

Designing a Social Story for Reducing Undesirable Eating Behaviors Among People with Autism: A Case Study

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Abstract

This study aimed to design a Social Story, based on Gray, that reduces undesirable eating behaviours among individuals with autism and compare their behaviours before and after the intervention. It was conducted in three subjects with autism, using the ABAB reversal single-subject design. Undesirable eating behaviours were observed and then they were used to develop Social Story in line with Gray's three steps. The tools underwent quality testing in both the content validity and the pilot implementation to check the language and understanding in an individual with autism who was similar to the subjects. The data was then analysed using descriptive statistics. The developed Social Story consisted of five pages, containing five images and five sentences. After using the developed Social Story, the reduction of undesirable eating behaviours occurred in Case 1, 2 and 3 in all four phases of the study. In Phase 1, in the baseline data was gathered, the average occurrences of the behaviours were 13.50%, 11.83% and 10.00%, respectively. Then, in Phase 2, the first treatment phase (B1), the average occurrences were 10.83%, 8.54% and 7.83% respectively. Then, in Phase 3, the intervention withdrawal, they were 9.42%, 5.92% and 8.33% respectively. In Phase 4, the second treatment phase, the percentages reduced to 7.42, 5.58 and 6.30, respectively. This study proves that the designed Social Story was effective in reducing undesirable eating behaviours in people with autism and should be adapted and applied to others with the same behaviours as appropriate. Further studies can be done on the effectiveness of Social Story in supporting people with autism in other aspects such as enhancing social skills and interaction, reducing other undesirable behaviours or even developing Social Story e-books.

Introduction

In 2016, the Department of Mental Health, Ministry of Public Health estimated that the prevalence of autism in the Thai general population was 0.006 percent or 1 in 16,666 (Department of mental health, 2016) Autism is associated with developmental

disabilities that are clearly manifested in three major features – mood disorders and repetitive behaviour, language and communication disorders and social interaction disorders (Lotrakul & Sukanich, 2015; Reynolds & Kamphaus, 2013). Such disorders hinder individuals with autism from understanding

the circumstance, controlling emotions or behaviours and adapting to the event, causing them to express undesirable behaviours found in daily life behaviours, such as, social skills, social interaction and daily routines. Empirically-proven treatments and supports include pharmacotherapy, behaviour therapy and social rehabilitation (Sirirutraykha, 2018). Rehabilitation, particularly in personal and social skills, has become an issue of interest, as it serves as the prevention and solution for the aforementioned problems for individuals with autism. They tend to have great difficulty with food consumption, as 48 to 49 percent were reported to have eating problems (McDonald, 2014). The problems include being selective or rejecting certain kinds of food, ingesting non-food items (pica) and vomiting when having to ingest certain kinds of food (Wheeler, 2018). These undesirable behaviours result in difficulty in daily functioning and self-care (Chantra, 2009). Thus, it is crucial to provide aids, make adjustments and enhance their healthy eating behaviours. Literature review shows empirical evidence supporting the effectiveness of a Social Story in reducing undesirable eating behaviours in individuals with autism (Tawankarnjanachot, 2016). Mohammed & Mostafa (2012) studied the use of a Social Story to adjust eating behaviours of individuals with autism, who had difficulty controlling the amount of food ingested, causing food spillage and choking. When choking, they tended to use their hand to take food out of the mouth. It was found that a Social Story was effective in enhancing their ability to control the portion and reduce the habit of taking food out of the mouth manually. After the intervention was withdrawn, the adjusted behaviours still persisted. From the evidence mentioned above, the treatment needs to be tailored to the individual's abilities and problems, therefore, assessment and observation are required beforehand. It is also important to have cooperation from parents, healthcare professionals and educational personnel. A Social Story should be specific to the individual's behaviours. The researchers have employed Gray' (2014) principles to develop a Social Story suitable for reducing undesirable eating behaviours so that the individuals can make adjustments and have normal daily living capacities.

