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Research on Changes in the Emotions and Behavior of School-Refusing Children With Water-Based Nail Treatments—Intervention in a Place for School-Refusing Children and Examination of Its Effects*

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This study examined the positive changes that water-based nail treatments can bring to emotions and behavior in children who do not attend school and use a place for school-refusing children. Children who do not attend school and use a place for school-refusing children were given water-based nail treatments about once a week for three months. In addition, the parents of these children were asked to respond to questions about their children's daily activities. The results showed that natural communication through nail treatments significantly increased positive emotions. However, continued nail treatments did not reduce the children's problem behaviors. Some children returned to school, while others continued not attending school. Increased frequency of visits and number of treatments confirmed the promotion of communication. It was suggested that building positive relationships with family and supporters is important for achieving sustained effects from nail treatments. This study showed that nail treatments are a useful tool for promoting positive emotions, self-acceptance, and social skills, and may contribute to the emotional growth and social interest of children who do not attend school.

Keywords: interventional study, children not attending school, water-based nail polish, Diagram of Mood States (DMS), Child Behavior Checklist (CBCL), emotional and behavioral changes

Introduction

In regard to the psychological effects of receiving nail treatments, Mizuno and Sakai (2025) examined the changes in emotions and behavior caused by water-based nail treatments in children residing in child welfare facilities. As a result, after water-based nail treatments, there was a strong tendency for "feeling energetic", "feeling relaxed", and "feeling comfortable" to increase, and this continued even after time had passed. In addition, nail treatments increased communication and interaction with facility staff and other children in the facility, promoted self-expression, and increased a sense of accomplishment, acceptance from others, and self-

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affirmation. These results suggest that positive emotions may persist even after nail treatments, and that daily life may change in a positive way.

Sato (2018) conducted a nail coloring intervention on elderly people with dementia and examined changes in BPSD (Behavioral and Psychological Symptoms of Dementia) and QOL (Quality of Life) through a randomized controlled trial. After randomly allocating the participants to two groups, the intervention group received nail coloring interventions twice a week for three months. A two-dimensional analysis of variance was used to compare the two groups, and a significant interaction was confirmed in the expected items related to BPSD and QOL, suggesting the possibility of reducing BPSD.

The purpose of this study is to clarify whether children who are not attending school and have psychological difficulties will positively change their emotions and problem behaviors in daily life by providing nail treatments. A survey will be conducted on children who are not attending school and who use a place for school-refusing children. The following hypotheses were made: (1) Natural skin contact and communication through nail treatments will lead to positive emotions. (2) Regular nail intervention for three months will lead to positive emotions and enable children to go to school instead of not attending school. Communication with friends and family will increase, and interest in colors and designs will increase. (3) By interacting with the target children for three months, they will become familiar with the author and build a relationship with the author, and the effectiveness of nail treatments will be greater two months after the initial treatment.

Methods

Water-based nail treatments were administered approximately once a week. Children and participating guardians were asked to answer face sheets, before and after the water-based nail treatment. In addition, unstructured interviews were conducted with three guardians and facility staff.

Survey Period

Three months from January 25 to April 26, 2023.

Survey Participants

Table 1 shows the six children who responded to this survey. There were six children, including five elementary and junior high school students aged six to 13 years old who were absent from school and one child who was attending school, living in the Kansai region, and four parents of the children.

Table 1

Six Respondents to This Survey

Children	Age	Sex	Number of nail treatments
A	11	Girl	11
B	13	Girl	4
C	11	Boy	7
D	13	Boy	1
E	6	Girl	3 (DMS answer: 2)
F	6	Girl	2 (DMS answer: 1)

Stimuli

The nail paints used in this survey were about 30 colors from Ueba Esou Co., Ltd.—Gofun Nail, Sobi Japan Co., Ltd.—Ai Treatment Care Nail, and other companies' products. Survey participants were able to choose from

about 30 nail colors in consultation with the survey implementer who performed the nail treatment, select their favorite art from the nail design, and further arrange it in their own way, choosing a variety of colors and designs (Mizuno & Sakai, 2025).

We asked participants to answer the following Steps 1 to 3 to examine the changes in their feelings and behavior due to nail treatment.

