Practical Research

Intensive Supervision for Families Conducting Home-Based Behavioral Treatment for Children with Autism in Malaysia

Koji TAKEUCHI*, Hidemi KUBOTA**, and Jun-ichi YAMAMOTO***

The purpose of the present study was to clarify the type of intensive supervision needed by families who were applying home-based behavioral treatment for children with autism in the absence of constant supervision. Participants were 8 children (age 42–99 months) and their family trainers living in Malaysia. The results of observation sessions prior to the supervision indicated that although the family trainers had learned basic behavioral techniques from manuals and textbooks, the children's correct response rates were relatively low. During the supervising sessions, family trainers received instruction and modeling on the following points: 1) selecting appropriate programs, 2) using strategies to minimize errors, and 3) presenting a variety of rewards. The results showed that after this supervision, the children's correct response rates increased, and the family trainers presented a greater variety of rewards. The results were discussed in terms of 1) teaching techniques that family trainers could learn from manuals and textbooks, 2) necessary supervision, and 3) the general effects of intensive supervision for families conducting home-based behavioral treatment in areas having few professionals.

Key Words: intensive supervision, home-based behavioral treatment, children with autism, Malaysia

Many studies have documented the effectiveness of applied behavior analytic treatment for children with autism and other pervasive developmental disorders (Matson, Benavidez, Compton, Paclawskyj, & Baglio, 1996). Investigators have indicated that applied behavior analytic treatment may yield large benefits for children with autism when implemented intensively (more than 25 hours per week) and early (during the preschool years) (e.g., Anderson, Avery, DiPietro, Edward, & Christian, 1987; Lovaas, 1987).

Though many families have requested intensive and early applied behavior analytic treatment in their home (i.e., home-based behavioral treatment), there have been two major problems for service providers and families (Maurice, 1993; Smith,
K. Takeuchi, H. Kubota, & J. Yamamoto

Buch, & Gamby, 2000). First, the demand far exceeds the supply of professionals who are sufficiently trained in behavior-oriented teaching methods or applied behavior analysis to be able to provide high-quality treatment. Second, it is prohibitively expensive to employ professionals to deliver such intensive treatment.

The most common solution to these problems is for families to do their own home-based behavioral treatment. Family members have to learn how to do this from textbooks, seminars and constant consultation by professionals on how to use the techniques and how to develop treatment plans for their children. When families can effectively implement the techniques, their treatment may substantially enhance their children’s academic and social skills (Sheinkopf & Siegal, 1998; Smith et al., 2000).

In countries that have few professionals, and especially in developing countries, however, most families have not been able to receive seminars and constant consultation. Instead, in such places, families must learn mainly from manuals, textbooks (e.g., Leaf & McEachin, 1999; Lovaas, 1981; Maurice, 1996) and Internet resources. However, when families depend on textbooks, there may be difficulties in the performance of home-based treatment. Thus far, no study has examined whether families who learn these techniques mainly from textbooks can effectively treat their children with autism.

The present study examined the effects of intensive supervision for home-based behavioral treatment that is conducted by Malaysian families who had learned the techniques from textbooks without receiving seminars or consultation. The purpose of the present study was to clarify the role of intensive supervision for such families.

Method

1. Participants

1) Children

Eight children with autism (seven boys and one girl) who lived in Malaysia participated in the present study. The children’s mean chronological age was 62.75 months (range, 42 to 99 months) (see Table 1). The language of all the children was English. Children A, B, and E had no expressive language. Children C, D, F, and H occasionally used a few words or simple sentences to communicate. Child G could speak, but he often repeated the same sentences. According to the parents’ reports, all children could follow simple instructions from their parents, but they often hated to work on tasks.

2) Family Trainers

Children A, B, C, D, and H, and their mothers, and Children E and G and their parents participated. Child F and the caretaker who usually conducted his treatment also participated. We will use the term “family trainers” to refer to all those who participated in the behavioral treatment for the children with autism in the present study.

