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Early Literacy Assessment For Children With Autism Spectrum Disorders At Preschool

Putri Umrotur Rizqi[1], Umi Syaiful Ummah[2], Wiwik Dwi Hastuti[3], Zelynda Zeinab Malizal[4]
Universitas Negeri Malang, Indonesia[1,2,3]
Universitas Islam Internasional Malaysia, Malaysia[4]
Correspondent: putriumroturrizqi@gmail.com [1]

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ABSTRACT: Autism Spectrum Disorder is a disorder that causes children to experience obstacles in communication skills, starting from the child's language understanding. Where early assessment will help children with ASD to develop and improve their abilities, so early reading assessment needs to be carried out. Code-related abilities (such as letter knowledge, print concepts, and early writing) and meaning-related skills (such as vocabulary, recounting stories, and understanding) are used to evaluate early reading. The purpose of this study was to determine the early reading abilities of preschool children aged 3-5 years with ASD and also appropriate interventions according to their needs. This study uses a quantitative method of observation, interviews and document reviews to determine beginner reading assessment skills in children with ASD. The test was conducted on three preschool children aged 3 to 5 years: Kenzy, Excy, and Mikhael. From the results of this study, the early reading skills of children with ASD in Kenzy and Excy are limited to identifying consonants and vowels. At the same time, Michael only needs further reinforcement on several letters, and intonation is still flat. From the assessment results, multidisciplinary programs, phonological awareness, and natural developmental behavioural interventions (NDBI) can be given.

Keywords: Autism Spectrum Disorder (ASD), Assessment, Early Literacy, Intervention

INTRODUCTION

With an increasing number of students being diagnosed with autism spectrum disorders in regular classes, educators need to learn about the unique difficulties these students face and put plans in place to provide the necessary accommodations. Teachers everywhere must be prepared to serve students with autism spectrum disorders through inclusive pedagogical techniques to provide them with fair learning opportunities (Hutzler et al., 2019). Autism spectrum disorders (ASD), which are characterised by a variety of disorders of social communication skills, are characterised by the

presence of complex and highly heterogeneous neurodevelopmental disorders that are characterised by disturbances in interests and repetitive, restricted, and/or sensory behaviours. These obstacles will result in limited activities in various contexts and last longer (Miniarikova et al., 2023). Children with ASD frequently encounter obstacles in their schooling, which exacerbates their social and academic deficits (Paynter et al., 2016). As shown by several studies, children with ASD have four distinct reading profiles, particularly when it comes to their reading abilities: (a) average word reading and reading comprehension; (b) difficulty with reading comprehension; (c) difficulty with reading comprehension and word reading but good receptive vocabulary; and (d) generally low scores in oral language, reading comprehension, and word reading (Solari et al., 2019).

Assessment of the child will be needed to adjust the child's abilities and needs. Regardless of age or IQ, individual tests that generate a profile of the relative strengths and weaknesses of people with ASD can guide educational initiatives and serve as a foundation for tracking progress over time. The manuscript's "introduction" is essential for outlining the study's goals. It adds to the body of literature by analysing the methodological, theoretical, and empirical problems. The following sections will be connected to this introduction: the literature review. Early literacy abilities are developed in preschool, laying the groundwork for accurate, fluent, and comprehension-based reading. The term "early literacy" is generally used to describe when children develop the skills and abilities that precede the ability to read and write independently. The barriers that children with ASD experience can hinder their ability to read. Strong epidemiological evidence about the percentage of kids with ASD who struggle with reading is lacking. Given that ASD is characterised by communication disorders that impact spoken language and pragmatics and that between 25 and 35 per cent of children with ASD have minimal verbal abilities (i.e., little or no verbal communication) at school entry, it is not surprising that a large estimated percentage of children with ASD struggle with reading (Keen et al., 2016). Reading skills have components including oral language skills, knowledge of print concepts (such as environmental print recognition, print forms, conventions, and functions), alphabet knowledge (letter names and letter sounds), name writing and other emerging writing skills, and phonological awareness are all components of reading skills (Whalon et al., 2009). Preliterate children—unable to read new words or sentences—can be categorised as being in the early literacy stage. Code-related skills (such as letter knowledge, print concepts, and early writing) and meaning-related skills (such as vocabulary, story recounting, and understanding) should be used to evaluate their early reading abilities. Early reading skills can be assessed using non-formal methods to establish baseline performance levels for kids who cannot finish standardised tests. Compared to a recent systematic review of research on developing literacy abilities, children with ASD may have a relative advantage in code-related skills (such as alphabet knowledge) (Westerveld et al., 2017).

