



The Use of Storybook for Eating Problems in Child with Asperger Syndrome

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Abstract. Introduction: Children with autism are characterized by having higher levels of sensory sensitivity and cognitive and behavioral inflexibility. Thus traits might represent problems in eating, such as selective eating and food avoidance. These problems might present until adulthood if not given early intervention and might result in imbalance nutrition. This study aims to assess the effectiveness of occupational therapy programs combined with story books reading sessions in modifying patient eating habits. **Method and Result:** A six year old boy with Asperger syndrome experienced difficulty in eating caused by sensory problems. The patient often refuses eating when the texture, taste, or smell is different than his preference, this problem makes the patient hesitate trying new food. Application of storybook reading session expected to improve eating problems during pandemic Covid-19. This book was designed using attractive colors, images and games to improve patient attention during each therapy session. The book consists of an introduction of eating utensils, steps and rules during eating, and various menus which can be adjusted based on subject preference. The story book session was delivered 3 times a day combined with a home program assisted by a caregiver. Subject functional independence measurement (FIM) before the program was 1 which means the patient needed a full support (100%) for the eating. After the intervention, the patient's FIM score increased to 2 which means can do 25% of activities without support during eating. **Conclusion:** Story book sessions were effective to improve eating problems by increasing patient attention and improving patient independence in eating activity. Further research and adjustment of the storybook for asperger syndrome was needed.

Keywords: Storybook, eating, asperger syndrome, ASD, occupational therapy

1 INTRODUCTION

Asperger syndrome is a term used for disorders of neurodevelopment in the autism spectrum which are characterized by impairment of communication and social skills. Children with autism are characterized by having higher levels of sensory sensitivity and cognitive and behavioral inflexibility. Asperger syndrome diagnosis was included in general autism spectrum disorder (ASD) and already removed from Diagnostic and Statistical Manual of Mental Disorders (DSM-5). [1] ASD is a group of neurodevelopmental disorders that occur in early childhood with traits problems or impairment in communication and social interaction, having restricted interest, and repetitive behaviors. Asperger syndrome was diagnosed by symptoms and clinical specifiers, the contrast between Asperger syndrome and autism disorder was in Asperger syndrome there is no diagnostic criteria in the communication domain, no onset before age three, no significant language delay, and no deficit cognitive development. [1] World Health Organization (WHO) predicts that there will be 1 in 160 children or as many as 7.6 million children in the world suffer from spectrum disorders autism. Number of people with autism in United States in 2012 about 500,000-1 million children with age range 6-17 years. [2]

Major problems of Asperger syndrome might include integration of sensory, sensory motor, difficulties in social communication or interacting with his peers. [1] Further impact of Asperger child not only affects activity daily living but also have lower social interaction with his peer and reducing the quality of life. [3]

In conjunction with a reducing quality of life, child with Asperger also having difficulty in sensory input resulted in eating problem like picky eating (only eating particular foods and concern with weight, shape, or body image of the food), food avoidance and fear of trying new foods. [3] Eating problems and persistence disturbance in eating have a significant health impact such as imbalance of nutrition which might continue and progress to other diseases. Further impact in Asperger syndrome with eating problems resulted in difficulty in using utensils, rejecting food which is in accordance with his preference. [4] Early diagnosis of Asperger syndrome with eating problems might improve patient and parent relationship thus improve quality of life. [5]

A complex approach is needed to alleviate the problems in daily activities of Asperger syndrome patients. Serial programs of social integration and sensory integration might help the problems in Asperger syndrome patients. One of the approaches taken in occupational therapy for Asperger syndrome is a combination of audiovisual modality like the use of storybook telling. Other studies show that storytelling could increase social interaction and improve creativity of Asperger patients thus improving language ability in daily living. Originally, storytelling was a common method used to convey a message in children because it might help children in visualized a situation with the who, what, when, where, and why the situation happened. [6,7]

This study focused on eating activities which performs every day, three times a day and having a direct impact in patient health. This study aims to evaluate the eating ability of Asperger syndrome patients after getting a serial program of storytelling using story books with eating themes as a supportive therapy in occupational therapy programs.

2 LITERATURE REVIEW

Study by Alain N. Sahin explains that storytelling is a common way to deliver messages in communication. The problems of neurodevelopmental in children with Asperger syndrome or autism made it difficult in understanding a direct language or expression delivered by body language. [6] Thus characterized by social problems and repetitive behavior in daily living. Children with Asperger syndrome were having difficulties in communicating and responding to other people's feelings because of underdeveloped the "theory of mind" as it normally develops in people without Asperger. The study further shows evidence that storytelling sessions can assist Asperger patients to integrate into society. [6]

Additional treatment by giving storytelling had been evaluated by some researchers. Building of "digital storytelling for children with autism: software development and pilot application" explained storytelling might improve children's creativity and imagination is one of the research. ASD children with neurodevelopmental problems have social communication and imagination impaired, therefore they prefer more personal activity and less social interaction. Children with autism also have different ways to process information which makes them biased in grasping the purpose of the communication and difficult in doing activities step by step. This research explained during learning sessions, children with autism are more interested in images rather than text or oral information and also have high interest in using computers for learning and leisure. [8]

