



A Pilot Study Evaluating the Effectiveness of System-Wide Positive Behavior Support for Institutionalized Orphans in South Korea

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Objective In South Korea, the placement of orphans in institutions is still common, despite evidence of its adverse influence on children's psychological, emotional, physical, and cognitive development. In this preliminary study, we evaluate whether system-wide positive behavior support (SWPBS) is effective for decreasing externalizing problems in institutionalized children.

Methods SWPBS was provided for one month to 36 school-aged boys who had lived in an orphanage for an average of 8.72 years (SD=2.52), along with their 10 caregivers. Direct observation of the frequency of target behaviors in the participating children, caregivers' ratings of the severity of children's problematic behaviors, self-reported caregiving stress (i.e., Parenting Stress Scale), and intervention fidelity were dependent variables.

Results After receiving SWPBS, the frequency of problematic behaviors in the participating children showed a mean decrease of 73.6%. The caregivers also reported seeing a decrease in the severity of their children's problematic behaviors after SWPBS compared to before.

Conclusion SWPBS may be a promising intervention to decrease externalizing behaviors in school-aged children who have been living in institutions for a long time and have shown mental health issues.

Psychiatry Investig 2020;17(12):1236-1243

Key Words Externalizing behaviors, SWPBS, Intervention, Caregivers, Institutionalized orphans.

INTRODUCTION

In 2017, there were about 14,000 orphaned and abandoned children residing in institutions in South Korea.¹ Children reared in institutions suffer many disadvantages.² Accumulating evidence suggests that children raised in institutions are at risk for internalizing and externalizing problems, attention deficit hyperactivity disorder (ADHD), and autism.²⁻⁴ In fact, the incidence of externalizing problems is higher than that of internalizing problems among children living in Korean institutions.^{5,6} According to several studies conducted in South Korea, up to 50% of children living in institutions have untreated symptoms of emotional and behavioral problems.^{1,7} Studies conducted in other countries, such as Russia, Romania, and

African countries, where institutionalization of orphans is still common, have reported similar findings.^{2,8-10}

A key influencing factor of mental health risk among children raised in orphanages is caregiver-child psychosocial interaction.^{8,9} Smyke et al.¹⁰ found that after controlling for various child demographic characteristics (i.e., age, gender, ethnicity, and birth weight) and the duration of institutionalization, observed caregiving interactions (i.e., both qualitative and quantitative interactions) were associated with institutionalized children's cognitive development, competence, and negative behaviors. Previous research have also reported that when fewer caregivers consistently provided children with better social-emotional interactions, the children's physical, behavioral, and mental development substantially improved.^{11,12}

Unfortunately, certain aspects of the typical institutional environment may be detrimental to caregiver-child interaction, such as the highly regimented daily schedule, high child-to-caregiver ratio, uniform and impersonal caregiving, and frequent caregiver changes due to the use of a shift work schedule.⁹ These features can be ascribed to structural deficiencies and may result in caregivers' parenting stress and a neglectful caregiving.¹³ A previous study reported that the child-to-care-

Received: June 4, 2020 Revised: September 9, 2020

Accepted: October 15, 2020

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giver ratio in South Korea is quite inadequate to handle essential care, which can lead to high caregiving stress and reduce caregivers' quality of care, thus hindering children's psychological and social development.¹⁴ Many of the staff in these institutions also do not have adequate education and must cope with challenging, exceedingly stressful working conditions, which culminates in their ignoring children and failing to respond to children's needs and emotions, instead of providing nurturing and sensitive caregiving.¹⁴⁻¹⁶

Caregivers in orphanages also often use punitive discipline to address children's behavioral problems.¹⁶ Lee et al.¹⁷ found that around 40% of children raised in institutions reported being subjected to violence and physical punishment while residing there.