Thus, early assessment allows us to begin interventions much earlier in life. To get the best results, it can be challenging to plan and modify interventions for very young infants. The circumstances surrounding children with ASD will be the main focus of this investigation. It is critical to acknowledge the literacy and social communication needs of kids with ASD. The primary purpose of this article is to provide an overview of the reading abilities of children with ASD and to confirm that code-related reading skills are a relative strength of children with ASD and can be achieved as early as preschool age at 3–5 years. The assessment's findings will offer suggestions for an

intervention to enhance their skills and assist children with ASD in assessing their academic performance in reading.

METHOD

This study uses a qualitative method that aims to obtain a description of the language skills of students with Autism Spectrum Disorder (ASD) aged 3-5 years at the preschool level. The qualitative method examines the various meanings in the research subjects' actions, behaviours, and actions (Harahap, 2020). The language skills to be studied include the skills of understanding vowel and consonant letter symbols, reading syllables, words, and sentences, and reading questions, statements, and commands.

Research Population

The determination of the subjects in this study used a purposive sampling technique, and this study had specific criteria in its selection. The subjects of this study were students with ASD aged 3-5 years who were studying at the preschool level. Participants met the following inclusion criteria: (1) children aged 3-5 years. (2) children with autism spectrum disorder (ASD) diagnoses, (3) children who can make sounds.

Determining Individual Goals

The participants' early reading ability is measured using an assessment focusing on the differences between vowels and consonants. This assessment will focus on understanding the language symbols of vowels and consonants and reading syllables. After that, the evaluation will focus on reading words with several patterns. Reading a sentence will be added if the child can provide good assessment results. This standard assessment tool will produce the early reading ability of children with ASD. From these results, educators can determine the child's needs and the correct implementation according to the child's abilities. This assessment will (a) reflect the child's ability to identify vowels and consonants, (b) show the child's ability to read syllables with the pattern CV, VC, CVC, CCV, VCC, (c) show the ability to read words with the pattern CV, VC, CVC, CCV, VCC. (d) show the ability to read statements, questions, and commands.

Data Collection

At the data collection stage, this study used interviews, observations, and document reviews (Harahap, 2020). The procedures applied in this study are as follows:

1. This observation involves observing the research object, such as the learning process, and making considerations.
2. Interviews will collect data on initial reading skills, focusing on understanding vowel and consonant letter symbols, reading syllables, words, and sentences, and reading questions, statements, and commands.
3. Reviewing documents that aim to obtain data through video recordings, photos, and research subject interviews.

Data to assess the effectiveness of the assessment is collected in the initial session of Identification and maintenance. Each participant will also be observed during class activities, such as learning to recognise letters and telling stories or fairy tales.

Research Instruments

Mechanical skills are needed in beginning reading, which are the first order. The components of beginning reading (Tarigan, 2008; Sunardi, 2009). As follows:

1. Recognising letter shapes.
2. Recognising uppercase and lowercase letters in the alphabet.
3. Pronouncing letter sounds consisting of single consonants, single vowels, double consonants, and diphthongs.
4. Combining consonant-vowel letters to form words and sentences.
5. Sound variations.