Digital storytelling was targeted for children with autism which focused on improving their social skills through the use of images. The images used are designed and structured according to ASD children's needs. Digital storytelling provides information about what to do, how long it takes, when it finished, and what the desired outcome of the activity to support their independence in doing activity. Digital content was adapted based on ASD severity with four level difficulty with the easiest part consisting of the least images. During session, the user was given a task with several picture to arrange in the right order to create a story and every correct answer, the user will get a present. to check the user improvement, a result log is presented after task completion. [8]

3 METHOD

A 6-year old boy diagnosed with Asperger syndrome lived with his parents, sisters and caregivers. The parent claims that his son had several problems in sensory and sensory motor which resulted in delayed walking, running and communication. Patients also

cannot focus on online class, easily distracted by noise and movement. Further interview with his parents revealed that the most concerning problem was eating. The patient had a picky eater which only preferred some food with shape or size as his preference. The patient is also afraid to try new food. The caregiver told the patient still unable to differentiate and use eating utensils correctly. The parents hope for patients to be more independent in daily activity especially in eating activities.

The occupational approach begins with functional activity assessments to measure the extent of the problems affecting patients in doing daily activities. FIM (Functional Independence Measurement) was used to evaluate the functional ability and the patient obtained one score in eating, bathing and toileting activities. [9]

The patient underwent a serial program designed to improve sensory integration and revise eating problems. One of the serial programs was using a storybook with an eating theme. The book was made customized for patients by using thick paper for the cover and uneasily ripped paper because the patient frequently tried to rip the paper. The book was designed using attractive colors, images and games to improve patient attention during each therapy session. The book consists of an introduction of eating utensils, steps and rules during eating, and various menus which can be adjusted based on subject preference. The story book session was delivered 1-3 times a day combined with a home program assisted by a caregiver.

The therapy session with storytelling using eating theme story books focused on improving patient eating ability which became a major concern for the parent. The parents believe their children should be able to eat independently and eat a variety of foods when they attend school later.

Table 1. FIM (Functional Independence Measurement) Assessment

FIM ASSESSMENT			
<i>Refer to the FIM Performance Level for available scores</i>		ADMISSION	DISCHARGE
Assessment Date		23/04/2021	23/06/2021
Motor sub-scale	Eating	1	2
	Grooming	3	3
	Bathing	1	1
	Dressing Upper Body	5	5
	Dressing Lower Body	7	7
	Toileting	1	1
	Bladder Management	1	1
	Bowel Management	1	1
	Transfer bed/chair/wheelchair	7	7
	Transfer toilet	7	7
	Transfer bath/shower	7	7
	Locomotion	7	7
	Stairs	7	7
	Motor Subtotal Score (<i>max. score 91</i>)		55
Cognition sub-scale	Comprehension	2	2
	Expression	7	7
	Social interaction	2	2
	Problem solving	3	3
	Memory	2	2
	Cognition Subtotal Score (<i>max. score 35</i>)		16
TOTAL FIM SCORE (<i>max. score 126</i>)		71	72
<p>FIM Performance Levels</p> <p>1 – Total contact assistance with helper</p> <p>2 – Maximal contact assistance with helper</p> <p>3 – Moderate contact assistance with helper</p> <p>4 – Minimal contact assistance with helper</p> <p>5 – Supervision or setup with helper</p> <p>6 – Modified independence with helper</p> <p>7 – Complete independence</p>			

The storybook session was held in a room without distraction. To start the storybook, the therapist must build a friendly relationship with the patient to create a happy atmosphere but stay conducive. When both the patient and the therapist are ready, the storytelling starts with the therapist explaining the book by “Kalau Kau Suka Hati” song tone. The session was given using song tone because the patient knew having interest in song and music. This storybook consists of 10 pages, during the session each page will be briefly and clearly explained to the patient.

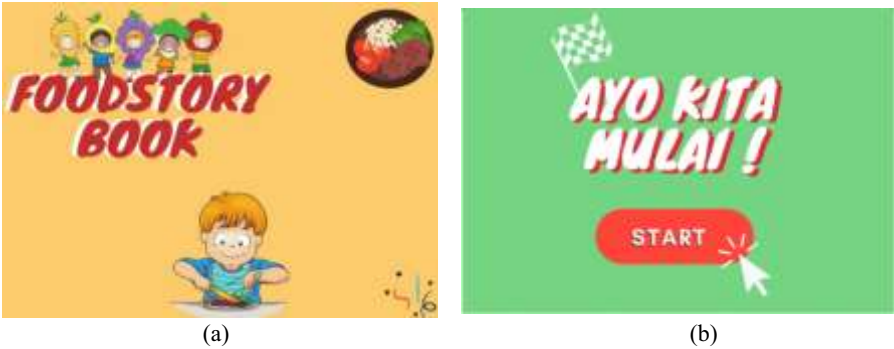


Fig. 1. Front cover (a) and page 1 of the storybook (b). The patient was introduced to the storybook and for the starter the therapist or caregiver made a simple question like “can we start now? Are you ready?” or “what do you want to eat today?” to build communication.