The coercion theory is a well-founded approach that explains how children's externalizing behaviors develop along with their noxious interactions, especially involving behavioral aspects, with caregivers who use punitive discipline.¹⁸ Punitive discipline may actually increase children's problematic behaviors rather than decreasing them through two behavioral mechanisms. First, children may learn to model the aggressive coping methods that caregivers use when punishing the children. Second, children tend to respond to punishment by increasing their aggressive responses (e.g., crying, whining, and tantrums) to avoid or beat the caregivers' aversive responses by the coercion process. This pattern of interactions may result in long term consequence of coercive interdependence between caregiver and children leading to the escalation of the children's externalizing behaviors.¹⁹⁻²¹ In addition, the association between neglectful caregiving, characterized by an absence of interaction, and externalizing problems has been well established. According to Knutson and colleagues, supervisory neglect has a mediating effect on predicting aggression in socioeconomically disadvantaged families.²⁰

These previous results suggest that interventions directly targeting positive behavioral interactions between caregivers and children might be effective in reducing externalizing problems in institutionalized children. This is because the negative behavioral aspects of child-caregiver interactions are an essential mechanism for the development of externalizing behaviors. Findings from related research on maltreatment support the efficacy of behavioral parenting training on improving caregivers' behaviors and interactions with their children to reduce the rate of behavioral problems in children.²¹

We considered system-wide positive behavior support (SWPBS) as one method of promoting a positive behavioral interaction for institutionalized children.²² Positive behavior support (PBS) is an intervention originally used in schools, now spreading to juvenile justice settings,²³⁻²⁵ and residential treatment facilities^{26,27} to deal with serious behavioral problems,

under the premise that children's behaviors are functionally related to their environment.²⁸ Grounded in behaviorism, PBS attempts to decrease problem behaviors and promote positive behaviors through changing the antecedents and consequences of problematic behaviors—namely, the environmental factors.²⁹ SWPBS is an expanded form of PBS that spans an entire system.

Previous research applying SWPBS to schools showed that it could increase positive interactions between students, teachers, and staff, as well as prompt a shift from punitive discipline to responsible and responsive discipline that is focused on positive reinforcement.^{30,31} In this way, SWPBS can be an effective means of changing the coercive processes that promote aggressive behaviors in children.³²

In addition, empirical research has demonstrated the efficacy of SWPBS outside of schools, including the management of young offenders' behavior in juvenile justice settings,²³⁻²⁵ boarding school students,³³ and young patients with severe emotional and behavioral disorders in residential treatment facilities.^{26,27} For example, a Korean study by Lee and Chung²⁶ reported that the implementation of a PBS intervention to address the behavioral problems of children with developmental disabilities in a rehabilitation ward significantly decreased the staff's punitive behavior and the children's externalizing behaviors.

The same study²⁶ found that providing PBS training to staff can have a positive effect on reducing their caregiving stress. Furthermore, a decrease in caregiving stress can lead to an increase in choosing an effective response to child aggression.³⁴ PBS might thus be an effective way to manage caregiving stress, which can lead to better disciplinary and response behaviors among caregivers.

Although SWPBS has been effective in many groups, researchers have yet to investigate its efficacy with institutionalized children with continuous psychological and emotional deprivation. The primary goal of the current study was to explore the feasibility of SWPBS in addressing the externalizing behaviors of school-aged children residing in institutions in South Korea. We hypothesized that applying SWPBS in institutions would decrease the institutionalized children's externalizing behaviors by positively changing the caregiver-child behavioral interactions. Moreover, we also assumed that providing SWPBS training to caregivers would reduce their caregiving stress.

The following specific interventions were implemented as part of the SWPBS in this study: 1) setting rules for appropriate behaviors as an alternative to problem behaviors; 2) teaching these rules to the children; and 3) engaging in contingency management consisting of the reinforcement of appropriate behaviors and the correction of inappropriate behaviors.

METHODS

Participants

Participants included 36 school-aged boys (8 boys didn't participate), 10 caregivers, and several staff members from an urban orphanage. At the time of data collection, the orphanage housed around 60 girls and boys. We selected caregivers and children from five of the boys' rooms, all of whom wished to participate in the study. The participating children's ages ranged from 5 to 13 years, with an average of 9.62 years ($SD=2.73$).

The orphanage consisted of several rooms in two buildings. A group of children shared a 30×49 m² room where they ate, slept, did their homework, and played. Each room was a residential unit that included bedrooms, a living room, and a bathroom, and housed both younger and older children, so the groups were heterogeneous in terms of age. Most children entered the orphanage as toddlers and had lived at the orphanage for between 4 and 13 years, with an average of 8.72 years ($SD=2.52$).

