectively.

Conclusions. While the GAS scores increased for most participants, their generic HRQOL scores did not show clinically significant changes after two months of SLT. This can be attributed to the few therapy sessions and short follow-up period. The findings highlight the need to provide long-term support to SLT services of autistic children in the Philippines to document more desirable quality of life outcomes.

Keywords: quality of life, autism, children, speech and language therapy

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INTRODUCTION

Autism spectrum disorder (ASD) is a neurodevelopmental condition characterized by difficulties in social interaction and communication as well as restricted, repetitive behaviors.[1] It affects about one in 100 children globally[2] and is four times more likely to affect boys than girls.[3] In the Philippines, there are currently no epidemiologic studies estimating the prevalence of autism,[4] but a narrative review in 2012 reported that around 500,000 Filipino children had autism.[5] According to the World Report on Disability in 2011, noncommunicable chronic conditions – including autism – account for 67% of all years lived with disability in low-to-middle income countries like the Philippines.[6]

Autistic children often show patterns of language use and behavior such as repetitive or rigid language, uneven

language development, and poor nonverbal conversation skills which affect their ability to communicate and interact with others.[7] They also had significantly lower health-related quality of life (HRQOL) when compared to their typically developing peers.[8,9] This lower quality of life was attributed to factors such as social skills impairment,[10] autism traits and executive functioning deficits,[11] and problems with emotion processing.[12]

Due to their complex communication needs, autistic children require access to various educational, healthcare, habilitation, and rehabilitation services. Speech and language therapy (SLT) is one way to address these children's communication needs. It is a form of behavioral intervention that targets specific speech and language skills to facilitate effective communication. Systematic reviews documenting the effects of SLT on autism reported the use of behavioral interventions (e.g., pragmatic language intervention and social skills training) to improve the communication skills of children.[13–15] Previous studies also suggest that improving these communication skills may be associated with better quality of life among autistic children.[10,16]

The clinical and patient-reported outcomes of individuals receiving SLT services are not well documented in the Philippines. Due to the limited access to valid normative data and assessment tools, speech-language pathologists (SLPs) tend to rely on Western-made tests which pose reliability and validity issues in practice.[17] In addition, healthcare databases in clinical settings, if present, are not designed to systematically collect and process intervention findings across patients. Coupled with ethical and data privacy issues, the current state of practice makes it difficult for SLPs to document management and outcome data among autistic children. This could explain why there are no published studies that report the HRQOL of autistic children receiving SLT in the Philippines.

This study aimed to describe the demographic profile, intervention sessions, goal attainment scaling (GAS) scores, and generic HRQOL scores of autistic children who received SLT services in a higher educational institution in the Philippines. Documenting their HRQOL scores before and after receiving SLT may address the identified evidence gaps. Patient-reported outcomes, such as HRQOL, are one of the ways to measure the quality and success of therapy services from the perspective of autistic children and their families.[18]

MATERIALS AND METHODS

Study Design

This case series analyzed the available management and outcome data from an electronic healthcare registry which included 18 autistic children who received SLT services in the Philippines. De La Salle Medical and Health Sciences Institute (DLSMHSI) is a higher education institution offering free SLT services to individuals with communication needs through the clinical practicum courses of the Bachelor of Science in Speech and Language Pathology (BSSLP) program. During the clinical practicum, BSSLP interns (4th year students) provide virtual SLT sessions under the supervision of registered SLPs. In 2022, an electronic healthcare registry was developed and implemented in the College of Rehabilitation Sciences (CRS) Speech Clinic, a pediatric therapy center managed by the Speech and Language Pathology (SLP) Department of DLSMHSI.

Population and Sampling

All children aged 2–18 years old who were receiving SLT services in the CRS Speech Clinic were invited to enroll in the registry and participate in the study. Eligible participants, whose parents or legal guardians provided informed consent, were enrolled in the registry by the interns and clinical supervisors. Upon successful enrollment to the registry, the lead clinical supervisor assigned each participant to their interns. The registry served as the platform for collecting, storing, and retrieving data of patients in the CRS Speech Clinic.

This study included deidentified data from Filipino children aged 2–18 years diagnosed with autism receiving SLT at the CRS Speech Clinic and enrolled in the registry from September–October 2022. Data from children with indefinite diagnoses and co-occurring neurodevelopmental conditions (e.g., Down's syndrome, attention deficit-hyperactivity disorder, hearing impairment) were excluded.

Data Collection

The interns scheduled appointments with the participants to conduct baseline outcome assessment. The Goal Attainment Scale (GAS)[19] and the Pediatric Quality of Life Inventory™ (PedsQL) 4.0 Generic Core Scales[20] were used as outcome measures. To ensure reliability and validity, the descriptions for each increment of the GAS rating scales were standardized. These standard descriptions were validated by a consensus panel composed of stakeholder representatives (i.e., SLPs and clinical supervisors) through a series of Delphi surveys. Although the descriptions for the GAS rating scales were standardized, the clinicians still had to indicate the target stimuli for each goal (see Appendix). Next, the interns and clinical supervisors were trained in using both tools, which were administered before commencing the SLT sessions. The baseline scores were then encoded in the registry.

After baseline measurement, the children were scheduled for SLT sessions based on the recommendations of the clinical supervisor. The therapy sessions were highly individualized and varied depending on the child's skills, needs, and resources. These sessions reflected the intervention protocol received by children for one clinical rotation (i.e., two months) in accordance with the clinical training manual of CRS Speech Clinic. The sessions were conducted virtually using Zoom videoconferencing platform either once or twice a week, depending on the recommendations of the

clinical supervisor. Their weekly SLT sessions lasted for 30–45 minutes, with another five minutes allotted for parent/caregiver feedback. When the participants cannot attend the session virtually, the SLT activities were done asynchronously. The interns and clinical supervisors provided instructional videos together with therapy materials to serve as guides for parents and caregivers when doing the activities at home.