Fig. 2. Pages 2 (a) and page 3 (b) of the storybook. The page 2-3 will explain what is hungry and what to do if we are hungry. The therapist or caregiver can ask the patient “what would you like to eat when you are hungry?”.



Fig. 3. Page 4 of the storybook. The page 4 will explain what to do if we want to start eating, what utensils we need and where we could get those utensils, in this session we directly practice with the patient how to prepare eating utensils independently.



Fig. 4. Page 5 of storybook. The page 5 will explain how to fill the plate when the patient is hungry, where he can find the food and how to reach that food. In this session we brought the patient to the eating table with various menu has been prepared on the table.



(a)



(b)

Fig. 5. Pages 6-7 of the storybook. The page 6-7 explains what can we do and don't during eating session.



Fig. 6. Pages 8-9 of the storybook. The pages 8-9 explain why we should eat and what if we didn't eating.



Fig. 7. Page 10 of the storybook. The last page is a brief review of the storybook.

The storybook session was delivered 1-3 times a day combined with an occupation program. Each session is estimated to take 30-60 minutes depending on patient cooperation. The caregiver was educated on how to give the storytelling to the patient, so this storytelling session was delivered by the therapist and continued by the caregiver. The storytelling session was held 2 months after the patient went through an occupation therapy session which focused on sensory integration.

4 RESULT AND DISCUSSION

After two months of therapy sessions combined with storytelling sessions, the patient FIM (Functional Independence Measurement) showed an improvement in eating activities. Before a therapy session, the patient needs total assistance in eating activities

(score 1), after therapy the patient can do 25% of activities without support during eating or needs maximal assistance (75%) from helper (score 2).

Storytelling consists of images, text, sound and animation. Previous study showed that storytelling might be a way to help individuals with ASD in learning. Individuals with ASD have different ways of learning, they can focus better in a structured environment with clear instructions, need more repetition of learning tasks and generally prefer images rather than text. The study concluded that visual instruction or images make individuals with ASD easier to understand tasks. The disruption of connectivity in frontal and parietal regions in individuals with ASD might be related to lack of comprehension in communication or text. [8,10]

Storytelling using storybooks with eating themes is used as supportive therapy in this study. Storytelling session was using attractive and colorful images sequentially to make a clear instruction. Repetition of the session helps the patient understand the instructions step by step. The patient began to gain more independence in eating activities compared to before the therapy session. Patient was a 6 year-old boy diagnosed with Asperger syndrome. The patient had problems in eating which is picky eater and sensory problems especially in tactile, visual, gustatory and olfactory. Thus problems disrupt patient daily activity particularly in eating activities. The relation between being picky eater and autism was well discussed in previous literature. Children with autism tend to have a restricted diet, refuse trying new food and eat more limited food than his peers. These problems might be caused by problems in sensory activity (texture, temperature, taste and smell), behavioral inflexibility, and motor problems (chewing or using utensils). Continuous problems in eating activities might place the children at risk of under-consuming micronutrients such as vitamin A, D, E and other nutrients like calcium, folic acid, and fiber. Previous research showed evidence of autism spectrum having greater risk of overweight or obesity which might be due to eating carbohydrates rich foods diet. This eating problems might exist in autistic adolescents and adults and related to difficulties in motor control, social pressure during mealtimes, difficulty judging hunger or satiety. [11]

Early diagnosis and early intervention in autism patients is important. Early intervention in autism aims to improve social function, communication, improve cognitive abilities and reduce repetitive behaviors. The intervention in autism patients might be multiple and related multidisciplinary such as intervention in occupational programs, dietary intervention and drug or non-drug treatment. (10,12) Program of occupational therapy for Asperger syndrome might be different one to another depending on how this syndrome affects each individual and family. The aims of occupational therapy was to manage patient condition and minimize the impact. [5]

The occupational therapy focused on patient problems which majority in sensory field like tactile, visual, gustatory and olfactory areas. These problems might develop into problems in eating activity such as selective eating or food avoidance and over or under

consumption of the specific nutrients. [4] After occupational therapy program, the patient went through a storybook session 2 times a week for 2 weeks. Each session lasts 30-60 minutes depending on patient cooperation.

The storybook contained a social story with an eating theme that described eating situations and can be adapted to real life situations which occurred in the patient. The storytelling session can be convincing and easy to understand by children with autism because the book uses colorful pictures. The objective of social stories explained in previous study is to assist children with ASD in teaching socially appropriate behaviors and reduce disruptive or repetitive behaviors. The storybook about eating in this study is flexible and can be adjusted to the situation, for example if today's menu was chicken soup the utensils for storybook session was a bowl and a spoon. The therapist or caregiver who delivered the storytelling can explain the contents of the soup. The storytelling session is held 1-3 times a day depend on patient cooperation, so that caregiver should be teach how to deliver the storybook telling.

5 CONCLUSION

The therapy session using storytelling with eating theme storybooks as a supporting home therapy for Asperger syndrome patient with eating problems can improve patient ability to eat, as presented by increase in the FIM score from 1 to 2, which means from totally dependent to partially dependent (100% to 75%). Further therapy session is needed to improve eating ability independently.

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