Objectives

1. To design a Social Story that reduce undesirable eating behaviours in individuals with autism
2. To compare the behaviours of individuals with autism before and after the intervention

Hypothesis

Undesirable eating behaviours of the individuals will reduce after the designed Social Story is used.

Methods

This study was an ABAB reversal single subject design, consisting of four phases – Phase 1: baseline data gathering (A1), Phase 2: the first treatment (B1), Phase 3: intervention withdrawal (A2) and Phase 4: the second treatment (B2). The results or treatment outcomes were evaluated based on comparison of the data collected during the treatment and the baseline data obtained before the experiment began.

Demographic characteristics and case studies

Population

The population of this study was individuals with autism aged 3 to 8 years old who received treatment at the In-Patient Department, Rajanagarindra Institute of Child Development (RICD), Mae Rim District, Chiang Mai Province.

Sampling

There were three case studies selected by purposive sampling

Criteria

The case studies were individuals with autism who were selected based on the following criteria:

1. Having undesirable eating behaviours
2. Aged 3 to 8 years old and receiving treatment at the In-Patient Department, Rajanagarindra Institute of Child Development (RICD), Mae Rim District, Chiang Mai Province
3. Informed consent provided by the caregiver
4. The caregiver's ability to communicate in Thai

Research instruments

The research instruments employed in the study were as follows:

Tools for research implementation

1. One Social Story on the problematic behaviours of the case studies, which was developed based on Gray (2014)

2. Screening tests for undesirable eating behaviours

2.1 The Interview Form for Caregivers of Individuals with Autism, created (Iamsupasit, 2013), was used to obtain the information on undesirable eating behaviours of the individuals. The tool did not undergo quality testing because it was an interview form used for collecting data of the behaviours clearly expressed by the individuals.

2.2 The Guideline on Defining Target Behaviours by the Child Development Center, the Northern Region (2005) contained a guideline on defining target behaviours and behavioral questions that were clearly related to behaviours. The researchers did not test the quality of the tool because once it was compared to the manifested behaviours, the behavioral assessment were in line with the specifications.

2.3 The Target Behaviour Assessment Form by Iamsupasit (2013) was a table consisting of nine yes-no question items. Its quality was not tested because it was a behavioral assessment that was in line with the specifications. 2.4 Ranking Question for Target Behaviours by Iamsupasit (2013) was a table consisting of nine yes-no question items. Its quality was not tested because it was a behavioral assessment that was in line with the specifications. Data collections.

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Data collection tool

The data collection tool was the Undesirable Behaviours Observation Form Using Interval Recording (Iamsupasit, 2013).

Quality assessment

1. Content validity

1.1 The Social Story was created, based on Gray (2014) and then tested for content validity by five experts – two child and adolescent psychiatrists and three advanced practice nurses. The content validity index (CVI) obtained was 0.96, which is acceptable (Polit & Beck, 2006). Afterwards, they were piloted with an individual with autism who had undesirable eating behaviours in order to test for language and pictorial comprehension. The individual showed

comprehension in both the language and pictures so the stories were subsequently used with the case studies

2. Reliability

The behaviour observation form used for data recording was tested for reliability. The researchers collaborated with autism care specialists who had a minimum of three years of experience at the Rajanagarindra Institute of Child Development, in observing the behaviours of all three case studies simultaneously. Measured using the kappa statistic, the interrater reliability was acceptable at above 0.60 (Hartmann, 1977). Five consecutive attempts of eating with hands were simultaneously observed and tested for reliability, yielding a reliability of 0.69, 0.79 and 0.80, respectively.

Procedures and data collection method

Pre-experiment stage

1. The researchers presented the research proposal and tools to the Research Ethic Committee, Faculty of Nursing, Chiang Mai University.
2. The researchers submitted a permission request, issued by the Faculty of Nursing, to the Director of the Rajanagarindra Institute of Child Development
3. The research assistants received explanations on the definition of undesirable eating behaviours, the procedures, the data collection method and the time-interval recording of observed data.
4. The research project was publicised through PR boards and announcements, calling for four case studies, one for the pilot and the other three for actual data collection.
5. The researchers met with the case studies and their caregivers to introduce themselves, asked for permission to conduct the research, and explained the objectives, procedures, duration and protection of rights.