Two caregivers usually cared for seven to eight children in one room in 24-hour shifts (every other day). And staff members also provided laundry services and cooked meals. All 10 caregivers were female. Their average age was 29.9 years ($SD=3.93$), with a range of 25–37 years. Except for one caregiver, none were married, and all had social worker certificates. We gave all 10 caregivers about \$90 for their participation in the study.

Eighteen (50%) of the participating children were concomitantly receiving psychotropic medication for ADHD. Medical or neurodevelopmental problems other than ADHD are not specifically reported here.

The two girls' rooms were excluded because the caregivers reported that the girls did not require intervention, given that girls exhibited externalizing problems less frequently than did boys.

Measures

Problem levels in the pre-intervention phase

Before the intervention, we had caregivers administer a standardized instrument called the Korean Child Behavior Check-

list for Ages 6–18 (K-CBCL 6–18; 120 items) to objectively measure children's externalizing behaviors. The K-CBCL 6–18 was translated and validated by Oh and Kim³⁵ from the original by Achenbach and Rescorla.³⁶

We used the two broadband scales, which combine syndrome scales for internalizing and externalizing problems. Examples of items related to behavioral issues are "gets into fights" and "destroys others' things." The Cronbach's alpha coefficients for the scales ranged from 0.62 to 0.82 in the standardization study of the K-CBCL.

Behavioral problems

Behavioral problems were evaluated using both direct behavioral observation and caregiver report. We developed a list of externalizing behaviors based on previous PBS research.³⁰ After a discussion with the caregivers, we defined the target behaviors most frequently and specifically exhibited by the participating children. These target behaviors are listed in Table 1. Caregivers tallied the frequency of each behavior among the children using a counter during the pre- and post-intervention measurement phases. Specifically, the frequencies were counted during a period lasting 30 minutes at six random times over a week for each room during each measurement phase. The 30-minute observation time was chosen as the time when the frequency of externalizing behavior being reported high by caregivers, specifically during the 30 minutes before going to school starting after breakfast (7:00 am) and the 30 minutes after dinner (5:30 pm) when children were in their respective rooms and were playing freely.

Prior to data collection, we trained the caregivers to recognize the target behaviors and reliably count their frequencies. This training continued until they reached at least 80% interobserver agreement, which is an acceptable level in PBS literature. Interobserver agreement is computed by dividing the number of agreements by the total number of both agreements and disagreements, and then multiplying the result by 100, which yields the percentage (%). In the present study, a 10-minute video clip of the orphan's everyday lives was used for training. We could not calculate interobserver reliability during the actual study, as the director of the orphanage prohibited all guests

Table 1. Target behaviors that are the focus of system-wide positive behavior support

Target behaviors	Definition and examples of behavior
Noncompliance	Ignoring, arguing, talking back, disobeying adults when asked or ordered to do something
Physical aggression	Hitting, throwing objects at others, biting, scratching, throwing, knocking peers to ground, pushing
Verbal aggression	Arguing with peers, teasing, name calling, screaming, general inappropriate verbal remarks or gestures
Inappropriate physical contact	Touching peers unnecessarily, rough play, getting into skirmishes over objects
General disruption	Making noises, turning the body around, moving in a way that interrupts others' space
Emotional outbursts	Crying, violent bodily movement against the floor as a way of expressing anger

Table 2. Intervention fidelity items

items	Yes	No
1. Children were asked to read the rules out loud together		
2. All behaviors that complied with the rules were rewarded		
3. Wooden sticks (i.e., tokens collected for backup rewards) were distributed in a warm and kind manner		
4. The distribution of sticks was accompanied with specific verbal praise explaining which rule was followed well		
5. Children were retaught rule-compliant behaviors when they violated the rules		
6. The results were posted on the notice board twice per day		

from accessing the building outside of business hours and children were reluctant to be observed.

Caregivers were also asked to rate the level of the six target behaviors (Table 1) for each child using a 10-point Likert scale (0=not at all; 9=extremely strong). Our goal was to assess if the reduction in externalizing problems was identified not only through direct behavioral observations but also in the perceived ratings by the caregiver. Cronbach's alpha coefficient was 0.85 for pre-measurement and 0.86 for post-measurement.