Each therapy session was documented in the registry (e.g., session date, intervention goals, and clinician notes). The data entries were encoded by the interns and were validated by their respective clinical supervisors. After two months of receiving SLT, a different set of outcome assessors readministered GAS and PedsQL for each participant.

The registry was used to extract deidentified data on demographics, intervention sessions, GAS scores, and PedsQL scores of eligible participants into spreadsheets. The spreadsheets were manually checked for missing or erroneous data entries. Management and outcome data from each spreadsheet were matched using the registry reference codes and combined into one data set for analysis.

Data Analysis

Descriptive statistics were used to summarize the participants' demographic profile and intervention sessions. The differences in the GAS scores from baseline were also determined after two months of SLT for each participant. A bar graph was used to visually present the median of these differences which ranged from –2 to +2. Negative values indicate a reduction in GAS scores when compared to baseline, while positive values indicate an increase in scores. Zero denotes no change in GAS scores before and after SLT. Means and standard deviations of HRQOL scores were reported by sex and by age group: preschool (2–5 years), school age (6–11 years), adolescent (12–18 years). All these statistical data summaries and graphs were done in Stata/MP 14.0.[21]

Ethical Considerations

This study was approved by the University of the Philippines Manila Research Ethics Board for implementation (UPMREB 2021-0706-01). Adequate data protection of the registry participants and compliance with ethical standards were ensured throughout this study. The informed consent form signed by the participants when they enrolled in the registry included a statement that the patient data may be used in future research studies such as this one if anonymity is maintained.

Community Involvement

Parents and SLPs of autistic children were involved in designing and implementing this research project. Specifically, they were consulted during the systems development of the electronic healthcare registry used in this study. Furthermore, their insights and feedback were regularly obtained to further improve the registry's data collection procedures.

RESULTS

Participant Characteristics

Of the 30 invited patients from the CRS Speech Clinic between September–October 2022, 29 (97%) agreed to participate and were enrolled in the registry. One parent refused to participate due to undisclosed reasons. Eighteen of the registry participants (62%) were diagnosed with autism. Their mean age was 8.2 years (SD: 2.9; range: 4–16). Most participants were school-age children (n=12; 66%) and were boys (n=14; 78%). The severity of autism for all participants was not specified/reported in their referral forms or medical records. Mothers of autistic children served as the primary caregiver for all participants (Table 1). Most participants had concerns with expressive (n=15, 83%) and receptive (n=12, 66%) language skills. All participants have been receiving SLT for at least two months from the same clinic prior to the study. Other forms of intervention received by the participants during the study period were not documented. Although data on the socio-economic status of the participants was not specifically collected, most clients in the CRS Speech Clinic come from low-to-middle income families in Cavite and neighboring areas in Region IV-A.

Speech and Language Therapy Sessions

On average, the participants received five (range: 4–7) virtual SLT sessions once a week between September–October 2022. All participants attended at least three synchronous sessions with their parents/caregivers. The SLT activities of interns and clinical supervisors focused on facilitating skills to achieve the target communication goals set at the beginning

Table 1. Characteristics of Participants Diagnosed with Autism Aged 2–18 Years (N=18)

Participant characteristics	
Age in years, mean (SD)	8.2 (2.9)
Age range in years	4–16
Age group, n (%)	
2–5 years (preschool)	3 (17)
6–11 years (school-age)	12 (66)
12–18 years (adolescents)	3 (17)
Sex, n (%)	
Male	14 (78)
Female	4 (22)
Severity of autism, n (%)	
Not specified/reported	18 (100)
Primary caregiver, n (%)	
Mother	18 (100)
Speech-language concerns, n (%)	
Expressive language	15 (83)
Receptive language	12 (66)
Speech production	2 (11)
Communication modalities	2 (11)
Cognitive aspects of communication	1 (6)
Pre-linguistic communication	1 (6)

SD: standard deviation

of the study. Improving receptive and expressive language served as a common goal for all participants (n=18; 100%). The interns developed individualized therapy activities for language development. They targeted identification (receptive semantics; n=9; 50%) and naming (expressive semantics; n=2; 11%) of concepts and vocabulary associated with action words, common objects used in activities of daily living, adjectives, quantity, and location.

Aside from vocabulary, the interns also provided listening activities to improve auditory comprehension through following commands and processing questions (receptive syntax; n=1; 6%). For school-age children, more complex language skills were facilitated such as formulation of complete sentences, sequencing, retelling of stories (expressive syntax; n=7; 39%), labeling of feelings and emotions, problem-solving, and cause-effect relationships (expressive semantics; n=2; 11%). In some instances, social aspects of communication (n=1; 6%) such as topic initiation and maintenance were also practiced.

Some participants had difficulty articulating specific speech sounds such as /l/ and /r/ (articulation; n=2; 11%). The interns used a combination of motor-based (e.g., phonetic placement, oral motor exercises) and language-based (e.g., phonological contrast) approaches to improve speech production. For children with limited verbal outputs, alternative/augmentative communication was used to facilitate functional communication (communication modalities; n=2; 11%).

Goal Attainment Scaling

The interns and the clinical supervisors formulated two-to-three GAS rating scales for each participant. These rating scales served as surrogate measures for functional communication. When compared to baseline, the median of the differences in GAS scores for most participants (n=11; 61%) increased by one or two points after two months of SLT, while it decreased (n=6; 33%) or remained the same (n=1; 6%) for the rest (Figure 1).

Generic Health-Related Quality of Life (measured by PedsQL 4.0)

All PedsQL 4.0 Generic Core Scale forms were completed by parents or caregivers who served as proxies to autistic children. The mean total scores at baseline and at follow-up were 65.6 (SD=15.2; Table 2) and 61.2 (SD=17.4; Table 3), respectively. When compared to baseline, there was a small and not clinically significant reduction in the generic HRQOL scores of the participants after two months of SLT.

