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Original Article

Impact of Reimbursement Expansion on Clinical Environment and Caregiver Satisfaction in Dental Care for Pediatric and Adolescent Patients with Disabilities: A Pilot Study at Yonsei University Dental Hospital

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Abstract

This study aimed to investigate caregivers' treatment satisfaction and clinical changes after the expansion of the additional reimbursement system for dental treatment for children with disabilities. A cross-sectional survey was conducted from April to May 2025 among 106 caregivers of pediatric patients with registered disabilities, including intellectual disability, brain lesion-related disabilities, and autism spectrum disorder. The 30-item questionnaire covered demographics, dental history, system awareness, clinical changes, and satisfaction. Statistical analyses included the Wilcoxon signed-rank test, Fisher-Freeman-Halton exact test with Monte Carlo estimation, the binomial test, and the Poisson rate test, with the significance level set at $\alpha = 0.05$. After expansion, the most common dental visit interval shifted from every 6 months to every 3 – 4 months ($p < 0.0001$). Caregivers reported improvements in treatment proactivity ($p = 0.002$) and treatment diversity ($p < 0.0001$), as well as overall satisfaction with dental care ($p < 0.0001$). This study suggests improvements in the clinical environment and satisfaction following the policy expansion. In the future, large-scale and long-term studies may help enhance the reliability of the findings and clarify their broader clinical implications. [J Korean Acad Pediatr Dent 2026;53(1):97-113]

Keywords

Children with special health care needs, Additional reimbursement system, Treatment satisfaction, Pediatric dentistry

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Introduction

In South Korea, the registered population of children and adolescents with disabilities increased from about 89,000 in 2015 to approximately 100,000 in 2024[1],

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reflecting refined diagnostic criteria and expanded welfare programs. Previous reports show that patients with disabilities experience higher rates of dental caries than those without disabilities along with greater unmet healthcare needs[2,3]. According to the 2021 report on unmet healthcare needs among people with disabilities in Korea, the unmet healthcare rate among persons with disabilities in 2014 was 22.4%, about 10% higher than that of non-disabled individuals[4]. Similarly, the 2023 Survey on Persons with Disabilities reported a median unmet healthcare rate of 17.3%, compared to 5.3% in the general population[5].

According to a previous survey of dentists in Korea, only 1.4% of dentists reported providing dental care for patients with disabilities, and many had discontinued treatment. Reported barriers included poor patient cooperation and inadequate reimbursement[6,7]. These findings indicate that although individuals with disabilities require more treatment, they face greater barriers to healthcare access, reflecting structural disparities in healthcare equity.

To address these limitations, the National Health Insurance Service implemented an additional reimbursement system for dental care provided to registered patients with disabilities. Under this system, when treatment is delivered to patients with disabilities—who generally present greater clinical challenges—an additional fee is added to the insurance reimbursement score. The scheme compensates dental professionals for extra resources, including specialized equipment, extended treatment time, and additional personnel. Ultimately, this policy serves as an institutional measure to improve access to dental care for patients with disabilities.

South Korea introduced the additional reimbursement system for dental treatment of registered patients with disabilities in October 2012, initially covering 15 treatment items reimbursed at 100% of the prescribed score. The scheme included four categories: (1) additional fees for basic consultations, (2) dental procedures and surgeries, (3) dental safety observation, and (4) fluoride application for caries prevention, with extra percentages applied to selected procedures for patients with brain lesions, intellectual disability, mental disorders, or autism spectrum disorder. In March 2024, the policy expanded to 71 treatment items, and reimbursement was increased to three times the original level[8,9].

The expansion of this scheme may alleviate difficulties in clinical practice and improve access to oral healthcare for children with disabilities. However, little is known about how it is perceived by children with disabilities and their caregivers. Therefore, this study aimed to evaluate changes in the clinical environment and caregiver satisfaction with dental treatment among patients with disabilities who visited Yonsei University Dental Hospital following the expansion of the system.

Materials and Methods

1. Study population

This study was conducted between April and May 2025 and targeted caregivers of pediatric and adolescent patients with registered disabilities who visited the Yonsei University Dental Hospital. Eligible children had intellectual disability, brain lesion-related disabilities, mental disorders, or autism spectrum disorder, conditions covered under the additional reimbursement system for dental treatment.

A total of 106 caregivers completed the questionnaire on awareness and satisfaction with the system. The study was approved by the Institutional Review Board of Yonsei University Dental Hospital (Approval No. 2-2025-0010). Informed consent was obtained from all participants, who were the parents as the legal guardians of the pediatric patients. Caregivers were allowed to withdraw from participation at any time, and the survey was immediately discontinued upon withdrawal. All collected data were recorded using unique identification numbers, ensuring that caregivers could not be personally identified.

