

Giving Voice to the Unspoken: The Critical Need for a Culturally-Tailored AAC App in Bhutan

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Abstract

The use of Augmentative and Alternative Communication (AAC) technologies helps meet communication requirements of those with Autism Spectrum Disorder (ASD) along with minimally verbal individuals. The availability together with the accessibility of AAC applications in Bhutan's context is poorly investigated at present. This study will evaluate the need for an AAC app in Bhutan through survey interviews with professionals, caregivers and educators who interact with ASD patients and minimally verbal individuals. The research shows an urgent need for improved communication support because a huge percentage of people want an AAC solution that matches their cultural and linguistic features. Participants revealed the problems arising from lacking communication support tools through their descriptions of problematic education and interaction as well as communication during daily activities. The research results highlight Bhutan's requirement for a specifically designed AAC application which will support ASD patients to improve their communication skills while simultaneously enhancing their independence and quality of life. The study can serve as a solid foundation for developing AAC applications that are well-suited to the preferences and needs of the Bhutanese population.

Key Words: *Augmentative and Alternative Communication, Speech Impairment, Symbol System, Communication Support, Accessibility.*

1. INTRODUCTION

According to World health organization (WHO, 2019), Autism Spectrum Disorder (ASD) is a brain-development condition that interferes with one's ability to socialize, and result to repetitive behaviors. It's a spectrum disease where the symptoms and effects differ greatly from one person to another. Even though the exact causes of autism are unknown, studies indicate that genetic as well as environmental factors affect the brain's development. Autism is mostly discovered early in life and continues into adulthood. Although there is no cure, early support and intervention enable autistic people to learn crucial everyday living skills, enhance their quality of life.

ASD is becoming better known around the world, and studies currently indicate that 1 in 100 individuals is being diagnosed (CDC, 2024). In Bhutan, too, cases of autism are on the increase according to experts at the National Disability Conference (The Bhutanese, 2024). Since accurate numbers are yet to be established, a study conducted from hospitals and schools indicates that there is an increase in cases.

This increasing detection places Bhutan in

challenging situations. Experts place high importance on the need to diagnose early, provide interventions that are targeted and community-based programs. Nevertheless, Bhutan lacks the supply of trained persons and autism specific services. Filling these gaps is very important for rendering proper care and building inclusion.

Bhutan reverberates with global attempts to understand ASD, but its particular social setting calls for locally applicable information. While world research, such as that published by CDC (2024), is helpful, it fails to capture the realities of autism in the country. Families are finding it to be hard to get enough help, and educators do not have a clear set of instructions for working with such students. The lack of good specific local data reduces the possibility of developing successful policies and services.

This research is an attempt to fill this gap by understanding the experiences of people with autism and their families in Bhutan. Its aim is to make the understanding better and provide better support for their development and inclusion.

The research is about the way of ASD individuals to communicate paying attention to communication as an important need of a human.

It examines the communication skills and tendencies of autistic people in social circumstances with the emphasis on the voices of ASD patients, their families, and caregivers.

The study identifies effective ways to enable the autistic individuals to actualise their goals in communication and enhance connections amongst people around. It explores the present barriers and strives to present the solutions for enhanced support systems, tools, and practices inclusive to persons with impairments.

Eventually, this research seeks to change the lives of both the autistic persons and their families in Bhutan. Many parents today are helpless to understand their children which result into frustration. Thus, by identifying the problems that exist, this study aims to be the basis for the ensuing meaningful solutions.

2. LITERATURE REVIEW

The ASD modulates perception and interaction with the environment, and hence, patients experience a range of personal experiences (Kassim & Mohamed, 2019). As the awareness of ASD increases, the challenges increase as well because its impact goes very deep to the individuals and their family. It has been found out through research that ASD is not a unique set of conditions but it is, rather, unique to every individual as they endeavors in daily life.

Communication is the main issue in the lives of autistic people. Even the individuals with typical language skills are still faced with the complex process of subtle language processing and pragmatic communication (Sturrock et al., 2023). These subconscious communication challenges may have a tremendous effect on peer relationships, academic performance and emotional well-being and typically lead to social isolation. Parents also complain that their children are having difficulty with complex conversations and instructions, a problem that does not facilitate the process of social and personal growth.

Socio-cultural factors play a big role in terms of understanding and management of ASD among communities. Studies from South Punjab indicate the role of cultural beliefs, poor access to healthcare, and stigma in delaying the diagnosis and adequate support (Aftab, Haider, & Amjad, 2024). The misconceptions and poor ASD awareness amongst care providers and families also slow down interventions.