Caregiving stress

We used the Parenting Stress Scale (PSS) by Kim and Kang³⁷ to assess the caregiving stress experienced by caregivers. This is a self-report scale containing 24 items, each rated on a scale from 1 (not at all) to 5 (very strong). Kang¹⁵ examined institutional caregivers' parenting stress after excluding one unrelated factor from the original scale's three factors and using only the remaining two factors ("typical stress due to parenting" and "pressures pertaining to the parental role and distress"), which were the same as those used in the present study (Supplementary Table 1 in the online-only Data Supplement). In Kang's¹⁵ study, the internal consistency of the two factors was 0.90. In this study, it was 0.93.

Intervention fidelity

For a valid and reliable intervention, the caregivers answered six items (with responses of "yes" or "no") that we developed to assess whether they had implemented the intervention properly or not (Table 2). We used their answers to calculate the intervention fidelity, as follows.

Intervention fidelity=(number of items answered "yes"/total number of items)×100

Procedure

The caregivers and staff of the orphanage agreed to participate in the study to address orphans' problems after learning the goal and procedure of the intervention. Subsequently, informed consent was obtained from them. This study was reviewed and approved by the Institutional Review Board of the first author's university (1041449-201612-HR-005). The main

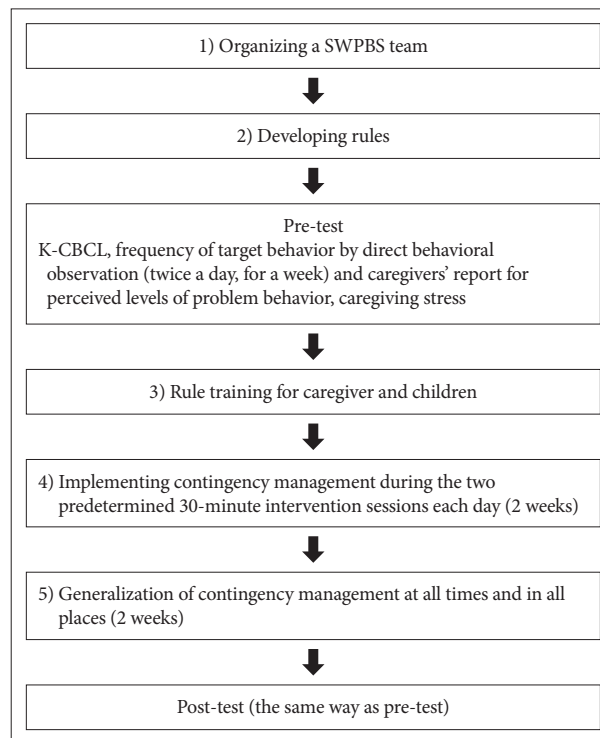


Figure 1. Procedure of SWPBS intervention. SWPBS: system-wide positive behavior support, K-CBCL: Korean Child Behavior Checklist.

elements of the SWPBS intervention were as follows (Figure 1). A detailed explanation of the process is provided in the Supplementary Materials (in the online-only Data Supplement).

1) The SWPBS team comprised staff, caregivers, and researchers. Team meetings were held once per week to address and solve problems encountered by the caregivers.

2) The SWPBS team developed a set of institution-wide five rules (Table 3) to reduce target behaviors. First, following a discussion, the team selected three core values (i.e., security, respect, and kindness) considered important in the orphanage. Second, based on these values, the caregivers and researchers defined five rules.

3) Subsequently, we implemented rule training for the children and caregivers in each of the five rooms, individually. The team created video clips with volunteer children to demon-

Table 3. Core values & rules

Safety	1. Keep hands and feet to self 2. Do not respond to bad behavior/comments
Respect	3. Ask other's permission
Kindness	4. Speak to each other in a kind way 5. Follow directions and say 'Yes' in 5 sec. when mom ordered or asked something.

strate the expected behaviors for each rule and the behaviors that violated the rules. During the rule training, the children and caregivers were instructed on rule compliance and violation behaviors using the video clips, and the children modeled the expected behaviors, practicing various examples.

