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# IMPLEMENTATION OF THE SMART ABA METHOD ON TOILET TRAINING SKILLS IN CHILDREN WITH AUTISM SPECTRUM DISORDER

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**Abstract: Implementation of The Smart ABA Method on Toilet Training Skills in Children with Autism Spectrum Disorders.**

This experimental study aimed to determine the effectiveness of the Smart ABA (Smart Applied Behavior Analysis) Method on toilet training skills in children with ASD (autism spectrum disorder), using Single Subject Research Design on two subjects (5 and 7-year-old boys) treated at the KID-ABA Autism Center, Indonesia. Data analysis using graphic visual analysis. None of the subjects had any abilities at the initial assessment. Baseline data were obtained by recording daytime wetting times during the first three days of therapy. Parents guided by competent Smart ABA therapists carried out this toilet training. The most important finding of this study was the success of both subjects in daytime toilet training within 43 and 65 days, confirming the effectiveness of the Smart ABA Method in toilet training for children with ASD. The results of this study are expected to provide an in-depth understanding of toilet training management for parents of children with ASD, therapists, professionals, and doctors, as well as to provide a significant scientific contribution to independent toilet skills in children with ASD.

*Keywords: Autism, Toilet Training, Smart ABA Applied Behavior Analysis, Smart ABA, Single Subject Research.*

**Abstrak: Penerapan Metode Smart ABA terhadap Keterampilan Buang Air Kecil pada Anak dengan Gangguan Spektrum Autisme.**

Studi eksperimental ini bertujuan untuk mengetahui efektivitas Metode Smart ABA (Smart Applied Behavior Analysis) pada pelatihan keterampilan buang air kecil pada anak dengan ASD (*autism spectrum disorder*), menggunakan Desain Penelitian Subjek Tunggal pada dua subjek (anak laki-laki berusia 5 dan 7 tahun) yang diterapi di KID-ABA Autism

Center, Indonesia. Analisis data menggunakan analisis visual grafik. Semua subjek tidak memiliki kemampuan apapun pada asesmen awal. Data dasar diperoleh dari pencatatan waktu mengompol siang hari pada tiga hari pertama dimulainya terapi. Demikian selanjutnya penambahan waktu 5 menit dilakukan dengan cara yang sama. Latihan buang air kecil ini dilaksanakan oleh orangtua/pengasuh yang dipandu oleh terapis Smart ABA berkompeten. Temuan terpenting dari penelitian ini adalah keberhasilan kedua subjek dalam pelatihan buang air kecil dalam waktu 43 dan 65 hari, yang mengkonfirmasi efektivitas Metode Smart ABA dalam pelatihan buang air kecil untuk anak-anak dengan ASD. Hasil penelitian ini diharapkan dapat memberikan pemahaman yang mendalam bagi orang tua anak dengan ASD, terapis, profesional, dan dokter dalam manajemen pelatihan buang air kecil; Serta memberikan kontribusi ilmiah yang penting untuk keterampilan buang air kecil pada anak-anak dengan ASD.

*Kata Kunci: Autisme, Pelatihan Buang Air Kecil, Smart ABA, Smart Applied Behavior Analysis, Penelitian Subjek Tunggal.*

## INTRODUCTION

Toilet training is an essential skill that is very important for every child because it is the first step towards independence in using the toilet. This process is usually taught early and is carried out gradually to ensure the child understands and can master the skill well. This has been widely reported by Khair and Hasanah (2021) and Geist and Bammer-Zimmer (2023). This skill is one of the most difficult for children in general (Taubman & Blum, 2008), especially for children with autism spectrum disorder (ASD). Appropriate techniques are needed in training ASD children to master independent toilet skills from an early age.

Toilet training for children with ASD must use the proper techniques, one of which is the Smart ABA (Smart Applied Behavior Analysis) Method. The smart ABA Method is a development of the ABA (Applied Behavior Analysis) Method for Autism (Anwar et al., 2022). The effectiveness of Smart ABA has been studied by Sutadi et al. (2022). Lovaas was the first professional to apply behavior modification principles to autism, which became known as the ABA Method (Lovaas et al., 1967). The effectiveness of ABA has been studied by Du et al. (2024). Development in Smart ABA, including toilet training for children with ASD. This study is very crucial so that

ASD children can master independent toilet skills gradually as soon as possible.