Worldwide, there is an increase in the number of ASD patients being diagnosed with

the conditions due to better diagnosis and higher awareness of the people (Kassim & Mohamed, 2019). Since the rates are different across regions, this trend should encourage the implementation of more robust support systems, and all-encompassing services for autistic people and their families.

Plausible ASD interventions have to be holistic, that is, eliminate communication difficulties as well as cultural hindrances. Diagnosis and targeted support should go together to promote inclusion and well-being. Researchers and practitioners need to develop sensitive and respectful practices, as well as normalize access to services for these realities of the spectrum (Aftab, Haider, & Amjad, 2024; Sturrock et al., 2023).

AAC interventions play a crucial role in supporting the development of young children with Complex Communication Needs (CCN). Drager, Light, and McNaughton (2010) emphasize that children with CCN are at risk of delays in communication, language, cognition, literacy, and social participation, and that early AAC intervention can mitigate these risks by fostering functional communication skills, reducing challenging behaviors, and supporting both expressive and receptive language development. Their review highlights that AAC does not hinder speech production; rather, most studies report gains in natural speech following AAC use. Furthermore, functional communication training and visual schedules have been shown to reduce maladaptive behaviors while promoting independence, and aided language modeling enhances vocabulary acquisition and syntactic growth in children with developmental disabilities such as autism, Down syndrome, and cerebral palsy (Drager et al., 2010).

These findings align with broader research, which underscores the importance of early and systematic AAC implementation. For instance, Branson and Demchak (2009) reported that 97% of infants and toddlers receiving AAC interventions demonstrated improved communication outcomes, underscoring the effectiveness of early intervention. Similarly, Millar, Light, and Schlosser (2006) conducted a meta-analysis showing that AAC interventions often lead to increased speech production rather than suppression. External evidence further reinforces that AAC not only supports language development but also facilitates social inclusion and literacy skills, which are critical for long-

term educational and vocational success (Ronski & Sevcik, 2005; Light & McNaughton, 2014). Collectively, these studies suggest that AAC interventions—when introduced early and tailored to individual needs—serve as powerful tools for enhancing communication, reducing isolation, and improving quality of life for children with CCN.

3. METHODOLOGY

Research Design

Using a descriptive survey methodology the research examined communication obstacles and needs of autistic people and those with limited verbal skills from Bhutan. The research collected information from families together with caregivers and specialists in order to understand their communication experiences and determine how AAC tools could improve communication capabilities.

3.1 Participants

The study included 80 respondents, primarily parents, caregivers and specialists of autistic individuals across Bhutan. Community networks and autism support groups together with local organizations supporting disability rights were utilized to enroll the research participants.

3.2 Inclusion criteria

Individuals were approved for survey participation if they belonged to caregiver roles (parents or guardians or other care providers), specialist roles (such as speech therapists or occupational therapists or psychiatrists) or educator roles (including Special Education Need (SEN) teachers and teaching assistants). Participants required real-life experience in caregiving roles together with therapy or education work for autistic or minimally verbal individuals. For survey participation participants were required to show their willingness to share experiences and insights about their roles in working with autistic and minimally verbal individuals.

3.3 Exclusion criteria

The survey barred participation from individuals without first-hand experience in autism therapy work and autism education or caregiving duties. The exclusion criterion allowed the survey to gather responses only from individuals who had firsthand experience supporting autistic people which guaranteed precise data collection.

3.4 Sample size calculation

This study established the sample size through Cochran's sampling technique as it is used for situations where population numbers remain unspecified. The exact population count of ASD patients in Bhutan still remains unknown with many unreported and not yet diagnosed, which makes this method the most appropriate one for the survey.

This survey utilized a confidence level of 95% which indicated that results would hold their reliability at 95% while staying within the error margin. The results demonstrated accuracy within 5 percentage points because the study used $\pm 5\%$ as its margin of error. For maximum sample size calculation the estimated population proportion remained at 50%.

For the survey, a social media group (Whatsapp) consisting of parents and caregivers of ASD individuals from the country along with the specialists and therapists were the participants. All these participants represents the population of the entire country who have been added in the group after the confirmation of the child's diagnosis through various medical units in the Country. Using a population estimation of 100 individuals in that group resulted in a calculated sample size of 80 participants. These participants included mostly parents and caregivers from urban areas, and a very minimal numbers representing the ones from the rural areas. There is a disparity in participants' number representing from the urban and rural settings, thus the survey findings may not equally represent the challenges and perspectives of individuals from both settings, although it may clearly show the views and characteristics of the 80 participants involved in the study.