This beginning reading is a basic level of reading ability, which includes activities such as recognising a reading symbol, recognising words, and understanding how to pronounce the symbols and words. So from the components above, an initial reading assessment instrument can be drawn as follows:

Table 1. Instrument Grid

Component	Scope	Material Description
Early Literacy	1. Understanding vowel language symbols (letters)	a) Identification of printed vowel language symbols (letters).
	2. Understanding consonant language symbols (letters)	a) Identification of printed consonant language symbols (letters).
	3. Reading syllables	a) Reading patterned syllables CV b) Reading patterned syllables VC c) Reading patterned syllables CVC d) Reading patterned syllables CCV e) Reading patterned syllables VCC NB: C= consonant V= vowel
	4. Reading Words	a) Reading words that have patterns CV b) Reading words that have patterns VC c) Reading words that have patterns CCV d) Reading words that have patterns VCC

NB: C= consonant V= vowel

5. Reading Sentences	a. Reading declarative sentences b. Reading question sentences c. Reading command sentences

Table 2. Beginning Reading Assessment Instrument

Subject	Question Items	Ability		Explanation
		Already	Not yet	
1. Understanding vowel language symbols (letters) a. Identification of printed vowel language symbols (letters).	1. Students are asked to read small print vowels: **a, i, u, e, o** 2. Students are asked to read capitalised vowels: **A, I, U, E, O** 3. Students are asked to connect capitalised vowels with lowercase vowels.: **a • • I** **i • • O** **u • • E** **e • • A** **o • • U**			
2. Understanding the symbols of language	1. Students are asked to read small print consonants:			

(letters) consonants. b. Identify printed consonant language symbols (letters).	**b, c, d, f, g, h, j, k, l, m, n, p, q, r, s, t, v, w, x, y, z** 2. Students are asked to read capitalised consonant letters: **B, C, D, F, G, H, J, K, L, M, N, P, Q, R, S, T, V, W, X, Y, Z** 3. Students are asked to connect capitalised consonants with small printed vowels.: **b • • P** **d • • R** **p • • D** **q • • B** **r • • M** **f • • N** **m• • Q** **n • • F**
3. Reading syllables. a. Reading patterned syllables CV	1. The following syllables are to be read by the students: **ba, do, pi, qu, ke**
b. Reading patterned syllables VC	2. The following syllables are to be read by the students: **ar, on, im, up, eg**
c. Reading patterned syllables CVC	3. The following syllables are to be read by the students: **cak, gan, vas, man, bad**
d. Reading patterned syllables CCV	4. The following syllables are to be read by the students: **nya, ngi, khe, nyo, ngu**

e. Reading patterned syllables VCC	5. The following syllables are to be read by the students: **ang, ing, eng, ikh, akh**
4. Reading Words a. Reading words that have patterns in the CV	1. The following words are to be read by the students: **baca, budi, pagi, mana, lari**
b. Reading words that have patterns VC	2. The following words are to be read by the students: **malam, sulit, anak, adik, aman**
c. Reading words that have patterns CCV	3. The following words are to be read by the students: **nyanyi, ngopi, nyuci, semangat, khusus**
d. Reading words that have patterns VCC	4. The following words are to be read by the students: **bang, ping-pong, bangku, langka, ikhwan**
5. Reading Sentences a. Reading declarative sentences	1. The following sentences are to be read by the students: **budi membaca buku** **ayah sedang minum kopi** **putri bernyanyi di panggung** **adik lari-lari di pinggir pantai** **tadi pagi, budi pergi ke pasar**
b. Reading question sentences	2. The following sentences are to be read by the students: **dimana budi membaca buku?** **apa yang sedang ayah lakukan?** **dimana putri bernyanyi ?** **kapan budi pergi ?**

		kemana budi pergi ?
c.	Reading command sentences	3. The following sentences are to be read by the students: **bacalah tulisan ini!** **pergi dari sini!** **tolong bukakan pintu!** **cepat pulang ke bandung!** **bernyanyilah !**

Data analysis

The data analysis conducted is by describing the results of completing the instrument questions that have been obtained from interviews and observations regarding children's early reading skills. After that, data analysis will be conducted to see if the assessment can be used for children with ASD. The interview data analysis will be adjusted to their early reading ability indicators. This study will analyse and describe the data from the assessments that have been collected. After that, this study uses sample data to make predictions and conclusions that go beyond the data. The test given to measure the early reading ability of children with ASD will be in the form of material identifying information and questions in the assessment instrument that has been created.