The HRQOL scores of preschool children (aged 2–5 years) at baseline (mean=75; SD=11.8; Table 2) and at follow-up (mean=71; SD=15.6; Table 3) were slightly higher when compared to older children. When grouped according to sex, boys appeared to have higher HRQOL scores at baseline (mean=70.7; SD=12.3; Table 2) and at follow-up (mean=65.6; SD=17; Table 3) when compared to girls. However, it should be noted that most of the participants were boys (n=14; 78%).

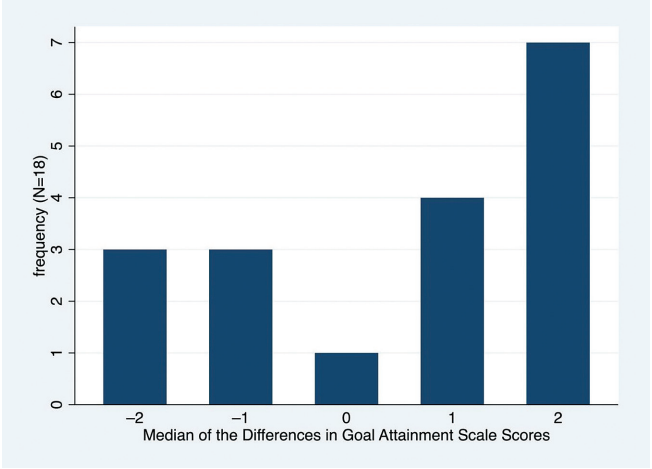

Figure 1. Median of the differences in the goal attainment scale scores of autistic children aged 2–18 years after two months of speech and language therapy (N=18).

Among the four domains of PedsQL 4.0 for all participants, social functioning had the lowest score (mean=51.9; SD=25.3) at baseline (Table 2). The same domain showed an increase of 4.2 points after two months of SLT (mean=56.1; SD=28.1; Table 3). This increase in social functioning scores at follow-up were also observed for children aged 6–11 years and for boys. Physical and school functioning scores were reduced across all age groups and sexes after therapy, whereas the emotional functioning scores remained similar.

DISCUSSION

Previous studies conducted among autistic children in Asia reported similar demographic profiles with the study participants. Younger autistic children aged 2–11 years also comprised most of the participants in cross-sectional studies conducted in India (n=41; 75%)[22] and Malaysia (n=320; 97%).[23] Higher proportions of male (72–83%) versus female participants were likewise observed in these studies.[22–25] These findings suggest that younger children, especially boys, are seen more often in facilities catering to the autistic population, highlighting the importance of early diagnosis and intervention.[26,27] Regardless of age and sex, comprehensive support services need to be provided to autistic children. A survey in the Philippines reported that 42% (n=67) of parents had received subsidized consultation and intervention services for their autistic children,[4] like the SLT services offered in DLSMHSI. Expanding the coverage and access to these services may benefit autistic children in low-to-middle income countries such as the Philippines.

The PedsQL 4.0 Generic Core Scale total scores of 18 autistic children in the Philippines at baseline (mean=65.6; SD=15.2) and at follow-up (mean=61.2; SD=17.4) were comparable to the mean scores reported by a longitudinal

Table 2. PedsQL 4.0 Generic Core Scale Scores of Autistic Children Aged 2–18 Years at Baseline (N=18)

	Physical Functioning Mean (SD)	Emotional Functioning Mean (SD)	Social Functioning Mean (SD)	School Functioning Mean (SD)	Total Score Mean (SD)
All participants (N=18)	71.8 (17.6)	65.8 (16.8)	51.9 (25.3)	63.1 (23.8)	65.6 (15.2)
Age Group					
2 to 5 years (n=3)	77.0 (7.5)	75.0 (10)	71.7 (20.2)	74.0 (29.5)	75.0 (11.8)
6 to 11 years (n=12)	70.7 (15.4)	65.0 (14.9)	45.8 (25)	59.5 (23.5)	63.4 (12.2)
12 to 18 years (n=3)	71.0 (34.8)	60.0 (30)	56.7 (27.5)	66.7 (25.2)	64.7 (29)
Sex					
Boys (n=14)	77.3 (13)	69.6 (14.9)	57.5 (25.3)	66.9 (25.2)	70.7 (12.3)
Girls (n=4)	52.5 (19.5)	52.5 (18.5)	32.5 (14.4)	50.0 (12.2)	47.5 (9.9)

SD: standard deviation

Table 3. PedsQL 4.0 Generic Core Scale Scores of Autistic Children Aged 2–18 years after Receiving Speech and Language Therapy for Two Months (N=18)

	Physical Functioning Mean (SD)	Emotional Functioning Mean (SD)	Social Functioning Mean (SD)	School Functioning Mean (SD)	Total Score Mean (SD)
All participants (N=18)	63.5 (17.1)	66.1 (19.6)	56.1 (28.1)	54.4 (24.1)	61.2 (17.4)
Age Group					
2 to 5 years (n=3)	71.0 (16.1)	75.0 (13.2)	68.3 (17.6)	71.7 (24.7)	71.0 (15.6)
6 to 11 years (n=12)	61.3 (17.1)	65.4 (20.8)	57.5 (30.9)	50.0 (25)	60.2 (17.8)
12 to 18 years (n=3)	64.7 (21.8)	60.0 (22.9)	38.3 (20.8)	55.0 (18)	55.7 (19.6)
Sex					
Boys (n=14)	67.5 (16.5)	69.3 (20.5)	62.9 (26.8)	57.1 (26.5)	65.6 (17)
Girls (n=4)	49.5 (11.8)	55.0 (12.2)	32.5 (20.2)	45.0 (9.1)	45.8 (3.8)