1. We asked participants to answer a face sheet (including the age, grade, and gender of the survey participants).

2. Participants were asked to complete a Diagram of Mood States (DMS) at three time points: before the water-based nail treatment, immediately after the treatment, and one to six hours after the treatment (hereafter referred to as 1-6 hours after treatment), to examine the effects on mood and emotions. The timing of responses varied depending on the survey participants at 1-6 hours after treatment. The time required to respond at each time point was approximately 30 seconds. This scale is possible for even five-year-old children to complete.

3. Parents of the participating children were asked to complete the Child Behavior Checklist (CBCL) once a month. The CBCL is a checklist in which the greater the number and severity of problem behaviors, the higher the score. In addition, unstructured interviews were conducted with three parents and facility staff.

Ethical Considerations

Informed consent was obtained from the children and from their guardians. The process of the nail treatment was explained to the participating children in advance, and they were told that they could stop midway, that it was not compulsory, and that they could participate only when they wanted to. The time for the nail treatment and the time for the children to choose their nail color and design were also adjusted to suit the children's pace.

At the time of the survey, the novel coronavirus (COVID-19) was spreading, so the author had received the COVID-19 vaccine and performed the nail treatment while taking thorough infection prevention measures.

This study was conducted with the approval of the ethical review board at the author's affiliated institution (approval number: 202204).

Results

Table 2 shows the results of the first DMS for the six children, and Table 3 shows the frequency of occurrence of problem behaviors on the CBCL for the six children. Each section describes the results for each child, from Child A to Child F.

Table 2

Evaluation Results Before and After the First DMS Nail Treatment

	Feeling good			Feeling relaxed			Feeling comfortable		
Children	Before	Immediately after	1 to 6 hours later	Before	Immediately after	1 to 6 hours later	Before	Immediately after	1 to 6 hours later
A	6	7	10	7	8	8	13	15	18
B	5	7	8	5	6	7	10	13	15
C	6	7	9	6	7	9	12	14	18
D	7	8	10	8	9	9	15	17	19
E	5	7	5	5	5	5	10	12	10
F	5	7	7	5	7	7	10	14	14
Mean	5.7	7.2	8.2	6.0	7.0	7.5	11.7	14.2	15.7

Table 3

Number of Occurrences of CBCL Problem Behaviors for Six Children

Children	Number of times	Anxiety/ depression	Social withdrawal/ depression	Somatic complaints	Attention issues	Illegal behavior	Social issues	Thought Problems	Aggressive behavior	Other issues
A	1	7	6	3	9	4	6	3	9	2
	2	5	3	1	9	1	6	1	6	3
	3	9	5	1	9	3	4	1	8	3
	4	6	3	1	8	1	4	0	6	3
B	1	5	5	3	10	10	1	6	6	7
	2	1	2	3	9	6	1	6	3	8
C	1	6	4	0	12	0	3	1	2	1
	2	13	6	2	11	4	3	1	5	0
	3	12	5	1	8	3	3	2	3	3
	4	11	5	1	10	3	2	1	4	3
D	1	5	4	1	11	4	1	1	5	0
	2	9	6	0	10	4	6	1	5	0
	3	8	3	0	8	3	2	0	2	1
	4	9	6	1	9	4	5	0	6	0
E	1	2	0	0	1	0	2	1	2	0
	2	1	0	0	0	0	0	0	0	0
	3	1	0	0	0	0	1	0	1	0
F	1	0	0	0	1	0	0	0	0	0
	2	0	0	0	0	0	0	0	1	0
	3	0	0	0	1	0	0	0	0	0
Mean	1	4.2	3.2	1.2	7.3	3.0	2.2	2.0	4.0	1.7
	2	4.8	2.8	1.0	6.5	2.5	2.7	1.5	3.3	1.8
	3	6.0	2.6	0.4	5.2	1.8	2.0	0.6	2.8	1.4
	4	8.7	4.7	1.0	9.0	2.7	3.7	0.3	5.3	2.0

Child A

She was 11 years old, 6th grade, female. School absenteeism was since 2nd grade. Illness was not specified. She was planned to advance to special support class from junior high school. Number of surveys was DMS 11 times (response obtained at each visit) and CBCL 4 times. Survey dates were January 25th, February 1st, 5th, 22nd, March 1st, 8th, 15th, 29th, April 5th, 12th, 19th (forgot to respond), 25th.