RESULT AND DISCUSSION

The term autism spectrum disorder (ASD) describes a severe developmental disease that impacts social interaction and verbal and nonverbal communication abilities. This disease affects children with ASD's academic performance and typically manifests before the child turns three. (Lanter et al., 2009). The ability of children with ASD in several areas, including spoken language, comprehension of print concepts, alphabet knowledge, recognition of novel names and written forms, and phonological awareness, are internal variables (Shanahan et al., 2008). The assessment was carried out to determine the child's abilities and skills in early reading. In the assessment instrument of this study, the components tested were understanding consonant and vowel letter symbols with lowercase and capital letters; understanding of reading syllables, which have several patterns, namely consonant-vowel, vowel-consonant, consonant-vowel-consonant, consonant-consonant-vowel, and vowel-consonant-consonant; comprehension of reading words, where children with ASD will read a word with a consonant-vowel, vowel-consonant, consonant-vowel-consonant, consonant-consonant-vowel, and vowel-consonant-consonant pattern; and finally reading a sentence, where the sentence given will be a question, statement, and command sentence. In implementing the assessment test conducted on three children with ASD aged 3-5 years in preschool, several results showed similarities and differences. In the results, Kenzy showed the

ability to distinguish several letters. Meanwhile, Excy could not identify, and Michael showed the most significant ability.

Individual variation in the degree of language deficit compared to nonverbal abilities is believed to have multiple causes. One possible explanation is the difficulty in processing auditory information. Since speech sounds are more complicated than tones and include brain systems linked to but distinct from those used to interpret non-speech stimuli, speech-sound stimuli are believed to be more helpful in identifying probable causes of language difficulties (Dehaene-Lambertz et al., 2005). The results of the assessment of three children with ASD in this study showed the following.

Understanding Consonant and Vowel Symbols

Kenzy

In the results of Kenzy's assessment in the consonant and vowel identification component, Kenzy can correctly identify and pronounce several lowercase consonants and vowel letters. In vowel letters, Kenzy still has difficulty recognising the letters "a" and "e." In addition, in consonant letters, Kenzy cannot distinguish several letters that have similar shapes, such as "p-q-b-d" and the last sequence of letters, namely from the letters "v-w-x-y-z." While in capital letters, Kenzy cannot identify.

Excy

The results of Excy's assessment in the consonant and vowel identification components show that the child has not been able to identify a letter. However, Excy can identify the lowercase letter "a." In addition, Kenzy cannot identify a single consonant letter but can imitate the letters mentioned, but the focus is not on the letter pointed or held.

Mikhael

The results of Mikhael's assessment in the consonant and vowel identification component show that Mikhael can identify all consonants and vowels in the form of lowercase and capital letters. However, Mikhael looks confused when the letters "O" and "Q" are in capital form; Mikhael feels he has mentioned it, but after, Mikhael realises he can say it correctly.

Understanding Syllables and Words

Kenzy

The assessment results show that Kenzy cannot identify syllables independently. Kenzy follows the assessor's voice. When asked to mention it independently, Kenzy looks confused and only says the syllables he remembers. In word identification, Kenzy also imitates what has been mentioned, but in this word, when Kenzy is asked to do it independently, he falls silent.

Excy

In the assessment results on the syllable and word identification component, Excy showed results that were not much different from Kenzy's. However, Excy could not mention syllables and words independently, even following some syllables and words the assessor spoke. As a result, the child became more unfocused and silent.

Mikhael

In the initial reading assessment results on identifying syllables and words, Mikhael got more significant results than the others. Mikhael can do it perfectly; Mikhael can identify and pronounce it. Although in his pronunciation, there are still some syllables and words that are not too stressed on some letters, the child can identify them well.