4) A token contingency system was introduced to reinforce and improve the frequency of positive child-caregiver interactions (caregivers rarely initiated such interactions) and to increase rule compliance in the children. After completing the rule training, two predetermined 30-minute intervention sessions, for a total of one hour, were conducted simultaneously with the behavioral observations. During these sessions, the caregivers distributed wooden sticks as tokens for rule-compliant behaviors. The children who had earned a certain number of sticks could exchange the tokens for rewards (i.e., privileges and prizes).

5) After two weeks, the intervention was generalized across time and setting, so the caregivers distributed the tokens at all times and in all places, besides the two predetermined 30-minute sessions. The above procedure is shown in Figure 1.

RESULTS

K-CBCL 6–18 at pre-intervention phase

When the mental health status of the participants was investigated before the intervention, 28 out of the 36 (77.78%) children were found to have clinical levels of externalizing problems. Furthermore, five children (13.89%) had clinical levels of internalizing problems, and five children (13.89%) had clinical levels of both internalizing and externalizing problems. All the children with internalizing problems also had externalizing problems.

Behavioral problems

The mean frequency of problem behaviors ($M=4.32$) over the 30 minutes of direct observation in the post-intervention measurement represented a decrease of 73.66% compared to the pre-intervention measurement ($M=16.40$). Room C had rather few problems even before the intervention ($M=3.40$); hence, the frequency did not decrease further after the intervention ($M=4.40$). According to anecdotal reports from staff members, the caregivers responsible for Room C were already

Table 4. Pre-post difference in the mean frequency of observed target behaviors across 30 min

Room	Pre	Post	% change
A	38.40	6.40	-83.33%
B	12.40	6.40	-48.39%
C	3.40	4.40	+29.41%
D	13.00	2.00	-84.62%
E	14.80	2.40	-83.78%
Total frequency of problematic behaviors	16.40	4.32	-73.66%

responsive and friendly to children and consistent in terms of their interactions. When excluding the change rate of Room C, which was overestimated, the problem behaviors showed an improvement of 78.1% in the other four rooms. Three out of the five rooms showed a decrease in problem behaviors of over 80% (Table 4).

A t-test was conducted to examine the impact of the intervention on the levels of target behaviors as rated by caregivers across the two time periods. We observed a significant decrease in the severity of children's problem behaviors after implementing the intervention compared to before, total score: $t(35)=5.247$, $p<0.001$. The intervention effect was significant for all types of problems. Furthermore, the size of the intervention effect (Cohen's d) on the total score for problematic behaviors was 0.87, which indicates a large effect according to Cohen's³⁸ guidelines (Table 5).

Among the 36 children, 20 (55%) showed an improvement in the total score of post-intervention measurements that was greater than one standard deviation ($SD=8.30$).

Caregiving stress

The results of a t-test revealed that parenting stress did not significantly differ between the pre-and post-intervention measurements (pre-intervention: $M=64.20$, $SD=12.13$; post-intervention: $M=63.90$, $SD=17.72$; $t=0.10$, $p=0.92$).

Intervention fidelity

The intervention fidelity ranged from 73.32 to 100%, with an average of 89.6%, which is considered a reasonable level of fidelity in PBS literature.³⁹ This result shows that the caregivers faithfully implemented the intervention according to our instructions.

DISCUSSION

We examined whether SWPBS decreased externalizing behaviors in institutionalized children in South Korea. We hypothesized that SWPBS would increase positive behavioral interactions between caregivers and children, and ultimately

Table 5. Perceived levels of target behavior (N=36)

	Pre M (SD)	Post M (SD)	t	d
Noncompliance	4.39 (2.50)	2.64 (2.15)	5.25 [‡]	0.62
Physical aggression	3.56 (2.82)	1.97 (1.58)	3.30 [†]	0.55
Verbal aggression	4.67 (2.30)	3.14 (1.94)	3.70 [†]	0.62
Inappropriate physical contact	2.86 (2.18)	1.94 (1.67)	2.65 [*]	0.44
General disruption	3.56 (2.44)	1.81 (1.58)	5.65 [‡]	0.94
Emotional outbursts	4.19 (1.88)	2.19 (1.91)	4.60 [‡]	0.77
Total score for problematic behaviors	23.22 (11.55)	13.69 (8.30)	5.247 [‡]	0.87

* $p < 0.05$, [†] $p < 0.01$, [‡] $p < 0.001$. M: mean, SD: standard deviation, d: Cohen's d

decrease externalizing behaviors while increasing appropriate behaviors. We also expected PBS to have a positive effect on reducing caregivers' stress.