Process in designing the Social Story

1. Undesirable eating behaviours were assessed using the set of screening forms, consisting of the Interview Form for Caregivers of Individuals with Autism, the Guideline on Defining Target Behaviours of the Child Development Center, the Northern Region (2005) the Target Behaviour Assessment Form and the Ranking Question for Target Behaviours Iamsupasit (2013). All four case studies had undesirable eating behaviours, which was eating with their hands, and

therefore the researchers used that behaviour to design the Social Story in the subsequent step.

2. The undesirable eating behaviours were used to develop the Social Story, which was based on Gray (2014). The stories consisted of short sentences with illustrations. The stories were then tested for content validity and piloted on an individual with autism.

Experiment and data collection process

1. The experiment was divided into four phases, using the ABAB reversal design.

1.1 In Phase 1 (the baseline-A phase), the individuals' behaviours were observed without the intervention. The target behaviours were expected to occur in the dining room at lunchtime for the duration of one hour, once a day. The data was then used to determine the baseline in the line charts. The observation lasted for five days in total.

1.2 In Phase 2 (the first intervention-B phase), the researchers read the created Social Story to the individuals, for five minutes a day, in a peaceful room before mealtime. Then, the research assistants observed the target behaviours in the dining room during lunchtime for one hour. The data was recorded in the form of a line chart. This phase lasted for 10 days in total.

1.3 In Phase 3 (intervention withdrawn-A phase), the Social Story was not given to the individuals. The observation was done an hour a day in the dining

room at lunchtime. The data was recorded in the form of a line chart, and the duration of this phase was five days.

1.4 In Phase 4 (the second intervention-B phase), the process was the same as the first intervention. The researchers read the Social Story to the individuals for five minutes a day and the research assistants observed the target behaviours for the duration of 10 days in total.

2. The researchers checked for the accuracy and completeness of the collected data, which was subsequently analysed statistically.

Results

Case Study 1

1 In Phase 1, at the baseline (A1), the average of the behaviour, eating with hands, was 32.40 attempts, or 13.50% of the times. In the B1 phase, the average was 26 attempts, or 10.83%. In the A2 phase, after the intervention was withdrawn, the occurrence of behaviour was averaged at 22.60, or 9.42%. Then, in the B2 phase, the average was 17.80 attempts, or 7.42%. The data obtained from all four phases is presented in Figure 1 in the form of a line chart to compare the percentages and mean percentages of the occurrences of undesirable eating behaviour across all phases.

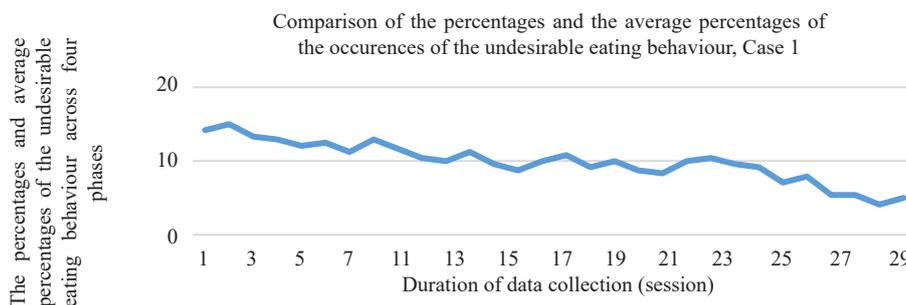


Figure 1: Comparison of the percentages and mean percentages of the occurrences of undesirable eating behaviour across the four