Sentence Comprehension

Kenzy and Excy

In the assessment results, Kenzy and Excy's abilities and skills did not reach the stage of sentence comprehension. When the assessment was carried out on the sentence identification component, they could not identify or follow the assessor's voice. Their abilities and skills only reached the element of identifying consonant and vowel understanding.

Mikhael

The most significant results were shown in Michael's initial reading assessment. Michael could read declarative, question, and command sentences. However, in reading sentences, Michael still read with the same intonation and flat; there was no emphasis or difference in the intonation spoken.

The assessment results of three children with ASD showed that there were obstacles in the children's language abilities and skills. Given that communication impairments impacting oral language and pragmatics are a hallmark of ASD, it is not surprising that a significant percentage of children with ASD have reading difficulties. Furthermore, by the time they enter school, between 25 and 35 per cent of kids with ASD have very little or no verbal communication abilities. According to other studies, most participants thought that consistent with earlier research findings, children with ASD who possess strong phonological awareness, oral language abilities, and alphabet identification typically pick up reading more quickly (Dynia et al., 2014; Mohan & Tiwari, 2023). Although it has been estimated that roughly 60% of children with ASD experience some language impairment, Estimates of the percentage of children with ASD who are better at nonverbal communication than verbal communication vary (Tager-Flusberg & Joseph, 2003). It discovered that in 34% (14 of 47) of children with ASD aged 6–13, nonverbal skills outperformed verbal skills as assessed by the Differential Ability Scales. Furthermore, 48% (35 of 73) of preschool-aged children with ASD showed a similar pattern (Joseph et al., 2002).

Other studies show good oral comprehension in children with ASD is based on positive perceptual reasoning abilities. According to Assouline et al. (2012), there is a favourable correlation between the Perceptual Reasoning Index score and the oral language proficiency of children with ASD, particularly those with an IQ of 70 or higher(Assouline et al., 2012). Oral language scores, however, did not correlate with other indices like verbal comprehension, working memory, or processing speed.

Phonology deals with the sound structure of a particular language, illustrating how linguistic objects are distinguished by sound differences and how context-dependent sounds might change an element's sound structure. Cognitive operations based on language's phonological or sound structure are called phonological processing. Rapid naming (the capacity to rapidly link verbal and visual information), phonological memory (the capacity to temporarily store information in working memory), and phonological awareness (the metacognitive ability to be aware of one's thought processes) are some of the components of this processing. Nonetheless, several studies have demonstrated that phonological processing issues persist in people with ASD who also possess strong intellectual capacities. Particular suprasegmental traits, such as stress, pitch, or vocal patterns applied to consonants and vowels during speech, are often present in the unique speech patterns of children with ASD. For instance, they might talk too loudly or softly, with a tone that lacks emotion or a voice that is too hoarse, while other aspects of speech are often neglected (Vogindroukas et al., 2022).

Emergency Literacy Intervention for Children with ASD

Phonological awareness, the capacity to recognise, manipulate, synthesise, and segment speech sounds, is crucial in predicting reading proficiency. (Hus & Segal, 2021). This ability requires linguistic knowledge encompassing phoneme and grapheme manipulation at many levels, including alliteration, rhyme, and phonemic awareness (Hus & Segal, 2021; Williams et al., 2008). This skill is closely related to reading ability and is very important in developing reading skills. Children with ASD can benefit from various programs to enhance their reading skills and abilities.

The importance of reading instruction lies in skills that emphasise code and meaning. The analysed research indicates that teaching the five reading domains and practices recommended by the NRP may help children with ASD despite the small number of studies and the wide variations in quality. With an emphasis on language and reading comprehension in the early grades, the data backs comprehensive reading instruction that covers all five reading domains. Phonics instruction that follows the NRP in the general school curriculum may benefit kids with ASD. The NRP suggests, for instance, that kids be taught how to recognise the sounds in words (phonemic awareness), map those sounds to the letters (phonics), and then combine those sounds to produce words (Network, 2002).