We found that SWPBS decreased the frequency of externalizing problematic behaviors, such as noncompliance, verbal aggression, physical aggression, general disruption, inappropriate physical contact, and emotional outbursts, in institutionalized school-aged children by around 74%. Furthermore, caregivers' evaluations of the children's problematic behaviors showed an improvement from pre- to post-intervention with a large effect size. These results indicate that SWPBS can also be implemented among institutionalized children in orphanages to effectively decrease behavioral problems as previous studies.^{25,26,31}

Of particular note is that the results were observed in a population characterized by frequent aggressive behavior. Indeed, the results of the K-CBCL 6–18 showed that approximately 80% of the children had externalizing problems above the clinical threshold before the intervention. In contrast, only around 40% of children in orphanages had externalizing problems in previous studies.²⁵ The fact that our participants had been living in the orphanage for an extended period might have contributed to the high occurrence of mental health problems. Previous research has confirmed that the critical length of exposure to such institutions ranges from 6 to 18 months in many countries, assuming that children were admitted within weeks or months after birth.⁹ After the critical length of exposure, they might begin to exhibit obvious deficiencies in physical, cognitive, and psychiatric development; however, the extent of the deficiency may be affected by the institutional environment.⁹ While for children from the fatally deficient orphanages, it can't be exceed 6 months, for children from some caregiving depriving institutions could be extended to 18 months. Since the participants of this study they had lived in the orphanage for 8.72 years on average, they were well past the critical age. However, the participating children's exact time of admission to the institution was not known, although it was confirmed that most of them were admitted as toddlers or infants. The findings of

this study show that SWPBS can be a promising alternative to individual therapy or usual services for reducing externalizing problems even in aggressive school-aged orphans residing in institutions for a long term.

The positive effect of the SWPBS intervention was evidently due to the improvement in child-caregiver behavioral interactions. This improvement was particularly related to positive changes in the detrimental coercive process, which involves aversive contingencies that can inadvertently trigger and maintain aggressive behaviors in children.²⁰ After we established clear and positive rules and consistently provided positive reinforcement through SWPBS, the children started to exhibit appropriate behaviors incompatible with problematic behaviors. During the intervention, the caregivers engaged in high frequencies of positive behavioral interactions (in the form of providing explicit rewards and social reinforcement) whenever the children behaved appropriately, which ultimately offset their coercive and neglectful caregiving behaviors. Similarly, previous studies have found that physical, cognitive, and social developmental delays in orphanage children can be reduced when caregivers are trained to increase the frequency of positive social-emotional interactions with such children.¹¹

The total parenting stress score for the caregivers did not change significantly even after the intervention. Unlike biological parents, caregivers in orphanages experience additional stress due to environmental factors, such as exceedingly poor working conditions. Since our intervention did not address the working conditions of the staff, it might have been less effective in changing caregivers' overall stress level.

The current study has various limitations. First, owing to the facility's limitations (a policy prohibiting guests from entering the orphanage outside of business hours), interobserver reliability of direct behavioral observations could not be calculated. We attempted to overcome this problem by providing data collection training to caregivers until they reached at least 80% interobserver agreement. Second, this study only applied SWPBS for a month, which is a relatively short amount of time to decrease problematic behaviors in institutionalized children