Case Study 2

In Phase 1, the baseline (A1) had an average behaviour occurrence of 28.40 attempts, or 11.83%. Then in Phase 2 (B1) and Phase 3 (A2), the averages

were 20.50 (8.54%) and 14.20 (5.92%), respectively. In the final phase, the number dropped to 13.40, or 5.58%. The data obtained from all four phases is presented in Figure 2 in the form of a line chart to

compare the percentages and mean percentages of the occurrences of undesirable eating behaviour across all phases

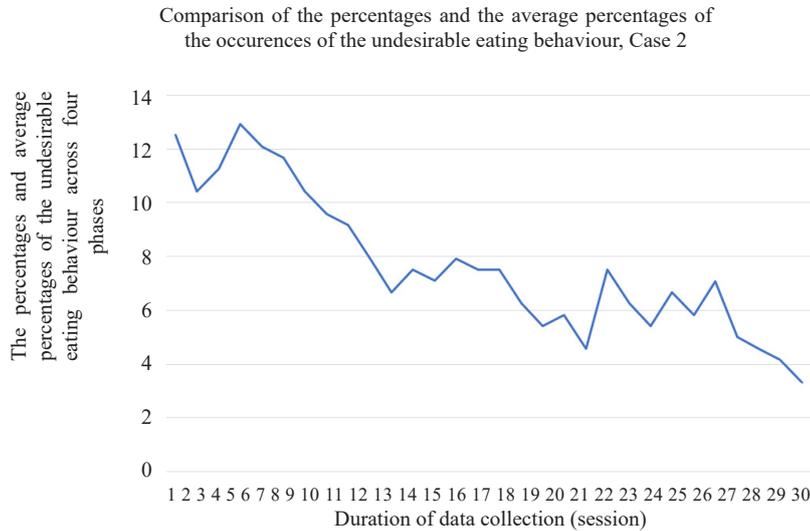


Figure 2: Comparison of the percentages and mean percentages of the occurrences of undesirable eating behaviour across the four phases, Case 2

Case Study 3

In Phase 1, the average behaviour occurrence was 24 attempts, or 10%. In Phase 2 (B1), the average number was 18.80 (7.83%). Then, in Phase 3 (A2) and 4 (B2), the averages decreased to 21.20 (8.33%) and 15.10 (6.30%), respectively. The data obtained

from all four phases is presented in Figure 3 in the form of a line chart to compare the percentages and mean percentages of the occurrences of undesirable eating behaviour across all phases

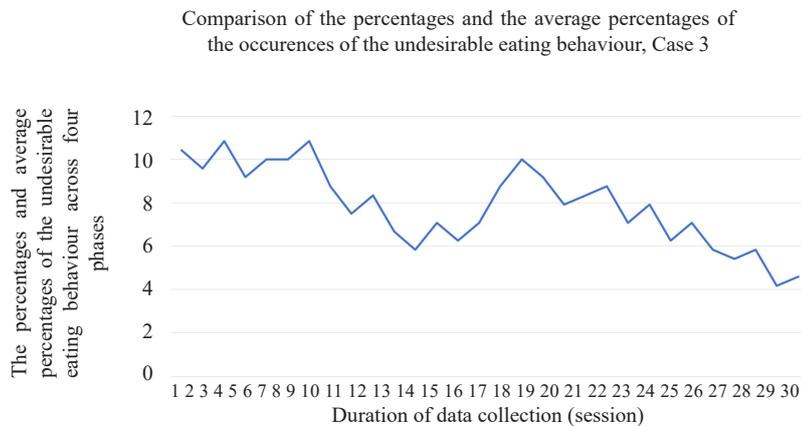


Figure 3 Comparison of the percentages and mean percentages of the occurrences of undesirable eating behaviour across the four phases, Case 3

When the data from all three cases were graphed, the decrease of undesirable eating behaviour was apparent, as shown in Figure 4 below.