SD: standard deviation

study in the United States among autistic children at baseline (mean=65.0; SD=15.8; N=4910) and at follow-up after 4.7 years (mean=65.0; SD=15.4; N=2722).[28] When compared to typically developing children in Greece (mean=88.7; SD=11.5), autistic children had significantly lower mean HRQOL scores (mean=65.7; SD=17.6).[29] Social functioning also had the lowest score (mean=54; SD=24.8) across all domains of PedsQL among autistic children in Greece.[29] This is comparable to the social functioning scores of the participants in this study at baseline (mean=51.9; SD=25.3). Autistic children appear to have a significantly lower quality of life when compared to their typically developing peers, with social functioning being affected the most.[29] In this study, the social functioning scores of the participants increased after receiving SLT for two months. Future studies may further investigate this association and its overall impact on the HRQOL of autistic children.

On average, there was a small and not clinically significant reduction in the generic HRQOL scores from baseline among 18 autistic children after two months of SLT. This can be attributed to the small number of therapy sessions received by the participants (i.e., 4–7 sessions) and the short follow-up period (i.e., two months), following the clinical training manual of CRS Speech Clinic for one rotation. Since the intervention period for children with speech and language impairments tend to be protracted for years,[30] the changes in HRQOL scores may become more apparent if the participants had received more SLT sessions and were observed for longer intervention periods.

Despite not showing clinically significant changes in the generic HRQOL scores of autistic children in this study, the median of the differences in GAS scores for most participants (n=11; 61%) increased by one or two points after receiving SLT. This suggests that the individualized intervention goals set by the clinicians were achieved by most participants after two months. While SLT sessions may enhance the communication skills of autistic children, these improvements may not immediately translate to changes in generic HRQOL due to its complex and multifaceted nature.[31] The use of GAS as a surrogate outcome measure for functional communication could also explain these findings. Without a valid tool for measuring the effects of SLT on functional communication, Filipino SLPs will continue to rely on Western-made tests which pose limitations in measuring and documenting changes in the functional outcomes of autistic children.[17]

The intervention goals set by the interns and their clinical supervisors might not immediately affect the generic HRQOL of the participants. Most goals focused on addressing speech and language impairments of the participants. Considering that generic HRQOL is a multifaceted construct,[31] shifting the focus to a biopsychosocial approach by addressing not only impairments but also activity limitations and participation restrictions[32] may result in better HRQOL scores of autistic children. It should also be noted that the PedsQL forms were

all completed by parents or caregivers who served as proxies to their children, which may differ from the perceived quality of life of the participants. Furthermore, PedsQL was used as an alternative outcome measure in the absence of a valid tool for communication-related HRQOL among Filipino children.

Adapting a more holistic approach to intervention through the biopsychosocial model may also result in changes in the practice patterns of the clinicians.[32] The SLT activities of the interns and their clinical supervisors aimed to address the participants' clinical impairments. As such, they prepared therapy activities and materials for improving communication skills which may not immediately generalize to functional contexts and health outcomes. Integrating the International Classification of Functioning, Disability and Health (ICF) framework in goal setting may lead to intervention practices which address not only speech and language impairments but also activity limitations and participation restrictions of autistic children.[32] The study results may be used by the SLP Department of DLSMHSI as a reference to enact changes in BSSLP courses and clinical practicum for better integration of the ICF's biopsychosocial framework in clinical education and practice.

Recommendations for Future Research

The small number of children studied, short follow-up period, impairment-focused intervention goals, and use of surrogate outcome measures are the main limitations of this study. To address these, future studies may include a larger sample of autistic children focusing on a specific age range (e.g., preschool children) and clinical profile (e.g., expressive and receptive language concerns). Registry implementation may also be continued by the SLP Department to facilitate long-term follow-up of the study cohort. With the registry systems in place, longitudinal analysis of management and outcome data of the participants (e.g., after six months or one year) becomes more feasible. Aside from autism, the management and outcome data of registry participants with other developmental conditions such as intellectual disability, cerebral palsy, and Down syndrome may also be analyzed in future studies. To increase participant accrual, expansion of the registry implementation and inclusion of patients receiving SLT from other clinics affiliated with DLSMHSI may be done. Finally, adequate resources should be allotted by the SLP Department for each academic year to ensure sustainability of registry implementation and data collection.

Since there are no valid tools available for measuring functional communication and communication-related HRQOL, identifying relevant outcomes and indicators for measuring success of SLT sessions among autistic children and their families may be conducted in future studies. After which, local outcome measures or tools (e.g., ordinal scales, self-report questionnaires) may be developed to specifically measure changes in functional communication and HRQOL of autistic children receiving SLT. Outcome measures such as the Functional Communication Measures[33] and the Quality of Communication Life Scale[34] may be used as references in developing these tools. The psychometric properties of these local outcome measures also need to be established by evaluating their reliability and validity among autistic children in the Philippines. Publication and dissemination of these tools are necessary to improve the documentation practices of SLPs in the country and to ensure the quality of SLT services that they are providing to their patients.

Recommendations for Practice and Policy

The study results highlight the need to reevaluate practices for SLT intervention planning and clinical education. Instead of focusing on speech and language impairments, SLPs may target outcomes that are relevant and meaningful to patients. To do this, they need to further enhance the participation of patients and their families in goal setting and intervention planning. Furthermore, parent/caregiver engagement should also be maximized during the sessions to facilitate generalization of skills in functional contexts (e.g., at home or in school). By doing so, SLT sessions may address not only the speech and language impairments but also the activity limitations and participation restrictions of patients. This results in a more holistic intervention, in line with the biopsychosocial approach of the ICF framework,[32] which may consequently improve the functional communication and HRQOL of these patients.