and evaluate the results. SWPBS is often applied for six months to several years.²² Therefore, future studies should implement SWPBS in institutions for longer periods to assess the long-term effects. At institutions, caregivers often change jobs, and children often move to other rooms. No caregiver moved or left the orphanage during this one-month-long study. However, caregivers and children would be expected to move during a longer intervention. Therefore, it is necessary to investigate whether SWPBS remains effective even when significant events, such as loss of attachment, occur frequently. Third, this study focused on ensuring that SWPBS had a positive effect on reducing the children's externalizing behaviors. Children's emotions or attachments, however, were not assessed. Future studies should therefore evaluate the qualitative aspects of child-caregiver interactions. Fourth, the participating caregivers might have been influenced by social desirability bias (or the Hawthorne effect). To circumvent this bias, we cross-referenced their self-report data on the levels of externalizing problems with direct behavioral observation data. These data were collected by counting the occurrence of observable target behaviors using a small manual counter kept in the caregivers' pockets; this method is less likely to result in biased over- or under-reporting. Fifth, the characteristic of the sample is also a limitation of this study. The sample size was relatively small due to that most institutions in South Korea are reluctant to have orphans examined or observed, as is true for orphanages in other countries.⁹ In addition, since we were intervening on a room-by-room basis, age of participating children were relatively heterogeneous, which have resulted in difficulty to explain the effect size of the result according to developmental ages.

Our findings suggest that SWPBS may be a promising intervention for children in orphanages with serious externalizing problems. If further research confirms that SWPBS is sustainable, it would be useful to consider introducing SWPBS in an effort to alleviate the mental health problems of institutionalized children in countries where institutional accommodation is relatively common.

Supplementary Materials

The online-only Data Supplement is available with this article at <https://doi.org/10.30773/pi.2020.0210>.

Acknowledgments

None.

Conflicts of Interest

The authors have no potential conflicts of interest to disclose.

Author Contributions

Conceptualization: Yunhee Kim. Data curation: Youngsun Park. Formal analysis: Yunhee Kim. Funding acquisition: Yunhee Kim. Investigation: Youngsun Park. Methodology: Yunhee Kim. Project Administration:

Youngsun Park. Resources: Youngsun Park. Software: Youngsun Park. Validation: Yunhee Kim. Visualization: Youngsun Park. Writing—original draft: Yunhee Kim. Writing—review & editing: Youngsun Park.

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Supplementary Table 1. Examples of items & Cronbach's alpha of Parenting Stress Scale

Subscales and examples of items	Cronbach's alpha	
F1. Typical stress due to the parenting	0.92	Total
It's physically hard for me to take care of my children.		0.94
It's hard for me to handle children when I'm out with them.		
F2. Pressures pertaining to the parental role and distress	0.89	
Sometimes I want to run away from my children.		
I'm distressed because I think it's my fault when my children show signs of emotional instability.		

SUPPLEMENT MATERIALS

PBS

A premise for PBS is that children's behaviors are functionally related to their environment. In other words, students' problematic behaviors are seen as the result of inappropriate learning in interaction with other people. PBS divides the environment surrounding problematic behaviors into A, B, and C: 1) problematic behaviors are classified as B, 2) antecedent, which comprises incidents and environments that caused the problematic behaviors, are classified as A, and 3) consequences that reinforce or extinct B are classified as C. Based on theories of behaviorism, PBS decreases children's problematic behaviors and promotes positive behaviors by changing A & C, which are environmental factors that maintain their problematic behaviors.¹ In SWPBS, PBS is applied to the entire system.

SWPBS involves 1) defining and teaching positive social expectations, 2) acknowledging appropriate behaviors, and 3) establishing consistent consequences for problem behaviors. The focus of SWPBS is on establishing a positive social climate in which behavioral expectations for students are highly predictable, directly taught, and consistently rewarded.²

In this study, the SWPBS intervention consisted of two phases: rule training and contingency management. Rule training corresponded to changing the antecedents of problem behaviors by defining and teaching expected/desirable behaviors incompatible with problem behaviors, while contingency management was equivalent to changing the consequences of behaviors by acknowledging and providing rewards for rule compliance. It was hypothesized that the intervention would first improve caregivers' positive interactions with children (in the form of attention, praise, and encouragement) and then decrease problem behaviors and increase desirable behaviors in children.

Procedure

SWPBS team meeting

PBS team meetings were held every week with caregivers, staff members, and researchers. Information covered in this meeting included 1) introduction of general PBS procedures, 2) discussion and determination of target behaviors, 3) introduction of and training for pre- and post-measurement methods, 4) rule education, 5) intervention training, and 6) problem solving. Since problems occurred frequently in the beginning while implementing intervention, researchers frequently provided consultation and support by phone or through SNS.