In previous studies, the implementation of toilet training for both ASD and non-ASD children, children are scheduled to go to the toilet within the specified time (Azrin & Foxx, 1971; Bacotti et al., 2023; Dalrymple & Ruble, 1992; Perez et al., 2020). However, when scheduled to go to the toilet, the child did not urinate, so it was rescheduled. This can cause children to have daytime wetting. The researcher has not found any study on practical techniques for situations where the child does not urinate when scheduled to go to the toilet. This reveals the need for a more adaptive and strategic approach to toilet training, especially for children with ASD.

This study is important to carry out to overcome these problems. In this study, the step-by-step process of daytime toilet training in children with ASD is discussed. In this study, the mothers of the children with ASD were involved because the mothers were the primary caregivers. This was very important because outside of teaching sessions, mothers were the ones who spent more time with their children. Smart ABA therapists conducted short training for mothers who will accompany the implementation of toilet training when their children were treated at the clinic. The role of the mother as the primary caregiver is vital in encouraging the success of various abilities of children (Opoku et al., 2024).

This study explained that the Smart ABA technique is implemented if the child has been scheduled to go to the toilet to urinate but does not urinate. The techniques and stages are discussed in the procedure section of this paper. This study aimed to determine the Smart ABA method's effectiveness on independent toilet skills in children with ASD. The results of this study will provide new insights into the independent toilet skills of ASD children. Besides that, it will also provide an in-depth understanding for parents of ASD children, therapists, professionals, and doctors who treat ASD children. Toilet training using the Smart ABA Method is a practical technique that is easy to follow for therapists, practitioners, and parents of children with ASD. Toilet training in ASD children using the Smart ABA Method was reported for the first time in this paper.

## RESEARCH METHODS

This study used an experimental research method: the single-subject Research (SSR) design. SSRs are usually used to evaluate

an intervention (Indra, 2021). The SSR design in this study uses the A-B-A design, which has three stages: Baseline (A-1)/Pre-treatment, Intervention (B), and Post-treatment/Non-treatment (A-2).

The subjects were two ASD children, boys aged 5 and 7 years with a diagnosis of autism. Subjects were treated with the Smart ABA Method in a two-on-one manner (two therapists handling one child). One acted as the therapist, and the other acted as the therapist assistant. It was held at the KID ABA Autism Center in Bekasi, Indonesia, and the subject's home. All subjects in the initial assessment could not respond to the tasks in the initial curriculum. The parents of the subjects in the study followed the guidance of dietary arrangements by the KID-ABA Autism Center team of doctors. Toilet training briefings were also provided to the subject's parents by the KID ABA Autism Center therapy team.

Data collection through observation includes systematic observation and recording of various symptoms and responses in the subject. Observations in this study were carried out to assess the subject's ability. The recording includes scheduling children's toilet time, daytime wetting, and reducing and increasing toilet visit time. As well as scoring the total of children's independent toilet ability. Data analysis using descriptive statistics, to obtain a clear picture of the assessment of children's responses. Data analysis techniques were carried out using visual graphs. According to Richard (Richards, 2018)) in Single Subject Research, graphs play a significant role in the analysis process. The ethical clearance for this study was obtained from the Muslim University of Indonesia (No: 237/A.1/KEP-UMI/VI/2024). Both parents of the subjects gave written consent to participate in the study.

The stages of toilet training (urinating during the day) using the Smart ABA method begin with removing diapers from all children during the Smart ABA therapy session. Removing diapers is very important so that children do not become dependent on diapers and avoid the negative impacts of diapers. Merrill (2015) and Islamiyah et al. (2022) have researched the adverse effects of using diapers for a long time. Smart ABA therapy sessions consist of 4 sessions per day, from 07.00 to 16.00 Western Indonesia Time, Monday through Friday. Meanwhile, the subjects' parents at home carry out on Saturday and Sunday.

One therapy session is 120 minutes, with 90 minutes for the subject to undergo therapy and 30 minutes for the subjects to take a break while the therapist and assistant therapist complete the session report and score the programs carried out according to the programmed curriculum. Parents provide several toy rewards that the subjects like through reward identification that the therapist has previously taught. Parents prepare at least four sets of children's pants and clothes in case daytime wetting occurs during teaching sessions.