In Table 2, the “comfortable feeling” was higher after nails in the first and second surveys than before. However, from the third survey to the last day of the survey, the “comfortable feeling” was lower after nails than before than in the first and second surveys. From the third survey onwards, the score was five or higher.

In Table 3, there was little change in “anxiety/depression” before and after the survey. On the other hand, “social withdrawal/depression”, “physical complaints”, “attention problems”, “rule-breaking behavior”, “social problems”, “thinking problems”, and “aggressive behavior” showed a tendency to decrease from pre-survey to post-survey. “Other problems” tended to increase from pre-survey to post-survey. A slight increase in the value was confirmed for one of the nine CBCL items. However, a slight decrease in the value was confirmed for eight of the nine CBCL items.

In analysis of interview, changes in emotions were happiness, joy, pleasure. Changes in behavior were increased communication within the family, increased interest in colors, increased self-expression, motivation, and curiosity.

In discussion, in Table 2, “feeling comfortable” increased after nail treatment compared to before, and emotions became more positive due to nail treatment. However, from the third time onwards, there were three times when the patient answered “all 7 today” in a lump sum before the treatment, and there were also more appropriate answers. Although the child appeared to simplify her answers, she participated in all 11 nail treatments during her visits, and in the parent interview, she said, “I think I’ll do this next week”, suggesting that she was looking forward to the next nail treatment. In Table 2, the scores for seven problem behavior items decreased with each visit, and the parents evaluated that the child’s behavior had changed positively.

During the first treatment, the child took time to choose the nail color and design, but this became faster with each visit. The parent interview also revealed that the child had thought about what kind of nail treatment he wanted for the next place for school-refusing children. After the nail treatment, the child showed the nails to the parents, and was happy to be praised for being “cute”, which increased communication between the parent and child.

During the treatment, the child was initially reserved, but became more proactive with each visit. After the ninth visit, when the child sat down, she succinctly stated her wishes, such as “I want this color and this design”, and received the treatment while watching the video on the iPad. She entrusted only her hands to the author, and was satisfied when she checked the nails when they were completed. It is considered that the relationship between the child and the author became more familiar through the nail treatment. Although the answers were appropriate, it appears that the child seemed to feel at ease as he handed his hand to the author towards the end.

Child B

She was 13 years old, 1st year junior high school student. School absenteeism was since 2nd grade. Illness was developmental disorder (Autism Spectrum Disorder; ASD, suspected Learning Disabilities; LD). Number of surveys was 4 DMS surveys (answers obtained at each visit), 2 CBCL surveys. Survey dates were January 25th, February 1st, 15th, 22nd, March 1st.

In Table 2, “feeling comfortable” increased after nails compared to before. However, although the score was six or higher from the second survey, on the final day of the survey, the score was lower after nails than before.

In the average scores of the two CBCL surveys in Table 3, there was little change before and after the survey for “physical complaints”, “social problems”, and “thinking problems”. On the other hand, “anxiety/depression”, “social withdrawal/depression”, “attention problems”, “rule-breaking behavior”, and “aggressive behavior” showed a tendency to decrease compared to before the survey. In addition, “other problems” showed a tendency to increase from before to after the survey.

There was no survey of interview.

In discussion, in Table 2, “feelings of comfort” increased after the first nail treatment compared to before, and the nail treatment made her emotions more positive. From the second time onwards, the score was six or higher.

In Table 3, there was little change before and after the survey for “physical complaints”, “social problems”, and “thinking problems”. On the other hand, “anxiety/depression”, “social withdrawal/depression”, “attention problems”, “rule-breaking behavior”, and “aggressive behavior” showed a downward trend before and after the survey. In addition, “other problems” showed an upward trend from before to after the survey.

In the first nail treatment, it took time to choose the nail color and design, and the conversation was modest at first, but the selection became faster and the conversation became more active with each visit. It is considered

that the relationship with the author became more familiar through the nail treatment. When she saw the completed nails, she smiled and said, “They’re so cute”, but it is assumed that she was not sure how to express her detailed feelings in her DMS responses. It is considered that the nail treatment brought about positive emotions for Child B.