The family trainers had conducted home-based behavioral treatment using manuals and textbooks, without receiving constant consultation and supervision. All

---156---
<table>
<thead>
<tr>
<th>Ch.</th>
<th>Age</th>
<th>Gender</th>
<th>Period</th>
<th>Daily time of tasks</th>
<th>Person conducting daily tasks</th>
<th>Challenging task</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>3:09</td>
<td>M</td>
<td>6 months</td>
<td>2-3 h/day</td>
<td>Mother</td>
<td>Imitation</td>
</tr>
<tr>
<td>B</td>
<td>5:01</td>
<td>M</td>
<td>1 year</td>
<td>3-4 h/day</td>
<td>Mother &amp; Grandmother</td>
<td>Movements/words</td>
</tr>
<tr>
<td>C</td>
<td>6:06</td>
<td>F</td>
<td>2 years</td>
<td>4 h/day</td>
<td>Mother &amp; 2 Caretakers</td>
<td>Matching</td>
</tr>
<tr>
<td>D</td>
<td>4:09</td>
<td>M</td>
<td>2 years</td>
<td>4 h/day</td>
<td>Mother &amp; Father</td>
<td>Following</td>
</tr>
<tr>
<td>E</td>
<td>8:03</td>
<td>M</td>
<td>1 year</td>
<td>4-5 h/day</td>
<td>2 Caretakers</td>
<td>No response</td>
</tr>
<tr>
<td>F</td>
<td>4:02</td>
<td>M</td>
<td>2 years</td>
<td>3 h/day</td>
<td>Mother &amp; Father</td>
<td>Match-to-sample</td>
</tr>
<tr>
<td>G</td>
<td>5:10</td>
<td>M</td>
<td>10 months</td>
<td>4 h/day</td>
<td>Mother &amp; Father</td>
<td>Labels</td>
</tr>
<tr>
<td>H</td>
<td>3:06</td>
<td>M</td>
<td></td>
<td>3-6 h/day</td>
<td>Mother</td>
<td>Match-to-sample</td>
</tr>
</tbody>
</table>

**TABLE 1**: Profile of children and data from questionnaire.
the family trainers were members of a local family organization. The family trainers had exchanged a lot of information about behavioral treatment with other members. The family trainers had also sent requests to authors to get advice and consultation about practical techniques and effective tasks.

The parents of the eight children gave their permission for the present authors to document the data of the present study.

3) Supervisor and Assistants

The supervisor was a Japanese professional (the third author) who has engaged in therapy with children with autism for 20 years. Two Japanese assistants (the first author, who was in doctoral course of disability science, and the second author, who is a community-based clinician with a master’s degree in education) helped the supervisor to give the family trainers advice and correct models.

2. Setting

The study was conducted in private session rooms (approximately $4 \times 4$ m) of the local family organization in Malaysia. There was a desk, at which the children and family trainers sat facing each other, working on tasks. All sessions were recorded by two videocassette recorders.

3. Procedure

1) Questionnaire

Mothers were asked to complete a questionnaire designed to collect information about the family trainer who conducted the daily tasks, the period and daily (weekly) time of conducting the tasks, and challenging tasks that the children had not been able to master.

2) Direct observation

We had three 20-min direct observation sessions in two days (i.e., a total of 1 hour). In the session rooms, we directly observed each family trainer conducting the challenging tasks identified from the questionnaire (see Table 1) with the child. Child E and his parents did a matching-to-sample task, because that family did not return the questionnaire.

3) Supervision

After this direct observation, the supervisor and the assistants gave the family trainers much advice and did correct modeling during nine 20-min supervising sessions in three days (i.e., a total of 3 hours). During the supervising sessions, the family trainers received supervision while they conducted three kinds of tasks. The tasks were as follows: 1) imitation of sounds and words that required the children to vocalize the sounds and words that the family trainers said, 2) matching-to-sample of colors and shapes, in which the children handed the family trainers a colored piece of material or a card (e.g., circle, triangle) after the family trainer had stated the item’s name (e.g., “give me red” or “give me circle”), and 3) instruction-following, which required the children to follow the verbal instructions of the family trainers (e.g., “Please go to kitchen, and bring me a towel”).
Intensive Supervision for Home-based Behavioral Treatment

4. Data collection

1) Correct Responses and Variety of Rewards

The percentage of correct responses to trials on the tasks during the first 20-min direct observation session and the final 20-min supervising session was calculated. The criteria for a correct response were different for each task. During the same sessions, categories of reward presented by the family trainers were also assessed. In the case of Children E and G, their mothers and fathers participated in the sessions as family trainers, so both parents’ behavior was assessed. The rewards were classified into six categories: food and drink (e.g., fruit, chips, or water), sensory stimuli (e.g., tickling), play and toys, vocal praise (e.g., “good job”), clapping and cheering (“hip,
K. Takeuchi, H. Kubota, & J. Yamamoto

hip, hooray!”), and describing the correct response (e.g., “yes, this is the red one”).