Initially, the subjects are allowed to do daytime wetting to get daytime wetting time. The subjects' daytime wetting determines the start of toilet training. For example, the subject's daytime wetting at the 50th, 55th, and 60th minutes in the first three sessions of the start of the therapy. In the next session, the subject is taken to the toilet to urinate around 10 minutes before the daytime wetting, calculated from the earliest time minus 10 minutes. In the example above, it is reduced to 10 minutes before the subject's daytime wetting, namely at the 40th minute, the subject is taken to the toilet to urinate.

When toilet training is about to be carried out, the therapist gives the instruction "pee," and then the subject is prompted by the therapist's assistant to go to the toilet with the subject's parent. In the toilet, for boys, the parent points the child's penis to the toilet while saying *"tuuuuur"* (in Indonesian pronunciation). If successful, the parent gives social rewards or toys that have been provided. If it does not work, the parent pours water on the child's feet; if that does not succeed, the parent pours up to the knees, then the groin, and if still unsuccessful, pour onto the stomach (navel). The pronunciation of *"tuuuuuur"* is done intermittently. If necessary, an additional footrest is used, if the subject is not tall enough to direct his penis into the toilet.

For girls, in the toilet, the parent sits the subject on the toilet while saying *"pesssssss"* (in Indonesian pronunciation). If successful, the parent gives social rewards or toys that have been provided. If it does not work, then pour water, as explained above. The pronunciation of *"pesssssss"* is done intermittently. If necessary, a toilet adapter is used for a very young subject, and a footrest for the subject's feet. Usually, when water is poured onto a subject's stomach, he/she will urinate. Then, the parent flushes the toilet, cleans up the subject's urine, and changes the subject's clothes and pants if

necessary. The subject is returned to the teaching room to resume the Smart ABA therapy session. Furthermore, the 40-minute time setting is observed in 3 consecutive days. If the subject succeeds and does not have daytime wetting until the 40th minute, the start time is increased by adding 5 minutes to each stage. In the example above, the increase is at the 45th, 50th, 55th, 60th, 65th, 70th, 75th, 85th and 90th minutes. The increase in time may vary for each subject.

The stages of water pouring can also be different for each subject. In the example above, the subject may need to be poured with water up to the stomach at the 45–50-minute stage, up to the groin at the 55–60-minute stage, up to the knees at the 65–70-minute stage, up to the feet at the 75–80-minute stage. Whenever the subject successfully urinates just by the parent saying *"tuuuur"/" pessss,"* then there is no need to pour water on the subject's body parts.

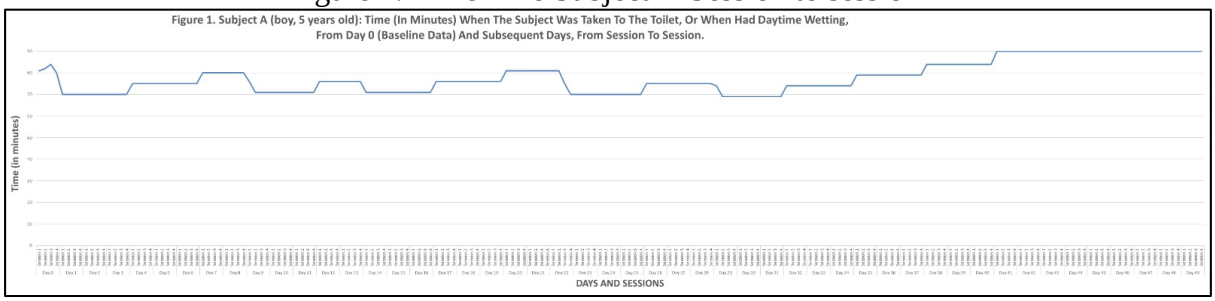
When the toilet training reaches the 90-minute stage, which means when the therapy session is finished, the subject is immediately taken to the toilet to urinate; at this stage, generally pouring water from the feet to the subject's navel is no longer necessary because the subject can already control or hold his/her urination, besides, the subject has been conditioned to urinate when taken into the toilet.