After March 8, Child B stopped coming to the place for school-refusing children. According to interviews with facility staff, Child B felt uncomfortable because he felt like an adult and immature compared to the other children.

Child C (Child C and Child D Were Siblings)

He was 11 years old, 5th grade. School absenteeism was since 1st grade. Illness was developmental disorder (ASD, Attention-Deficit / Hyperactivity Disorder; ADHD). Number of surveys was DMS 7 times (answers were obtained at each visit), CBCL 4 times. Survey dates were January 25, February 15, 22, March 1, 15, April 5, 12.

In Table 2, “feeling comfortable” increased after nails compared to before. However, from the second time onwards, these feelings became lower than the first time. From the second time onwards, it seemed like he was bothered to answer the questions, and there were scenes where he would respond casually before the nail treatment, such as “I’ll give you five points today”.

In Table 3, there was little change in “social withdrawal/depression”, “thinking problems”, and “aggressive behavior” before and after the survey. “Attention problems”, “rule-breaking behavior”, and “social problems” showed a tendency to decrease before and after the survey. In addition, “anxiety/depression”, “physical complaints”, and “other problems” showed a slight tendency to increase before and after the survey.

In analysis of interview, changes in emotions were increase in joy, enjoyment, relaxation, and positive feelings. Changes in behavior were increase in communication within the family, increased interest in colors, increased self-expression, motivation, and curiosity.

In discussion, in Table 2, “feeling comfortable” increased after nails compared to before, showing positive changes. However, from the second time onwards, there was an increase in responses such as “all fives today”, and some inappropriate responses were also seen.

In Table 3, some items showed a decrease in problem behavior, but some items showed no change and some items showed an increase. Parents did not evaluate their children’s behavior as having changed positively. On the other hand, the child participated in all seven nail treatments, and in an interview with her guardian, she reported that she treated her nails as important items, “keeping the nail polish off for a while after peeling it off”, and that she “quizzed her mother on the color of her nails”, and that she wanted nail stickers of her mother’s favorite character. This confirmed that the child wanted to please her mother and that communication with her family had increased. On the first visit, it took time for the child to choose the nail color and design, but with each visit it became quicker and it was also observed that the child was looking forward to the next visit, saying, “Maybe I’ll do this next week”. In conversation with the author, the child was initially reserved, but became more proactive as the treatment progressed. Although the child’s answers were vague, this suggests that the child had positive feelings.

Child D

He was 13 years old, 2nd year junior high school student, absent from school since 6th grade. Illness was enrolled in support class for developmental disorders (ASD, ADHD). Number of surveys was one though he visited four times. Survey date was January 25th.

In Table 2, after only one survey, “feeling comfortable” increased after nails compared to before. Child D answered that he wanted to try nails, so he did it once, and he did not need to do it again after the second time.

In Table 3, there was little change before and after the survey for “physical complaints”, “attention problems”, “rule-breaking behavior”, “thinking problems”, “aggressive behavior”, and “other problems”. On the other hand, there was a slight increase in “anxiety/depression”, “social withdrawal/depression”, and “social problems” before and after the survey. None of the nine items decreased.

In analysis of interview, changes in behavior were growth, consideration for others.

In discussion, the nail treatment was only done once, and in the DMS responses in Table 2, “feeling energetic”, “feeling relaxed”, and “feeling comfortable” increased after the nail treatment compared to before, indicating that the nail treatment made the emotions more positive.

In Table 3, in the transition from before to after the survey, some problem behaviors decreased, but some items did not change and some items increased. From the parents’ perspective, the child’s behavior did not change much in a positive way. In the interview with the parents, it was said that Child D was not good at interacting with people from a young age, so it was good that it was only a one-time experience. For Child D, who is not good at interacting with others, the experience of wanting to receive a nail treatment was a good one.

Child E (Child E and Child F Were Sisters)

She was six years old, first grade. School absenteeism was from September of first grade. Illness was not specified. Number of surveys was DMS two times and CBCL three times. Treatment was performed every time the child visited the facility. Responses were stopped midway through the third response. Survey dates were February 2nd and 15th.