2) Social Validity of the Participants’ Change

After the supervising sessions were completed, two samples were made from the videotapes of the interactions between the family trainers and their children. One of the samples consisted of the first 5-min of the direct observation sessions, and the other, the final 5-min of the supervising sessions. 10 observers (Japanese college students) watched both videotapes. The two videotapes were presented in random order (either first to final, or vice versa). After watching the videotapes, the students answered 14 questions by checking one of five choices on Likert-type items: “I do not agree at all” (1 point), “I don’t agree or disagree” (3 points), “I agree completely” (5 points). Fourteen questions (10 positive, and 4 negative) were categorized into three categories (see Fig.1): 1) the child's behavior (e.g., “the child makes many errors,” “the child responds to instructions”), 2) the family trainer’s behavior (e.g., “the family trainer praises the child’s response well,” “the family trainer says negative words frequently”), and 3) the interaction between the child and the family trainer (e.g., “the interaction between the child and the family trainer is smooth” “the procedure for the tasks is easy to understand”). In the case of Children E and G, both of their parents (mother and father) were observed working with their children as family trainers. For each participant, we took the average score of the 10 observers in the first and final sessions on each item of the questionnaire. Each score was tested by paired t tests.

3) Reliability

Two observers recorded the number of correct responses and six kinds of rewards during the first 20-min direct observation sessions and the final 20-min supervising sessions. Inter-observer agreement was assessed for all of the sessions. Mean agreement for the number of correct responses was 99.5%. Overall mean agreement for rewards was 98.8%.

Results

1. Questionnaire Survey

Table 1 presents the results of the questionnaire survey and also lists the challenging tasks. The results revealed that each child usually had 1–3 persons conducting the treatment. Daily tasks had continued for 5–24 months, with training almost every day, 2–5 hours per day. The challenging tasks could be classified into three main categories: imitation, matching-to-sample, and instruction-following.

2. Supervision

For each participant, the supervisor did the following: 1) He instructed the family trainers how to select appropriate tasks for their child’s performance level (e.g., selecting sounds in the child’s vocal repertoire for teaching vocal imitation). 2) He instructed the family trainers about using a most-to-least prompt-fading strategy for errorless learning. In the most-to-least prompt-fading strategy, the children received
the minimum amount of assistance needed for them to perform the tasks successfully. Over successive trials, the amount of assistance was gradually reduced until no prompt was provided. 3) He presented various rewards as a model (e.g., clapping, tickling, vocal praising, toy, and playing). In addition, he explained that variety, clarity, and immediate delivery of rewards were very important.

3. Correct Responses and the Variety of Rewards

Figure 2 shows the percentage of correct responses made by the children, and the variety of rewards presented by family trainers during the first direct observation session and the final supervising session. For all children, the percentage of correct responses increased in the final session, compared to the first one. The range of percentage of correct responses was 29–57% (M=45%) in the first session, and 64–98% (M=87%) in the final session.

The only exception was Child C, who showed relatively little improvement. The percentage of correct responses by Child C was 55% in the first and 64% in the final session.

All family trainers presented a greater variety of rewards in the final session compared to the first session. In particular, describing the correct response, and clapping and cheering, increased during the final session for most of the family trainers.

4. Social Validity of the Improvement of the Children and the Family Trainers

Figure 1 shows the results from the assessment of the social validity of the improvement of children and the family trainers, and the interaction between them.

![Graph showing percentage of correct responses and variety of rewards](image-url)
K. Takeuchi, H. Kubota, & J. Yamamoto

All children and family trainers showed positive improvement in most of the questions during the final session. Statistically significant improvement was shown by Child A for 10 items, by Child B for 5 items, by Child C for 7 items, by Child D for 13 items, by Child E for 14 items, by Child F for 11 items, by Child G for 7 items, and by Child H for 9 items, out of the 14 question items. For example, the ten questions on which Child A and his mother showed statistically significant improvement were “Child is bored #”, “Child looks so happy”, “Child makes many error responses #”, “Child is not willing to do #”, “Child understands tasks”, “Child is interested in tasks”, “Family trainer praises child’s response well”, “Family trainer looks so happy”, “Family trainer assists child to work successfully”, and “Interaction of child and family trainer is smooth.” (Reversal items are represented by #.)

The questions on which the average score of all children and family trainers was more than 3 points in the first session were the following: 1) question 4, “Family trainer praises child’s response well,” an average score of 3.0 points, 2) question 7, “Family trainer say negative words frequently (# reversal item),” 3.4 points, 3) question 8, “Procedure of tasks is easy to understand,” 3.1 points, and 4) question 10, “Child responds to instructions,” 3.4 points. These four questions got a relatively higher score than the other items in the first session.