These recommendations in practice may also be translated to the clinical education of BSSLP students in DLSMHSI. The SLP Department may add measures in their standard operating procedures to ensure that interns and clinical supervisors apply and adhere to the biopsychosocial framework when facilitating SLT sessions. In addition, faculty members may also evaluate how this approach can be better integrated in the curriculum, course syllabi, teaching-learning activities, and student assessment of professional courses. Limitations in clinical practice brought about by the lack of validated outcome measures for functional communication and communication-related HRQOL should also be highlighted among students and faculty members. This may eventually encourage them to generate faculty and undergraduate research studies to address these gaps.

The results and recommendations from this study may be used by stakeholders and policymakers to further expand the access of autistic children to SLT services in the country. In the Philippines, the financial coverage for children with developmental disabilities, including autism, is only PHP 5,000 per annum.[35] Considering that each session of SLT costs PHP 500 on average,[4] the coverage may provide for a maximum of 10 SLT sessions for an autistic child. However, since the intervention of autistic children tend to be protracted for years,[30] the coverage may have to be expanded to cover more than 10 sessions in one year. In addition, the coverage only includes Western-made assessment tools for evaluating speech and language impairment, but these tools have not been validated for the Filipino population. Outcome measures

for functional communication and HRQOL are not included in the coverage. Considering the importance of using patient-reported outcomes in intervention, these measures may also be added.

CONCLUSIONS

The mean generic HRQOL scores of 18 autistic children showed a small and not clinically significant reduction after two months of SLT. The median of the differences in goal attainment scale scores of 61% of the participants increased by one or two points, suggesting an improvement in the communication skills of most participants.

Although SLT sessions may improve the communication skills of autistic children, these improvements may not immediately translate to clinically significant changes in HRQOL considering its complex and multifaceted nature. Increasing the number of SLT sessions and duration of follow-up, adapting a holistic approach to intervention, and using valid outcome measures for functional communication and communication-related HRQOL may be used in future studies involving a larger group of children. To document more desirable outcomes in their quality of life, this study highlights the need to conduct further research and enact changes in practice and policies that will provide long-term support to SLT services of autistic children in the Philippines.

Data Availability Statement

The datasets generated and/or analyzed in this study are available from the corresponding author on reasonable request.

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Statement of Authorship

All authors certified fulfillment of ICMJE authorship criteria.

Author Disclosure

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APPENDIX

Standardized Rating Scales for Goal Attainment Scaling

Version: 5
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Delphi Survey Round 1: February 10 to February 24, 2022
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Goal Attainment Scale (GAS)

ASHA's The Big Nine

1. Articulation
2. Fluency
3. Voice and resonance (including respiration and phonation)
4. Receptive and expressive language
5. Hearing (including the impact on speech and language)
6. Swallowing (oral, pharyngeal, esophageal, and related functions, including oral function for feeding; orofacial myofunction)
7. Cognitive aspects of communication (attention, memory, sequencing, problem-solving, executive functioning)
8. Social aspects of communication (challenging behavior, ineffective social skills, lack of communication opportunities)
9. Communication modalities (including oral, manual, augmentative and alternative communication techniques, and assistive technologies)

1. ARTICULATION

1.1. Speech Production

Score	Standard Descriptions
-2	The client produced [target phoneme, word, phrase, or sentence] in [isolation, syllables, initial/medial/final/all word positions, phrases, sentences, or discourse] with 0-20% accuracy spontaneously.
-1	The client produced [target phoneme, word, phrase, or sentence] in [isolation, syllables, initial/medial/final/all word positions, phrases, sentences, or discourse] with 21-40% accuracy spontaneously.
0	The client produced [target phoneme, word, phrase, or sentence] in [isolation, syllables, initial/medial/final/all word positions, phrases, sentences, or discourse] with 41-60% accuracy spontaneously.
+1	The client produced [target phoneme, word, phrase, or sentence] in [isolation, syllables, initial/medial/final/all word positions, phrases, sentences, or discourse] with 61-80% accuracy spontaneously.
+2	The client produced [target phoneme, word, phrase, or sentence] in [isolation, syllables, initial/medial/final/all word positions, phrases, sentences, or discourse] with 81-100% accuracy spontaneously.

1.2. Speech Intelligibility

Score	Standard Descriptions
-2	The client produced [target word, phrase, or sentence] with 0-20% intelligibility rating by [a familiar or an unfamiliar] listener spontaneously.
-1	The client produced [target word, phrase, or sentence] with 21-40% intelligibility rating by [a familiar or an unfamiliar] listener spontaneously.
0	The client produced [target word, phrase, or sentence] with 41-60% intelligibility rating by [a familiar or an unfamiliar] listener spontaneously.
+1	The client produced [target word, phrase, or sentence] with 61-80% intelligibility rating by [a familiar or an unfamiliar] listener spontaneously.
+2	The client produced [target word, phrase, or sentence] with 81-100% intelligibility rating by [a familiar or an unfamiliar] listener spontaneously.

2. FLUENCY

Score	Standard Descriptions
-2	The client produced fluent speech 0-20% of the time spontaneously.
-1	The client produced fluent speech 21-40% of the time spontaneously.
0	The client produced fluent speech 41-60% of the time spontaneously.
+1	The client produced fluent speech 61-80% of the time spontaneously.
+2	The client produced fluent speech 81-100% of the time spontaneously.

3. VOICE AND RESONANCE

3.1. Respiration

Score	Standard Descriptions
-2	The client expired [target volume] liters of air in [target duration] seconds 0-20% of the time spontaneously.
-1	The client expired [target volume] liters of air in [target duration] seconds 21-40% of the time spontaneously.
0	The client expired [target volume] liters of air in [target duration] seconds 41-60% of the time spontaneously.
+1	The client expired [target volume] liters of air in [target duration] seconds 61-80% of the time spontaneously.
+2	The client expired [target volume] liters of air in [target duration] seconds 81-100% of the time spontaneously.