In Table 2, it was difficult to answer the DMS, so after the third time, the answering was stopped.

In Table 3, there was little change before and after the survey for “anxiety/depression”, “attention problems”, and “other problems”. On the other hand, “withdrawal/depression”, “somatic complaints”, “rule-breaking behavior”, “social problems”, “thinking problems”, and “aggressive behavior” tended to decrease from before to after the survey.

In analysis of interview, changes in emotions were joy, enjoyment, relaxation, and increased positivity. Changes in behavior were attending school, increased communication within the family, increased interest in colors, self-expression, motivation, and curiosity, no longer fighting with sisters.

In discussion, Child E visited the center three times, and requested and received nail treatments at every visit, but he had difficulty answering the DMS, so he stopped answering after the third visit. We believe that answering about feelings was a burden. From the parent interview, it was said that he had difficulty verbalizing his own feelings. On the other hand, during the conversation with the author while the nail treatment was being done, the child talked about her nails and herself in a fun way.

Table 3 shows that the scores for the three problem behavior items decreased in the three responses before and after the survey, especially “anxiety/depression”. The parents evaluated that the child’s behavior had changed positively. According to the parent interview, the child felt joy by receiving the nail treatment, and it improved communication with family and self-esteem. In addition, for Child E, who was in the middle of recovery from not attending school, the nail treatment produced positive emotions and was one of the factors that led to her

attending school. Child E and Child F are sisters, and it is thought that the sisters' fights ended because Child E felt positive emotions and acted positively.

Child F

She was six years old, first grade, attending school. Illness was not specified. Number of surveys was DMS one time and CBCL three times. She visited the facility three times. Survey date was February 2.

In Table 2, in the first survey, "feeling comfortable" increased after nail treatment compared to before. In the second survey, she had a nail treatment but did not respond. In the third survey, she did not have a nail treatment or respond to any questions.

In Table 3, "anxiety/depression", "social withdrawal/depression", "somatic complaints", "attention problems", "rule-breaking behavior", "social problems", "thinking problems", "aggressive behavior", and "other problems" showed low results before and after the survey, with no change.

In analysis of interview, changes in behavior were attending school, increased communication within the family, no longer fighting with sisters.

In discussion, she only had a nail treatment once, and in the DMS responses after her nail treatment, "feeling energetic", "feeling relaxed", and "feeling comfortable" increased, indicating that her emotions had become more positive. However, although she visited the clinic three times, she only had a nail treatment twice, and on the third visit, she said she "just wanted to look", and did not have a treatment. The reason for this is that, although she said she "had her own nail set", she found it difficult to answer questions about her feelings in the DMS responses. In the parent interviews, it was also noted that the children had difficulty verbalizing their feelings.

In Table 3, in the three responses, there were few problem behaviors, and the parents also evaluated that the nail treatment had positively changed the children's behavior.

Summary of Results

A one-way analysis of variance was used to verify whether there were significant differences in the DMS results for all survey participants in Table 2 between before nail treatment, immediately after nail treatment, and after nail treatment (1-6 hours). As a result, significant differences were observed at the 1% level for all factors: "feeling energetic" ($F(2, 10) = 10.6$, $p < 0.01$), "feeling relaxed" ($F(2, 10) = 9.5$, $p < 0.01$), and "feeling comfortable" ($F(2, 10) = 15.0$, $p < 0.01$).

In the CBCL graphs in Table 3 for the survey participants excluding Child D, the nine items were grouped into "decreased", "increased", and "no change". The results were as follows.

Decreased: "withdrawal/depression": three people, "somatic complaints": two people, "attention problems": two people, "improper behavior": three people, "social problems": two people, "thinking problems": two people, "aggressive behavior": two people.

Increased: "other problems": three people, "anxiety/depression": one person, "somatic complaints": one person.

No change: "anxiety/depression": three people, "social complaints": two people, "social problems": two people, "thinking problems": three people, "withdrawal/depression": two people, "aggressive behavior": two people, "attention problems": two people, "other problems": two people, "improper behavior": 1 person.