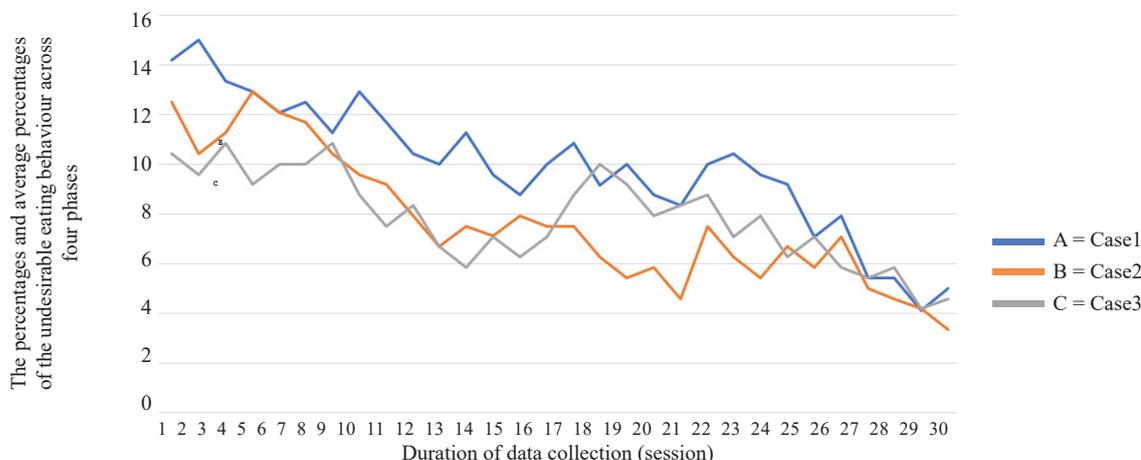


Figure 4 : Comparison of the percentages and mean percentages of the occurrences of undesirable eating behaviour across the four phases

Discussion

The results are discussed in relation to the objectives, as follows.

1. To design a Social Story that reduces undesirable eating behaviours in individuals with autism

The process of designing the Social Story includes the assessment and selection of undesirable eating behaviours and story creation using Gray's (2014) method. The five-page story consisted of four primary sentences and one secondary sentence, for making explanations, indicating dimensions or perspectives, expressing intentions, expressing collaboration and support, and expressing mutual feelings.

2. To compare the behaviours of the individuals with autism before and after the intervention

The three individuals with autism showed reduced undesirable eating behaviour after receiving the intervention, as seen in the differences in the occurrences of the behaviour

2.1 Case 1 – During Phase A1, the average of the behaviour was 32.40 attempts, and when compared with A2, the number decreased to 22.60. It was also found that during the intervention phases, there was a reduction in the behaviour – 26 attempts in

the first intervention (B1) and 17.80 in the second intervention (B2).

2.2 Case 2 – When comparing Phases A1 and A2, the average drops from 28.40 before the intervention, to 14.20 after withdrawing the intervention. A similar pattern manifests in the B phases, as the average of the behaviours in B1 was 20.50, reducing to 13.40 in B2.

2.3 Case 3 – The behaviour averaged 24 in Phase A1 and declined to 18.80 in B2. As for the intervention phases, there was a decline in average from B1 to B2 as well, from 21.20 to 15.10.

The results of this study are consistent with the theory of classical conditioning, which holds that the learning of many organisms results from conditioning. That is, a response to, or learning by a stimulus, is conditioned with the stimulus or the current event, which does not usually occur in normal circumstances. The designed Social Story is tailor-made to reduce undesirable eating behaviour of individuals with autism and its effectiveness in reducing the behaviour is probably due to the concurrence between the individual's behaviours, and the Story's content and illustrations which were especially made for individuals with autism,

helping them to understand the message better. Regarding data collection, the researchers selected a dining room as the location, which studied the reduction of undesirable behaviours and social skill enhancement for individuals with autism, aged 5 to 15, at school, and saw a reduction in undesirable behaviours and an improvement in social skills. Moreover, the findings are consistent with Doss (2013) which used the Social Story as the intervention to reduce undesirable behaviours of an individual with autism at home. The behaviours occurring during homework included shouting, crumpling paper and hitting the mother. After applying the intervention, the individual showed a reduction in such behaviours, reducing the mother's stress and giving the parents satisfaction.