Discussion

The present study examined effects of intensive supervision for families who, prior to this supervision, had been conducting home-based behavioral treatment for their children with autism mainly by using manuals and textbooks. The results of social validity tests showed that the children and family trainers who participated in the present study performed some tasks adequately in the first session. Referring only to manuals and textbooks, the family trainers had learned some basic techniques of behavioral treatment, such as promoting children’s responses by implementing tasks with discrete trials, praising correct responses, and avoiding the use of negative words.

However, although the family trainers had correctly implemented basic behavioral techniques, the results shown in Fig. 1 (question 5) and Fig. 2 indicate that the children’s correct response rate was relatively low (M=45%) in the first session. The results from direct observation indicated that three major problems caused the children’s low rate of correct responses. First, the tasks that the family trainers selected and implemented were too difficult for the children. Though the family trainers implemented procedures properly, and the children followed their instructions, the family trainers had failed to select tasks that were appropriate for the children’s performance level. Second, the family trainers had taught their children using a trial-and-error procedure, without applying errorless learning methodology. The results on question 11 shown in Fig. 1 suggested that during the first session, the family trainers of Children E, G, and H in particular did not assist their children to perform tasks without errors. Third, a variety of rewards was lacking. Most of the
Intensive Supervision for Home-based Behavioral Treatment

family trainers used vocal praise appropriately as a reward, but the rewards were relatively lacking in variety (fewer than 3 kinds) in the first session (see Fig. 2). These kinds of problems would be likely to cause a decrease in the rate of correct responses and failure of attention to the tasks. The low scores shown on questions 2, 12, and 14 in Fig. 1 suggested that off-task behavior and self-stimulatory behavior occurred often during the first session. We also observed these behaviors when watching videotapes of the training.

The family trainers had to learn to deal with these problems. When a task was beyond a child's performance level, the family trainer may have to change the task. When a child could not learn merely by repeating the task using a trial-and-error procedure, the family trainer should implement an errorless learning strategy. When vocal praise was ineffective in improving a child's performance, the family trainer should implement other rewards that might be more effective reinforcers.

In the supervising session, we supplied the family trainers with instruction and modeling by a professional supervisor in regard to the three problems mentioned above. The results were that the children's correct response rates improved, and the variety of rewards offered by the family trainers increased.

In addition, the results of the social validity check indicated that the effects of the supervision were obvious to people who were not related to the present study. The scores on questions 2, 11, 12, and 14 increased in the final session. This suggests that in the final session, the family trainers used a prompting strategy for minimizing children's errors, and children's off-task behavior and self-stimulatory behavior was reduced.

An exception to these results is that only a slight increase in the rate of correct responses was found in Child C. The mother of Child C selected tasks with a higher level than the child's current performance, even after the supervising sessions. The case of Child C suggests that it is sometimes difficult for family trainers to select appropriate target tasks.

In the present study, the family trainers received intensive supervision for 4 hours (i.e., 1 hour of observation and 3 hours of supervision). We found that this much intensive supervision had the effect of improving home-based behavioral treatment conducted by family trainers who had originally learned basic techniques according to manuals and textbooks.

Effective supervision for a short period may be practical in other countries, as well. Though the present study examined intensive supervision for Malaysian families, similar supervision may be effective in other developing countries using the following program: 1) first learning teaching techniques from manuals and textbooks that are popular and standard, and 2) later receiving supervising sessions, as in the present study. In addition to being a useful method for developing countries, a similar supervision method may also be effective in areas that lack professionals who have the knowledge and skills necessary to provide high-quality training. Further research on this type of support will be needed in other places.

After the supervising sessions were completed, we conducted interviews with the
K. Takeuchi, H. Kubota, & J. Yamamoto

participants in the present program. The mother of Child H said, "He can do tasks highly successfully now." The mothers of Children B, C, and G said, "My child looks happy." The mothers of Children A, E, and F said, "He can learn in a relaxed mood." Seven months later, we heard from a leader of the local family organization that the teaching techniques that had been taught by the supervisor, particularly the most-to-least prompting strategy, were very useful.

A future direction for this study will be to examine the long-term effects of intensive supervision and a way of providing continuous support in distant countries.

Acknowledgments

We thank to all members of the PR4A (Parent Resources for Autism) in Malaysia, particularly, the family trainers and the caretaker who participated in the present study. We also thank Tai Lee Ming, Mitsuko Nasuno, Yuko Amitani, and Rie Endo for their assistance in coordination and their encouragement.

References


—Received December 4, 2001; Accepted February 14, 2002—

—164—