However, suppose it does not work, for example, the subject does daytime wetting at the 60th minute. In that case, in the next session, the toilet training begins by advancing the schedule 5-10 minutes from the last (60th minute) daytime wetting, namely at the 50th or 55th minute. The following implementation is the same as the example above. This time setting can go up and down according to the subject's condition. The therapist must pay attention to the condition of the teaching room and the weather inside and outside, for example, rain and other things that can affect children's daytime wetting. Likewise, children's dietary arrangements, for example, do not comply with the diet of fruits and vegetables high in phenol and others. Giving the child a drink is arranged no later than 10 minutes before the start of the next therapy session. In addition, subjects are routinely taken to the toilet to urinate before starting each therapy session. The entire implementation of toilet training is directly supervised by the Program Director, Consultant, and Supervisor of KID ABA Autism Center.

## RESULTS AND DISCUSSION

All subjects were still wearing diapers at the start of therapy. At the beginning of the therapy, the pampers were immediately removed. The time required by each subject to master toilet training skills varies, as follows.

Figure 1. Time Line Subject A Session to session




### 1. Subject A: 43 days

Daytime wettings of the subject were observed in Smart ABA therapy sessions. In the first day's sessions, daytime wetting was at the 81st, 82nd, 84th, and 80th minutes. The 80th minute was used as the beginning of the intervention minus 10. In the next day's sessions, the subject was taken to the toilet in the 70th minute. The 70th minute was maintained for three consecutive days. The subject did not have daytime wetting. Likewise, when it was increased to the 75th minute, the subject succeeded. However, when it was increased to the 80th minute, daytime wetting on the third day of the first session was in the 76th minute. So, in the next session, the subject was taken out to the toilet in the 71st minute. The subject succeeded without daytime wetting for three consecutive days. Scheduling to the toilet then was increased to the 76th minute. The subjects succeeded without daytime wetting for three consecutive days. The scheduling was increased to the 81st minute. The subject of daytime wetting on the third day of the third session in the 75th minute. So, in the next session, the toilet training schedule was reset to the 70th minute. The subject succeeded without daytime wetting for three consecutive days. When it was increased to the 75th minute, the subject had daytime wetting on the third day in the fourth session at the 74th minute. So, in the next session, the schedule was reset to the 69th minute (74-5). It was then increased to the 74th, 79th, 84th, and 90th minutes. The subjects were successful without daytime wetting on these schedules for three consecutive days each. The 90th minute

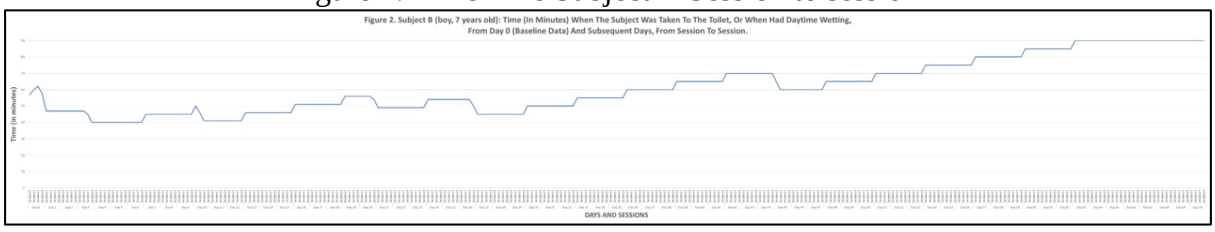
was the end time of each therapy session. Then, after the therapy session was finished (after 90 minutes), the subject's parent took the subject to the toilet to urinate. On the 90-minute schedule, the condition of the subject who did not have daytime wetting could be maintained, namely the subject did not have daytime wetting until the 90th minute for three consecutive days, namely on the 41st to the 43rd day (even when followed until the 49th day). So, from the start of toilet training (July 1, 2024) until the child did not have daytime wetting, it took 43 days. Moreover, it can be maintained for up to two months.

Pouring water to the stomach was done from day 1 to day 7. On the 8th to 12th day, the subject spontaneously urinated when taken to the toilet, without the need for pouring the water on the subject's body part. From the 13th to the 15th day, pouring water to the stomach was needed again. Pouring water was required up to the groin from the 16th to the 20th day. From day 21 to day 23, pouring water up to the knee. From day 24 to day 27, pour water on the feet. After that, starting from the 28th day, no more water was poured because the subject had spontaneously urinated when taken to the toilet. During the toilet training sessions, the subject accidentally had 4 times daytime wetting; those were on day 8th, session 1, day 13th, session 4, day 22nd, session 3, and day 29th, session 1.