3.2. Vocal Quality

Score	Standard Descriptions
-2	The client produced appropriate vocal quality in relation to age, sex, gender, body build, and culture 0-20% of the time spontaneously.
-1	The client produced appropriate vocal quality in relation to age, sex, gender, body build, and culture 21-40% of the time spontaneously.
0	The client produced appropriate vocal quality in relation to age, sex, gender, body build, and culture 41-60% of the time spontaneously.
+1	The client produced appropriate vocal quality in relation to age, sex, gender, body build, and culture 61-80% of the time spontaneously.
+2	The client produced appropriate vocal quality in relation to age, sex, gender, body build, and culture 81-100% of the time spontaneously.

3.3. Vocal Pitch

Score	Standard Descriptions
-2	The client produced appropriate vocal pitch in relation to age, sex, gender, body build, and culture 0-20% of the time spontaneously.
-1	The client produced appropriate vocal pitch in relation to age, sex, gender, body build, and culture 21-40% of the time spontaneously.
0	The client produced appropriate vocal pitch in relation to age, sex, gender, body build, and culture 41-60% of the time spontaneously.
+1	The client produced appropriate vocal pitch in relation to age, sex, gender, body build, and culture 61-80% of the time spontaneously.
+2	The client produced appropriate vocal pitch in relation to age, sex, gender, body build, and culture 81-100% of the time spontaneously.

3.4. Vocal Loudness

Score	Standard Descriptions
-2	The client produced appropriate vocal loudness in relation to age, sex, gender, body build, and culture 0-20% of the time spontaneously.
-1	The client produced appropriate vocal loudness in relation to age, sex, gender, body build, and culture 21-40% of the time spontaneously.
0	The client produced appropriate vocal loudness in relation to age, sex, gender, body build, and culture 41-60% of the time spontaneously.
+1	The client produced appropriate vocal loudness in relation to age, sex, gender, body build, and culture 61-80% of the time spontaneously.
+2	The client produced appropriate vocal loudness in relation to age, sex, gender, body build, and culture 81-100% of the time spontaneously.

3.5. Resonance

Score	Standard Descriptions
-2	The client produced appropriate resonance in relation to age, sex, gender, body build, and culture 0-20% of the time spontaneously.
-1	The client produced appropriate resonance in relation to age, sex, gender, body build, and culture 21-40% of the time spontaneously.
0	The client produced appropriate resonance in relation to age, sex, gender, body build, and culture 41-60% of the time spontaneously.
+1	The client produced appropriate resonance in relation to age, sex, gender, body build, and culture 61-80% of the time spontaneously.
+2	The client produced appropriate resonance in relation to age, sex, gender, body build, and culture 81-100% of the time spontaneously.

4. RECEPTIVE AND EXPRESSIVE LANGUAGE

4.1.1. Phonology (Receptive)

Score	Standard Descriptions
-2	The client identified [target phoneme] in [isolation, syllable, initial/medial/final/all word positions, phrases, or sentences] with 0-20% accuracy spontaneously.
-1	The client identified [target phoneme] in [isolation, syllable, initial/medial/final/all word positions, phrases, or sentences] with 21-40% accuracy spontaneously.
0	The client identified [target phoneme] in [isolation, syllable, initial/medial/final/all word positions, phrases, or sentences] with 41-60% accuracy spontaneously.
+1	The client identified [target phoneme] in [isolation, syllable, initial/medial/final/all word positions, phrases, or sentences] with 61-80% accuracy spontaneously.
+2	The client identified [target phoneme] in [isolation, syllable, initial/medial/final/all word positions, phrases, or sentences] with 81-100% accuracy spontaneously.

4.1.2. Phonology (Expressive)

Score	Standard Descriptions
-2	The client produced [target phoneme] in [isolation, syllable, initial/medial/final/all word positions, phrases, or sentences] with 0-20% accuracy spontaneously.
-1	The client produced [target phoneme] in [isolation, syllable, initial/medial/final/all word positions, phrases, or sentences] with 21-40% accuracy spontaneously.
0	The client produced [target phoneme] in [isolation, syllable, initial/medial/final/all word positions, phrases, or sentences] with 41-60% accuracy spontaneously.
+1	The client produced [target phoneme] in [isolation, syllable, initial/medial/final/all word positions, phrases, or sentences] with 61-80% accuracy spontaneously.
+2	The client produced [target phoneme] in [isolation, syllable, initial/medial/final/all word positions, phrases, or sentences] with 81-100% accuracy spontaneously.

4.2.1. Morphology (Receptive)

Score	Standard Descriptions
-2	The client identified [target morpheme] in [words, phrases, sentences, or discourse] with 0-20% accuracy spontaneously.
-1	The client identified [target morpheme] in [words, phrases, sentences, or discourse] with 21-40% accuracy spontaneously.
0	The client identified [target morpheme] in [words, phrases, sentences, or discourse] with 41-60% accuracy spontaneously.
+1	The client identified [target morpheme] in [words, phrases, sentences, or discourse] with 61-80% accuracy spontaneously.
+2	The client identified [target morpheme] in [words, phrases, sentences, or discourse] with 81-100% accuracy spontaneously.

4.2.2. Morphology (Expressive)

Score	Standard Descriptions
-2	The client produced [target morpheme] in [words, phrases, sentences, or discourse] with 0-20% accuracy spontaneously.
-1	The client produced [target morpheme] in [words, phrases, sentences, or discourse] with 21-40% accuracy spontaneously.
0	The client produced [target morpheme] in [words, phrases, sentences, or discourse] with 41-60% accuracy spontaneously.
+1	The client produced [target morpheme] in [words, phrases, sentences, or discourse] with 61-80% accuracy spontaneously.
+2	The client produced [target morpheme] in [words, phrases, sentences, or discourse] with 81-100% accuracy spontaneously.