Additionally, the NRP discovered that the best reading comprehension technique was asking questions. Visual cue cards combined with text can teach children with ASD to come up with inquiries. Until the youngster can develop inquiries independently, this first framework can be progressively reduced to visual cues combined with cue words and visual cues alone. Self-monitoring checklists can also help kids with ASD remember to pause while reading and ask

questions. Similar to teaching comprehension methods to children, teachers must describe the strategy's goal and demonstrate how to utilise it while thinking aloud and using the appropriate cues (such as visual cue cards, text, cue words, and/or self-monitoring checklists) (Whalon et al., 2009b).

The two primary focuses of evidence-based interventions for code- and meaning-related literacy skills are (a) providing children with opportunities for meaningful, natural, self-initiated, and contextual interactions with written and spoken language daily and (b) providing highly targeted, systematic, professionally-directed training in regularly scheduled sessions. The last subtheme, enriched literacy environments, encourages children with ASD to be exposed to print and literacy resources that aid their literacy development (Piasta et al., 2020).

Children with ASD can benefit from multidisciplinary programs covering various developmental abilities and enhancing early literacy. There is currently a dearth of resources and instructional materials for kids with ASD, which is critical given our societal setting. Parental awareness and support programs are crucial to give children outside assistance and information about coping mechanisms to help them manage stress, particularly in environments with limited resources. In a nation with a high population density like India, where there are few trained human resources, parents are an essential source of intervention and support for children with ASD (Sengupta et al., 2017).

Young children between the ages of one and three are typically the target of nonverbal language interventions during the nonverbal phase. As they age, many kids stop speaking or undergo linguistic regression. Developing fundamental communication awareness, enhancing communication attitudes, and promoting pronunciation are the primary objectives for kids at this time. Using impromptu scenarios and various behavioural techniques, natural developmental behavioural interventions (NDBI), a set of interventions carried out in natural settings, assist autistic children in acquiring necessary and suitable survival skills. NDBI is used organically daily (Schreibman et al., 2015). Communication impairments and social behaviour issues are the primary deficiencies in children with ASD. For children under three, their family's everyday activities serve as their primary social environment, and their parents and family are the main social objects with whom they engage. As a result, caregivers have numerous chances to apply NDBI techniques to enhance children's and their offspring's daily development (Crank et al., 2021; Volkmar et al., 2014) it can lessen the effect of interruptions to training throughout the outbreak. Children with lower expressive abilities at the beginning (equivalent to less than 11.3 months of age) showed more significant progress than children with higher expressive skills, according to a randomised controlled trial on communication-focused interventions in children with a diagnosis of ASD and minimal verbal abilities (less than 30 functional words or the inability to communicate only by speaking).

A few kids in the intervention group demonstrated improved expressive skills (Brignell et al., 2018). These findings demonstrate the significance and efficacy of early language communication interventions. Intentional dyspraxia and other speech difficulties are common in children with ASD and are not brought on by injury to the articulation organs. Children's imitation training is the primary focus of interventions for speech impairments. Implementing various educational methods, this training can begin with mimicking broad movements and progress to mimicking

oral and delicate movements. It can concentrate on moving from "characters" to "words" and then "short sentences.". Work steadily up to phrases and sentences by beginning with pronounceable syllables. This pronunciation imitation technique should progress from silent imitation to sound pronunciation. Exaggerated reactions can provide instant evaluation and rewards in this process, and intuitive games can draw children's attention to help them get through the silent interval faster. This strategy will advance their linguistic growth (Cui et al., 2023).

CONCLUSION

Problems with communication skills are common in children with autism spectrum disorder (ASD) and often begin with language comprehension. The three children showed different results in their abilities, although they could all identify some letters. Interventions that can be used are multidisciplinary programs, phonological awareness, and natural developmental behavioral interventions (NDBI). In creating programs, modifications are still needed to adapt to the needs of children with ASD. The earlier the assessment is carried out, the more it will help the child to improve his abilities and determine appropriate interventions for children with ASD. This study had limited information about the level of ASD in children, so it is not known whether there is a correlation in intellectual disabilities regarding the significant differences in outcomes in children with ASD in these findings.

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