**2. Subject B: 65 days**

Daytime wettings of the subject were observed in Smart ABA therapy sessions. In figure 2, the result

Figure 2. Time Line Subject B Session to session




During the first four sessions, the daytime wettings happened in the 57th, 60th, 62nd, and 58 minutes. The 57th minute minus 10 was used as the beginning of the toilet training intervention. In the next session, the subject began to be scheduled to urinate in the 47th minute (57-10). On the third day, the subject accidentally had daytime wetting in the third session at the 45th minute. Then, the toilet training schedule

was rearranged to 45th minus 5 minutes, so the subject was sent to the toilet in the 40th minute. The subject successfully did not have daytime wetting for three consecutive days. Then the schedule for the toilet was increased to 45th minutes. The subject also managed not to have daytime wetting for three consecutive days. The schedule was increased to 50th minutes; but at this stage, the subject accidentally had daytime wetting on the first day of the second session at the 46th minute. The schedule to the toilet was reset again, namely in the 46th - 5 minute, so the subject was scheduled to go to the toilet at the 41st minute. The subject managed not to have daytime wetting for three consecutive days until the 41st minute. The time was increased to 46 and then 51 minutes. The subject also managed not to have daytime wetting within that time. So, the time was increased to 56 minutes, but the subject accidentally had daytime wetting on the second day of the fourth session at the 54th minute. The rescheduling to the toilet became 54th – 5 minutes, which was in the 49th minute. The subject successfully did not have daytime wetting for three consecutive days. The time to send to the toilet was moved to the 54th minute, and then the subject accidentally had daytime wetting on the third day of the fourth session at the 50th minute. The rescheduling to the toilet was at the 50th minus 5 minutes, at the 45th minute. Subjects successfully did not have daytime wetting for three consecutive days. Likewise, when scheduled at 50, 55, 50, 65, and 70 minutes, the subject successfully did not have daytime wetting. At the 75-minute scheduling, daytime wetting on the first day of the first session was at the 65th minute. Rescheduling was repeated at the 65th minus 5 minutes, so the subject was scheduled to go to the toilet at the 60th minute. Starting from the 60th, 65th, 70th, 75th, 80th, 85th, and 90th minutes, the subjects succeeded and did not have daytime wetting on three consecutive days at each stage of the schedule. The 90th minute was the end time of each therapy session. After the therapy session (90 minutes), the subject's parent took the subject to the toilet to urinate. From the start of toilet training (July 3, 2024) until the subject did not have daytime wetting for three consecutive days, it took 65 days. Even when followed for 5 days later and also further up to 2 months, the subject can maintain non-day wetting conditions.

Pouring water up to the stomach from day 1 to day 14. On days 15 to 22, pouring water

is required only up to the subject's groin. Day 23 to day 27 pouring water up to the knee only. From day 38 to day 31, water was poured only on the feet of the subject. Starting from the 32nd day, no more water pouring was carried out because the subject had spontaneously urinated when taken to the toilet. The subject accidentally had daytime wetting 5 times throughout the toilet training intervention: day 3, session 3; day 10, session 2; day 20, session 4; day 26, session 4; and day 45, session 1.

## DISCUSSION

Autism is a severe neurobiological developmental disorder that occurs in children and causes problems in communicating and relating to their environment, starting in the first three years of their life, which continues throughout their life if not intervened. Autism is a neurodevelopmental disorder that causes various problems, including communication, limited interests, and repetitive behaviors (Appah et al., 2024; Bethin et al., 2019; Bommangoudar, 2018; Hodges et al., 2019; Jariwala-Parikh et al., 2019; Jones et al., 2014; Pickles et al., 2020; Rapin & Tuchman, 2008; Safi et al., 2022; Sivayokan et al., 2023; Sun et al., 2019; Tan et al., 2021; Van Laarhoven et al., 2020; Williams et al., 2021). Various disorders and deficits in ASD make it difficult for them to learn various skills that should be important for them to master. One of them is toilet training.

The implementation of toilet training using the techniques in the Smart ABA Method was successful in both subjects, requiring 43 and 65 days for each subject. Pouring water from the feet to the abdomen stimulates the bladder reflex to contract, resulting in urination (urine exiting the bladder). The subjects' parents were fully involved in this study, especially in flushing the toilet, cleaning up the subjects' urination, and changing the subjects' clothes and pants when the subjects experienced daytime wetting or got wet while on the toilet.