4.3.1. Syntax (Receptive)

Score	Standard Descriptions
-2	The client identified [target sentence structure (e.g., subject + intransitive verb)] during [routine tasks, structured tasks, or naturalistic exchanges] with 0-20% accuracy spontaneously.
-1	The client identified [target sentence structure (e.g., subject + intransitive verb)] during [routine tasks, structured tasks, or naturalistic exchanges] with 21-40% accuracy spontaneously.
0	The client identified [target sentence structure (e.g., subject + intransitive verb)] during [routine tasks, structured tasks, or naturalistic exchanges] with 41-60% accuracy spontaneously.
+1	The client identified [target sentence structure (e.g., subject + intransitive verb)] during [routine tasks, structured tasks, or naturalistic exchanges] with 61-80% accuracy spontaneously.
+2	The client identified [target sentence structure (e.g., subject + intransitive verb)] during [routine tasks, structured tasks, or naturalistic exchanges] with 81-100% accuracy spontaneously.

4.3.2. Syntax (Expressive)

Score	Standard Descriptions
-2	The client coded [target sentence structure (e.g., subject + intransitive verb)] during [routine tasks, structured tasks, or naturalistic exchanges] with 0-20% accuracy spontaneously.
-1	The client coded [target sentence structure (e.g., subject + intransitive verb)] during [routine tasks, structured tasks, or naturalistic exchanges] with 21-40% accuracy spontaneously.
0	The client coded [target sentence structure (e.g., subject + intransitive verb)] during [routine tasks, structured tasks, or naturalistic exchanges] with 41-60% accuracy spontaneously.
+1	The client coded [target sentence structure (e.g., subject + intransitive verb)] during [routine tasks, structured tasks, or naturalistic exchanges] with 61-80% accuracy spontaneously.
+2	The client coded [target sentence structure (e.g., subject + intransitive verb)] during [routine tasks, structured tasks, or naturalistic exchanges] with 81-100% accuracy spontaneously.

4.4.1. Semantics (Receptive)

Score	Standard Descriptions
-2	The client identified [target word, phrase] during [routine tasks, structured tasks, or naturalistic exchanges] with 0-20% accuracy spontaneously.
-1	The client identified [target word, phrase] during [routine tasks, structured tasks, or naturalistic exchanges] with 21-40% accuracy spontaneously.
0	The client identified [target word, phrase] during [routine tasks, structured tasks, or naturalistic exchanges] with 41-60% accuracy spontaneously.
+1	The client identified [target word, phrase] during [routine tasks, structured tasks, or naturalistic exchanges] with 61-80% accuracy spontaneously.
+2	The client identified [target word, phrase] during [routine tasks, structured tasks, or naturalistic exchanges] with 81-100% accuracy spontaneously.

4.4.2. Semantics (Expressive)

Score	Standard Descriptions
-2	The client coded [target word, phrase] during [routine tasks, structured tasks, or naturalistic exchanges] with 0-20% accuracy spontaneously.
-1	The client coded [target word, phrase] during [routine tasks, structured tasks, or naturalistic exchanges] with 21-40% accuracy spontaneously.
0	The client coded [target word, phrase] during [routine tasks, structured tasks, or naturalistic exchanges] with 41-60% accuracy spontaneously.
+1	The client coded [target word, phrase] during [routine tasks, structured tasks, or naturalistic exchanges] with 61-80% accuracy spontaneously.
+2	The client coded [target word, phrase] during [routine tasks, structured tasks, or naturalistic exchanges] with 81-100% accuracy spontaneously.

4.5. Pragmatics

Score	Standard Descriptions
-2	The client performed [target language use or pragmatic skill] during [routine tasks, structured tasks, or naturalistic exchanges] with 0-20% accuracy spontaneously.
-1	The client performed [target language use or pragmatic skill] during [routine tasks, structured tasks, or naturalistic exchanges] with 21-40% accuracy spontaneously.
0	The client performed [target language use or pragmatic skill] during [routine tasks, structured tasks, or naturalistic exchanges] with 41-60% accuracy spontaneously.
+1	The client performed [target language use or pragmatic skill] during [routine tasks, structured tasks, or naturalistic exchanges] with 61-80% accuracy spontaneously.
+2	The client performed [target language use or pragmatic skill] during [routine tasks, structured tasks, or naturalistic exchanges] with 81-100% accuracy spontaneously.

4.6. Prelinguistic Communication

Score	Standard Descriptions
-2	The client performed [target prelinguistic communication skill (e.g., joint attention, intentionality, communicative signaling)] during [target communicative context (e.g., play, feeding/mealtime)] 0-20% of the time spontaneously.
-1	The client performed [target prelinguistic communication skill (e.g., joint attention, intentionality, communicative signaling)] during [target communicative context (e.g., play, feeding/mealtime)] 21-40% of the time spontaneously.
0	The client performed [target prelinguistic communication skill (e.g., joint attention, intentionality, communicative signaling)] during [target communicative context (e.g., play, feeding/mealtime)] 41-60% of the time spontaneously.
+1	The client performed [target prelinguistic communication skill (e.g., joint attention, intentionality, communicative signaling)] during [target communicative context (e.g., play, feeding/mealtime)] 61-80% of the time spontaneously.
+2	The client performed [target prelinguistic communication skill (e.g., joint attention, intentionality, communicative signaling)] during [target communicative context (e.g., play, feeding/mealtime)] 81-100% of the time spontaneously.