3.5 Data Collection Instrument

An organized questionnaire was developed to extract both numeric and verbal division information from respondents. It included a questionnaire consisting of multiple sections to explore specific domains of interest.

The questionnaire's first section obtained information about participant demographics including caregiver roles and autistic individual age brackets as well as the duration of caregiver-autistic individual contact. The collected data established essential background information on the demographic aspects of participant groups.

The second section studied communication methods as well as challenges by asking

participants to discuss autistic people's main communication approaches and their communication effectiveness in expressing needs. The survey examined autistic participants' use of AAC tools as it evaluated their selected devices or apps alongside their encountered barriers while utilizing these tools.

Participants in the third section discussed the main communication obstacles autistic people encounter when expressing themselves. The survey collected information about the areas and locations where communication proved most challenging to those with autism. This part yielded important knowledge about existing communication systems which proved insufficient.

The fourth section measured participant opinions regarding supplementary assistive devices that could strengthen autism-related communication capabilities. The participants assessed communication tools and services which they believed would maximize effectiveness in communication. This portion of the survey determined the communication obstacles people experience using present-day methods and revealed the specific areas where better support as well as resources need to be developed.

The final segment of the questionnaire gathered information about AAC apps which participants had used along with their intent to employ the CommuniApp for children with autism to enhance communication. The section evaluated fundamental components that matters in an AAC application with a focus on visual schedules and emotion tracking as well as educational content and behavior reinforcement functions. The survey participants were asked to contribute local cultural and contextual elements which the app developers should use to enhance its relevance for their community.

Participation was stimulated through the usage of community networks together with disability organizations accompanied by word-of-mouth referral methods. The research survey stayed accessible for several weeks to obtain increased responses while collecting different understandings from participants.

4. DATA ANALYSIS

The survey data underwent quantitative and qualitative analysis for this study's research. Various response types for multiple choice questions within the gathered quantitative data went through descriptive statistical analysis. The

analysis revealed statistical data patterns which showed user preference trends concerning AAC applications and common preferences in the field.

Thematic analysis served to interpret the qualitative data which were obtained through open-ended questions. Every response was evaluated to discover fundamental concepts which supported research objectives before categorizing responses based on common elements that revealed important research findings.

A comparative research approach evaluated how distinct demographic groups reacted to the study with specific focus on individuals experienced with AAC applications versus others. The comparative analysis demonstrated diverse views regarding app capabilities and user-friendly aspects and capability enhancement in supporting autistic individuals which improved the knowledge about participant requirements and their preferences for the AAC applications.

5. RESULT

The research discovers essential data about Bhutanese autistic persons' communication difficulties as well as family resource utilization patterns and necessary attention areas. The data are organized into key themes based on the research objectives.

5.1 Demographic Characteristics

The demographic analysis from the 80 respondents are shown in **Fig.1**. The distribution of working experience with autism or minimally verbal individuals as shown in **Table 1** revealed that only 8.8% had less than 1 year experience, while 36.2% individuals had 1-3 years, 22.5% with 4-6 years and 32.5% had more than 6 years of experience. This indicates that the survey participants consisted of an informed group of individuals.

Table 1: Working experience table

Years of experience	Individual (%)
Less than 1 year	8.8%
1-3 years	36.2%
4-6 years	22.5%
More than 6 years	32.5%

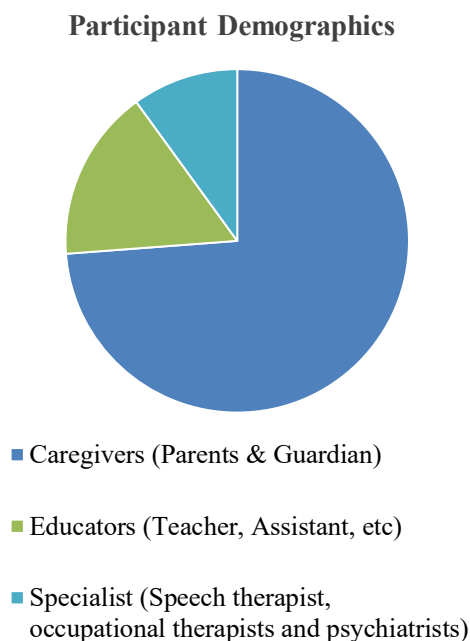


Fig. 1: Participant demographics from the 80 participants

Table 2: Autistic individual age range table

Age range (Years)	Individual (%)
Below 2	1.7%
3-5	47.5%
6-8	35.6%
9-11	8.5%
12-14	6.8%

From **Table 2**, it can be seen that most of the autistic or minimally verbal individuals who participated in our study ranges from three to eight years of age. Thus, the low percentage of individuals below two years implies the limited

early detection of ASD in Bhutan.