Toilet or urination training is a process in which children learn to recognize the signs that they are going to urinate and control them regularly. Then, the children learn to use a toilet to urinate. Toilet training is a difficult skill for both non-ASD children and ASD children. It takes a long time and consistency to train this. The removal of diapers is the most crucial part of this study. At the beginning of this study, the subject's diaper had to be removed. The early cessation of disposable diaper (DD) use is

positively associated with a lower prevalence of bladder and bowel dysfunction (BBD) among children in China (Xu et al., 2021). Some studies on the importance of removing disposable diapers early include Mako (2021) and Bante et al. (2023).

In Dalrymple and Ruble's study (Dalrymple & Ruble, 1992), children with ASD did not begin toilet training until age four and generally took an average of 1.6 years to master the skill of urinating in the toilet. The study of Gubbiotti et al (2022) took approximately six months. Furthermore, Blum et al. 's study (2004) lasted 22 to 54 months. This period reflects individual differences in the toilet learning process. Meanwhile, in the study of Perez et al. (Perez et al., 2020), it is not yet seen how long it will take for the independent toilet to be built.

This study's results showed the effectiveness of the Smart ABA Method in toilet training for children with ASD. The subjects mastered daytime toilet skills within 43 to 65 days and have maintained this for two months. The role of parents is also vital in toilet training for children with ASD. In this study, the subjects' mothers were involved because the mothers were the primary caregivers. This is important because the mother will spend much time with the child later. Smart ABA therapists conducted short training for mothers who would accompany the implementation of toilet training when their children were treated at the clinic. The role of the mother as the primary caregiver is vital in encouraging the success of various abilities of children (Opoku et al., 2024).

The schedule for the toilet in this study was gradually increased, similar to other studies (Cagliani et al., 2021; Carvalho et al., 2022; Greer, 2016), even though the increments were different in this study. The success of both subjects in implementing toilet training using techniques in the Smart ABA Method within 43 and 65 days raises hopes for its implementation in children in other countries.

The Smart ABA technique involves pouring water on the child's feet, knees, groin, and abdomen to stimulate the bladder reflex to contract, resulting in urination (urine exiting the bladder). These techniques must be carried out consistently, including attention to the factors contributing to a child's daytime wetting.

This study highlights how important and complicated toilet training skills are in children with ASD. So, adjustments are needed at various levels. The study

involved developing a technique of flushing water from the feet to the stomach when the child was taken to the toilet to urinate at the scheduled time but not urinating. This Smart ABA technique stimulates the child's bladder reflex to contract so that urinating (urine coming out of the bladder) occurs. The researcher has not found any research that used this technique. This novelty will add knowledge to toilet training skills in ASD children.

## CONCLUSION AND SUGGESTION

### Conclusion

The most important finding of this study was the success of both subjects in toilet training within 43 and 65 days using the techniques in the Smart ABA Method. The technique of pouring water from the feet to the stomach when the subject was taken to the toilet to urinate at the scheduled time but did not urinate was very effective in stimulating the subjects' bladder reflex to contract, resulting in the process of urination (urine exiting the bladder). The results of this study contribute to the ability of children with ASD to go to the toilet independently, and to their families. In addition, the results of this study also contribute to science, especially in the field of autism, benefiting parents, therapists, doctors, and professionals who focus on autism.

### Suggestions

Suggestions for parents/caregivers, therapists, and teachers in implementing toilet training for children with ASD are: (1) Schedule Consistency: Take children to the toilet regularly according to a predetermined schedule to build good habits. (2) Stimulation Technique: Pouring water from the legs to the stomach to stimulate the bladder reflex if the child has not urinated when taken to the toilet. (3) Positive reinforcement: Give praise or small rewards to reinforce positive behavior and increase children's motivation. (4) Comfortable Environment: Ensure child-friendly toilets with appropriate assistive devices to create a sense of safety and comfort. (5) Observation of Signs: Pay attention to physical or behavioral cues that indicate the child's need to urinate. (6) Collaboration: Involve families, therapists, and teachers in a consistent approach to toilet training. (7) Patience: Apply a flexible approach according to the child's readiness. (8) Progress Evaluation: Record and monitor the child's development to adjust strategies if needed.

By implementing this advice, it is hoped that children with ASD can achieve independence in using the toilet, improve their quality of life, and reduce dependence on others.

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