Developing rule

The team discussed and eventually adopted three core values (i.e., security, respect, and kindness) expected in the orphanage. From these values, the caregivers and researchers developed five rules: 1) keep one's hands and feet to oneself, 2) do not respond to bad behavior/comments, 3) ask for others' permission, 4) speak to each other kindly, and 5) follow directions and say "yes" within 5 seconds when ordered or asked by the caregiver to do something.

Rule training

We created video clips to demonstrate the expected behaviors for each rule and what behaviors constituted violations of the rules. Rule training consisted of the following steps: 1) teaching the rule; 2) providing specific examples of good and bad behaviors; 3) modeling the expected behaviors; and 4) having children practice the behaviors and then review their performance.

We also demonstrated the process of giving a token (i.e., a stick) for rule-compliant behaviors and a verbal correction for rule-violating behaviors, and encouraged caregivers to follow this process. Finally, a bulletin board with the rules listed as well as two counting boards were displayed in each room, allowing anyone to easily review the rules.

Contingency management

After completing the rule training, the caregivers monitored the children's behavior and gave tokens (in the form of sticks) to those who complied with the rules during two predetermined 30-minute intervention sessions each day. The caregivers were given 28 wooden sticks as a bundle and were instructed to use all 28 within the 30-minute period. This intervention was designed to encourage the caregivers to praise and reinforce children in high rates. At the beginning of the 30-minute session, the caregivers first asked children to read the rules together. While the children had free time, the caregivers observed their behaviors and distributed sticks with verbal praise when children displayed rule-compliant behavior. For any rule-violating behavior, the caregivers remind-

ed the child of the rules again and corrected his behavior verbally. At the end of each 30-minute intervention, the caregivers recorded the number of sticks earned by each child on the counting board.

Two kinds of rewards were provided—personal and group rewards. For personal rewards, the number of sticks earned by each child was counted twice a day. The child with the highest cumulative number of sticks from the first count to the second count was selected as the day's MVP (Most Valuable Player), and his name was recorded on the MVP bulletin board. The MVP could then choose a reward from the "reward menu," which contained items not exceeding \$1 (e.g., snacks, beverages, cup noodles, stationery, allowance, and small toys). The cumulative number of sticks earned by all the children in each room was marked on the group counting board that was in the shape of a thermometer. When the scale of the thermometer reached the target value (i.e., 700 degrees), the children were given a group reward—a party in which they ate ramen or fried chicken together.

After two weeks, the intervention was generalized across time and setting, and was implemented at all times and in all places throughout the institution. In other words, the children received the tokens at anytime and anywhere in the orphanage whenever they complied with the expected behaviors. Each stick in the bundle provided to each caregiver had her name on it, which enabled us to count the number of tokens distributed by each caregiver. Based on this, the caregiver who distributed the most tokens received a reward. Thus, the caregivers' positive interactions (i.e., paying positive attention to children and rewarding their desirable behaviors) were reinforced.

Data collection

Data collection was done by direct behavioral observation and caregiver report. Children were reluctant about being videotaped or observed by outside observers. When outside observers tried to videotape or observe the children, they tended to actually leave the room to avoid being observed (i.e., the Hawthorne effect). Some children showed indiscriminate friendliness to strangers and refused to leave them. Thus, the decision was made that the caregivers count the target behaviors with a small manual counter in their pocket that is invisible from the outside.

Caregivers tallied the frequency of each behavior among the children using a counter during the pre- and post-intervention measurement phases. Specifically, the frequencies were counted during a period lasting 30 minutes at six random times over a week for each room during each measurement phase. The 30-minute observation time was chosen based on the time when the caregivers reported high frequencies of problematic behaviors, specifically during the 30 minutes before going to school starting after breakfast (7:00 am) and the 30 minutes after dinner (5:30 pm) when children were in their respective rooms and were playing freely.

Data analysis

The mean of direct observation data was calculated by dividing the number of target behavior occurrences across 30 minutes by the total number of observations. Subsequently, the pre-post intervention difference in the mean frequency of observed target behaviors was obtained as a percentage.

Next, differences in pre- and post-scores for the level of problem behaviors perceived by caregivers were analyzed. First, the mean and standard deviation were calculated using SPSS v.22, and then, a corresponding sample t-test was performed to determine if there were significant differences between the pre- and post-scores.

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