5.2 Communication Method and Techniques

Individuals who face communication difficulty use various methods to communicate and one or two-word speech remains the most prevalent (63.7%) alongside gestures (50%), facial expressions (25%), and vocalizations (37.5%). Additionally they utilize picture-based systems in 15% cases and symbols (7.5%) alongside sign language in 5% cases.

AAC tools receive limited distribution among users despite various available communication approaches. A minority of 11.3% reported using apps or devices for AAC but most people (88.8%) did not use any such tools. 33.3% of respondents preferred using smartphones and tablets as their main platforms.

Public perception reveals that the effectiveness of current communication approaches receives mixed results: 15% found them very effective, 46.3% rated it as somewhat effective, and 30% as moderately effective with 8.8% saying it as not effective. These shows that there should be better communication support from both AAC tools and caregiver support to help improve their communication skills.

5.3 Challenges Faced by Families

Children with autism and minimally verbal abilities face tremendous communication challenges for their families that result in social and growth complications. Survey results collected from the respondents showing the challenges they face are shown in **Fig. 2**.

The communication challenges affect different environments most seriously according to data which shows public spaces (78.8%) as the

Communication challenges faced by the individuals

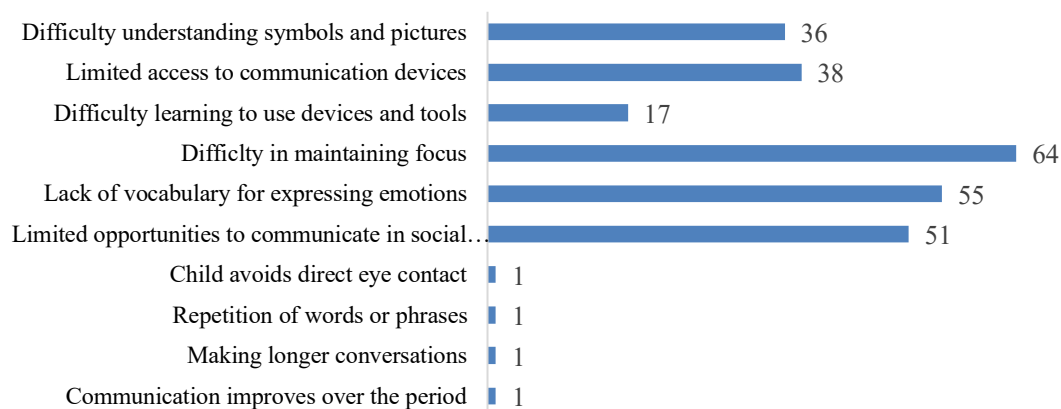


Fig. 2: Communication challenges faced by the individuals

top barrier followed by schools (56.3%). Social gatherings (53.8%) along with visits to healthcare providers (45%) cause communication challenges that make family life stressful on a daily basis.

5.4 Concerns Associated with Existing Platforms of Communication

The lack of communication between caregivers and autistic people develops from reduced speech and body language interactions. The high cost of AAC applications along with their complex installation requirements makes them difficult to operate and tools such as Picture Exchange Communication System (PECS) are deemed inconvenient due to scarce resources.

The communication challenges become worse due to emotional stress as parents express their dissatisfaction about the way their autistic child ignores eye contact and struggles to communicate their feelings. A shortage of qualified psychiatrists along with therapists restricts professional help availability for parents with autistic children. Some parents reject the use of AAC devices thus their children receive uncertain communication instruction. The current situation demands better supportive networks and accessible resources because of the pressing circumstances.

5.5 Interest in using an AAC application

The findings show that most of the participants (76.3%) indicated their willingness to employ an AAC application to help autistic persons communicate more effectively. Of the 80 participants only 5% showed no interest and 18.8% expressed their confusion.

When asked to rate the most important features to be included in an AAC app, the percentage of respondents who rated each features as the most important is shown in **Table 3**.