4.7. Paralinguistic Communication

Score	Standard Descriptions
-2	The client performed [target paralinguistic communication skill (e.g., gestures, facial expression, body language)] during [target communicative context (e.g., play, feeding/mealtime, discourse)] 0-20% of the time spontaneously.
-1	The client performed [target paralinguistic communication skill (e.g., gestures, facial expression, body language)] during [target communicative context (e.g., play, feeding/mealtime, discourse)] 21-40% of the time spontaneously.
0	The client performed [target paralinguistic communication skill (e.g., gestures, facial expression, body language)] during [target communicative context (e.g., play, feeding/mealtime, discourse)] 41-60% of the time spontaneously.
+1	The client performed [target paralinguistic communication skill (e.g., gestures, facial expression, body language)] during [target communicative context (e.g., play, feeding/mealtime, discourse)] 61-80% of the time spontaneously.
+2	The client performed [target paralinguistic communication skill (e.g., gestures, facial expression, body language)] during [target communicative context (e.g., play, feeding/mealtime, discourse)] 81-100% of the time spontaneously.

4.8. Literacy

Score	Standard Descriptions
-2	The client performed [target reading, writing, spelling skill] with 0-20% accuracy spontaneously.
-1	The client performed [target reading, writing, spelling skill] with 21-40% accuracy spontaneously.
0	The client performed [target reading, writing, spelling skill] with 41-60% accuracy spontaneously.
+1	The client performed [target reading, writing, spelling skill] with 61-80% accuracy spontaneously.
+2	The client performed [target reading, writing, spelling skill] with 81-100% accuracy spontaneously.

5. HEARING

Score	Standard Descriptions
-2	The client [detected, discriminated, identified, or comprehended] [target environmental sound, phoneme, word, phrase, or sentence] with 0-20% accuracy spontaneously.
-1	The client [detected, discriminated, identified, or comprehended] [target environmental sound, phoneme, word, phrase, or sentence] with 21-40% accuracy spontaneously.
0	The client [detected, discriminated, identified, or comprehended] [target environmental sound, phoneme, word, phrase, or sentence] with 41-60% accuracy spontaneously.
+1	The client [detected, discriminated, identified, or comprehended] [target environmental sound, phoneme, word, phrase, or sentence] with 61-80% accuracy spontaneously.
+2	The client [detected, discriminated, identified, or comprehended] [target environmental sound, phoneme, word, phrase, or sentence] with 81-100% accuracy spontaneously.

6. SWALLOWING

Score	Standard Descriptions
-2	The client swallowed [target amount] of [target consistency] without clinical signs of aspiration 0-20% of the time spontaneously.
-1	The client swallowed [target amount] of [target consistency] without clinical signs of aspiration 21-40% of the time spontaneously.
0	The client swallowed [target amount] of [target consistency] without clinical signs of aspiration 41-60% of the time spontaneously.
+1	The client swallowed [target amount] of [target consistency] without clinical signs of aspiration 61-80% of the time spontaneously.
+2	The client swallowed [target amount] of [target consistency] without clinical signs of aspiration 81-100% of the time spontaneously.

7. COGNITIVE ASPECTS OF COMMUNICATION

Score	Standard Descriptions
-2	The client performed [target attention, memory, sequencing, problem-solving, executive functioning skill/task] during [target communicative context (e.g., play, feeding/mealtime, discourse)] with 0-20% accuracy spontaneously.
-1	The client performed [target attention, memory, sequencing, problem-solving, executive functioning skill/task] during [target communicative context (e.g., play, feeding/mealtime, discourse)] with 21-40% accuracy spontaneously.
0	The client performed [target attention, memory, sequencing, problem-solving, executive functioning skill/task] during [target communicative context (e.g., play, feeding/mealtime, discourse)] with 41-60% accuracy spontaneously.
+1	The client performed [target attention, memory, sequencing, problem-solving, executive functioning skill/task] during [target communicative context (e.g., play, feeding/mealtime, discourse)] with 61-80% accuracy spontaneously.
+2	The client performed [target attention, memory, sequencing, problem-solving, executive functioning skill/task] during [target communicative context (e.g., play, feeding/mealtime, discourse)] with 81-100% accuracy spontaneously.

8. SOCIAL ASPECTS OF COMMUNICATION

Score	Standard Descriptions
-2	The client performed [target social communication skill] during [target communicative context (e.g., play, feeding/mealtime, discourse)] with 0-20% accuracy spontaneously.
-1	The client performed [target social communication skill] during [target communicative context (e.g., play, feeding/mealtime, discourse)] with 21-40% accuracy spontaneously.
0	The client performed [target social communication skill] during [target communicative context (e.g., play, feeding/mealtime, discourse)] with 41-60% accuracy spontaneously.
+1	The client performed [target social communication skill] during [target communicative context (e.g., play, feeding/mealtime, discourse)] with 61-80% accuracy spontaneously.
+2	The client performed [target social communication skill] during [target communicative context (e.g., play, feeding/mealtime, discourse)] with 81-100% accuracy spontaneously.

9. COMMUNICATION MODALITIES

Score	Standard Descriptions
-2	The client used [target communication modality] to code [target content and form] for the purpose of [target language use] during [target communicative context (e.g., play, feeding/mealtime, discourse)] with 0-20% accuracy spontaneously.
-1	The client used [target communication modality] to code [target content and form] for the purpose of [target language use] during [target communicative context (e.g., play, feeding/mealtime, discourse)] with 21-40% accuracy spontaneously.
0	The client used [target communication modality] to code [target content and form] for the purpose of [target language use] during [target communicative context (e.g., play, feeding/mealtime, discourse)] with 41-60% accuracy spontaneously.
+1	The client used [target communication modality] to code [target content and form] for the purpose of [target language use] during [target communicative context (e.g., play, feeding/mealtime, discourse)] with 61-80% accuracy spontaneously.
+2	The client used [target communication modality] to code [target content and form] for the purpose of [target language use] during [target communicative context (e.g., play, feeding/mealtime, discourse)] with 81-100% accuracy spontaneously.