Suggestions for application

The findings prove the Social Story's effectiveness in the reduction of undesirable eating behaviour, and therefore, the researchers have the following suggestions for further application:

1. In terms of care, the designed Social Story can be used with other individuals with autism who have the same undesirable eating behaviour, or applied to those who have different undesirable eating behaviours with some adaptations to maximise suitability. Also, training in creating Social Stories should be provided to other professionals so they can design Social Stories for individuals with autism who have other problems, when at home or during development stimulation sessions.
2. In terms of administration, the findings should be presented to executives responsible for the care of individuals with autism to show the significance of the issue, and consequently, Social Story intervention training can be provided for professionals in the field of autism care to reduce undesirable behaviours or enhance their social skills.

Reference

- Chantra Rungnapa. (2009). Quality of life of caregivers with autism. *Journal of Nursing, Ministry of Public Health, 20*(1), 72-84.
- Child Development Center the Northern Region. (2005). *Integrated Child Care Handbook with Autism, Volume 4, Behavior Adjustment Co-learning and caring for children with autism*. Chiang Mai: Somporn Printing.
- Department of mental health. (2016). *Prevalence of Autistic in population*. Retrieved 24 March 2018 From http://statv2.nic.go.th/Health/05020203_06.php.
- Doss, A. (2013). *Social Story Intervention for Children with Autism to Decrease Challenging Behavior during Homework* (master's thesis). The Honors College. USA.
- Gray, C. (2014). *Social Story*. Retrieved 6 June 2018 from <https://carolgraysocialstories.com/social-stories/>.
- Hartmann, D. P. (1977). Considerations in the choice of interobserver reliability estimates. *Journal of applied behavior analysis, 10*(1), 103-116.
- Iamsupasit, S. (2013). *Theories and techniques in behavior modification*. Bangkok: Chulalongkorn University.
- Lotrakul Manote & Sukanich Pramote. (2015). *Ramathibodi Psychiatry (4th edition)*. Bangkok: Department of Psychiatry. Faculty of Medicine Ramathibodi Hospital, Mahidol University.
- Mcdonald, N. (2014). *Food Selectivity And Weight Status In Children With An Autism Spectrum Disorder (Doctoral dissertation)*. Colorado State University. USA.
- Mohammed, A., & Mostafa, A. (2012). The Effect of Social Story intervention Technique on Self-Management of Eating Behavior of a Child with Autism. *International Journal of Psycho-Educational Sciences, 1*(1), 32-43.
- Polit, D.F., & Beck, C.T. (2006). The content validity index: Are you sure you know what's being reported?. Critique and recommendations [Electronic version]. *Research in Nursing & Health, 29*(5), 489-497.
- Reynolds, C. R., & Kamphaus, R. W. (2013). *Autism Spectrum Disorder*. Retrieved from <https://images.pearsonclinical.com/images/assets/>

base3/basc-3resources/DSM5_Diagnostic
Criteria_AutismSpectrumDisorder.pdf.

- Sirirutraykha, T. (2018). *An integrated approach to autism care*. Retrieved 16 August 2018 From <http://www.specialchild.psu.ac.th/artical/41-autism/69-2011-02-07-06-45-16.html>.
- Tawankarnjanachot Nadlada. (2016). Social skills for school-age children. *Journal of Psychiatric Nursing and Mental Health*, 30(2), 1-21.
- Wheeler, M. (2018). *Mealtime and children on the Autism Spectrum: Beyond Picky, Fussy, and Fads*. Retrieved 6 July 2018 from <https://www.iidc.indiana.edu/pages/mealtime-and-children-on-the-autism-spectrum-beyond-picky-fussy-and-fads>.