Discussion

In this study, Hypotheses 1 and 3 were supported. Although school-refusing children have little contact with others because they spend their time in limited spaces such as their home or a place for school-refusing children,

nail treatments maintain their interest, and as with the results of Mizuno and Sakai's (2025) study, increased communication with family and sustained positive emotions were confirmed. On the other hand, Hypothesis 2 was not supported. One of the five school-refusing children resumed attending school, but the other four continued to be absent from school. In the CBCL analysis, the reduction in problem behavior was not clear, and not all problems were solved. Since there are children who are not motivated by the treatments, it is important for families and supporters to build positive relationships to achieve lasting effects.

This study was a three-month longitudinal survey, but it was like Mizuno and Sakai (2025) in that the DMS responses in Table 2 showed positive feelings. In this study, interest in nail treatments was maintained, and by continuing to engage through nail treatments, results like those of a study of elderly people with dementia by Sato (2018) were obtained. In addition, several children responded that they felt good during the treatment, and some children felt comfortable and happy when their hands touched the author's hands during the treatment. Like the touch care introduced by Yamamoto (2014) for pain relief, anxiety reduction, and relaxation, treatment of the hand area was found to have a relaxing effect.

The CBCL analysis results in Table 3 did not confirm a decrease in problem behaviors. Nine problem behaviors were "no change". Seven problem behaviors were "decreased", with a slight decrease. Three problem behaviors were "increased", but only slightly. This is thought to be influenced by the background of children who do not attend school, including those with autism spectrum disorder and developmental disorders. While nail treatments contribute to the development of sensitivity and improved communication in some children, they are not considered to be equally effective in solving all problems in daily life.

The children sometimes begin to talk about their thoughts during the treatment, and the author found that listening to them deepened the relationship. Murase (2009) discussed the importance of the therapist as a listener, and specifically stated that in order for children to regain something to rely on within themselves, (1) they need to regain their footing as a recognized and irreplaceable presence; (2) they need to feel someone who is watching over them and listen to them; and (3) they need to find a way to heal their own hearts, which means they need to have a wide range of interests outside of schoolwork and become an open presence. These were naturally achieved through the nail treatments.

Positive feelings were generated not only in the children but also in their families. Mita (2008) stated that "beauty" not only brightens the mood of the person themselves, but also the people around them, and that even if the person is elderly and bedridden, their family will be happy if they keep themselves well-groomed. In this study, as in Mita (2008), it was found that beauty became a topic of conversation within the facility and at home, and that it helped to improve relationships.

It is rare for children to be able to freely choose the color and design of their nails when they are treated by a manicurist, so this was a fresh experience for them. It was found that the children seriously chose the color and design and decorated their bodies. It is also important that in the process of choosing, the children developed a desire and hope to have nails that reflected "cute" and "cool", and that they made the decision of their own volition. The completed nails were done by the author, but the children chose the color and design, and thought about and decided which art to put on which finger. It was found that these self-determinations allowed the children to feel a sense of accomplishment and satisfaction from the feeling of "cute" and "cool". In relation to this self-determination, Kawada and Koike (2021) pointed out that fostering self-determination is a way to support children who do not attend school. In this study, the children were naturally encouraged to make their own decisions, and were able to choose from about 30 nail designs, select their favorite art, and arrange them in

their own way. Furthermore, many children commented, “Next time, I want to do this color”, and “I want to do it again”, and their interest in color increased. Furthermore, the children’s aesthetic sense of “cute” and “cool” was stimulated.

As in the study by Kawakubo and Sasahara (2015), we assume that there was also a sense of specialness in receiving treatment from a skilled other person. From the interaction with the author, who was the practitioner, we believe that the children gained a sense of acceptance that their will was being accepted by being touched gently and carefully. Although physical contact with others they meet for the first time feels resistant, this occurred naturally during nail treatment. In relation to this, according to Kazuyuki Ikeyama of Vogue Japan, having someone take care of your hands maintains a good distance, which helps to relieve tension and relax.

Nail treatments allow children to enjoy colors and learn about fashion while enhancing their visual sensibility and sensitivity, which contributes to their physical and mental growth. It is also thought that it could be a place to convey correct fashion knowledge and play a role in supporting child-rearing. Further study is needed to determine how nail treatments contribute to children’s physical and mental growth.

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