Table 3: Key features in an AAC app according to the participants

Important features in an AAC app	Respondent (%)
Expansive symbol collection	48.8%
Bilingual support for Dzongkha and English	58.8%
Text-to-speech feature	60%

Personalized symbol capability	53.8%
Parental controls	63.7%
Behavior analytics	58.8%
Offline accessibility	66.3%
Data protection	60%

5.6 Additional features essential for the AAC application

The research participants recommended adding Bhutanese cultural symbols along with phrases and concepts including family names as well as classroom objects, daily schedules, traffic signs and national symbols and traditional games. Several people stressed that the program required visual content which reflects Bhutanese culture because it would enhance understanding and application of learned material.

Participants request also centered around educational resources followed by emotion tracking which received 70% of requests and social stories and visual schedules with 65% and 57.5% requests respectively.

6. DISCUSSION

The study findings reveal that people with ASD and minimally verbal communication strongly require dedicated digital communication systems. Both the children and their caregivers face substantial communication difficulties which aligns with Sturrock et al. (2023) where they highlighted communication as the main issue in the lives of autistic people. The respondents insisted that autism spectrum disorder individuals must have a tool which enables effective communication between autistic individuals and external populations. The study participants specifically stressed how difficult limited communication channels impact non-verbal children.

Several participants including both parents and educators demonstrated strong approval for technological solutions which narrow communication gaps since current tools including communication boards provide insufficient adaptation abilities. Several users requested a single application which could adapt to personalize the needs of specific children. This request appeared frequently throughout all the responses.

The respondents strongly emphasized their dissatisfaction with the absence of local cultural

tools which aligns with the findings of Aftab, Haider, and Amjad (2024) where they highlighted the role of cultural beliefs in delaying the diagnosis and providing support to the ASD individuals. The respondents thus requested useful resources which should reflect Bhutanese cultural heritage by incorporating local symbols together with terms and academic materials made for the area so that it helps in aiding ASD individuals while being culturally relevant to the country.

The survey demonstrated that parents and educators together with caregivers already use mixed methods of mobile apps alongside traditional communication practices to reach children with autism spectrum disorders. These activities are precursors to other studies indicating that early and organised exposure to AAC facilitates communication, social integration, and literacy (Ronski & Sevcik, 2005; Light & McNaughton, 2014). The participants of this research, however, expressed the reason behind having a single, comprehensive platform which would save them the trouble of encountering fragmentation and inefficiencies in the existing methods.

Lastly, the respondents acknowledged that digital applications are a major potential to be used as long as they are tracked, and complemented by educational functions, developmental materials, and usable communication tools. The view has been endorsed by international evidence that AAC intervention leads to the enhancement of life quality and long-term results (Drager et al., 2010; Light & McNaughton, 2014). Simultaneously, the results of the findings contribute to the literature by highlighting the cultural and contextual requirements of the Bhutanese families, stressing the need to tailor further research and intervention to local conditions.

7. CONCLUSION

The study offers essential knowledge about autistic patients together with their families who live in Bhutan revealing the urgent requirement for early detection as well as therapeutic service accessibility and simplified AAC device availability for autistic individuals. This calls on policymakers to establish guidelines and solutions for the early diagnosis of autism along with the implementation of awareness programs on autism across schools and villages. Moreover, the majority of Bhutanese families demonstrated the need for culturally and linguistically adapted

AAC devices for their communities to promote local applications.

In addition to the proliferation of knowledge, this study also highlights the importance of a multi-sector collaboration to establish constructive service relationships. Inclusive success of individuals with ASD in Bhutan should be approached through a variety of concerted actions: more awareness campaigns, better educational support structures, and equal access to necessitating needs. Breakthrough in research, policy development and community-based actions will make all children be given the chance to communicate, learn and grow in dignity.

8. LIMITATIONS

The research results have meaningful value yet contains certain limitations. The collected data might not reflect the complete range of experiences shared by Bhutanese autistic individuals together with their families since the sample size did not adequately represent all ASD populations available in the country. Data obtained from caregivers presents a risk of reporting bias as their perceptions and experiences of such phenomena can show fluctuations.

A major limitation of the study emerged from difficulties in engaging populations that lacked technology and healthcare services along with other minority groups. Future studies should engage bigger and representative sample groups with autistic individuals and take their insights directly and examine long-term effects of AAC therapy so research can fully understand autism in the Bhutanese community and the need of such AAC applications.

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