2. Methods

1) Questionnaire design

The questionnaire items were developed with reference to previous studies related to dental care satisfac-

tion and were designed by four dentists, including two pediatric dentistry specialists, an advanced general dentistry specialist, and a general dentist, based on their clinical experience. The questionnaire items were phrased to be easily understood by caregivers.

2) Survey procedure

Caregivers were informed about the survey by hospital staff. After giving written consent, caregivers completed a 30-item questionnaire divided into three sections.

The first section collected demographic and background data, including the sex and age of patients and caregivers, the type of registered disability on the welfare card, and the type of dental institution currently visited (Fig. 1). The second section addressed prior dental visits, such as treatments commonly received, experiences of unmet dental care needs, and visit frequency before expansion of the system (Fig. 2). The third section evaluated caregivers' awareness of the system and compared satisfaction with dental treatment before and after expansion. It also asked about perceived changes in the clinical environment, including treatment proactivity, treatment diversity, and ease of making appointments (Fig. 3).

Survey on the Additional Reimbursement System for Dental Treatment for Registered Patients with Disabilities

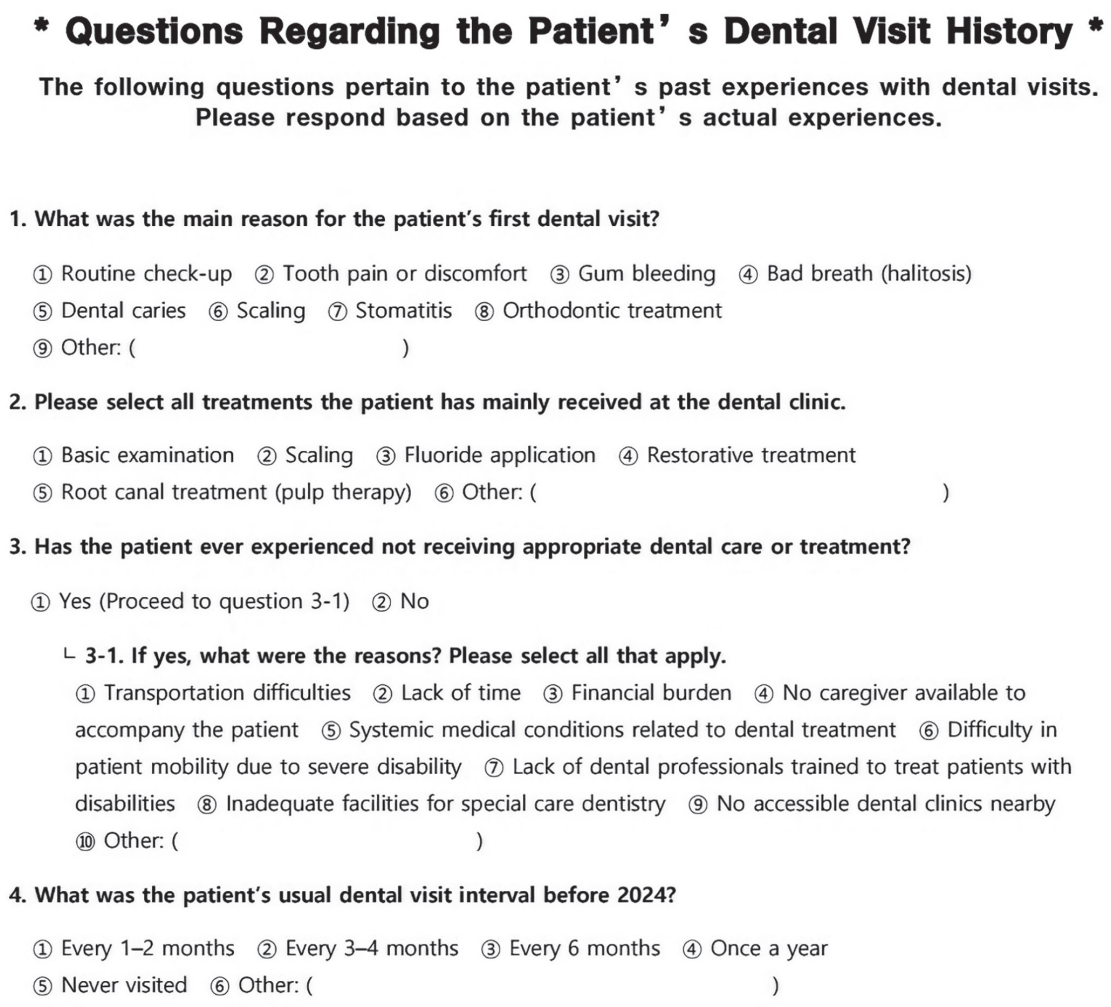
(For Caregivers)

The Department of Pediatric Dentistry at Yonsei University Dental Hospital is conducting a survey on caregivers' awareness and satisfaction regarding the Additional Reimbursement System for Dental Treatment for registered patients with disabilities. The purpose of this survey is to collect baseline data to support future improvements to the system.
The survey will take approximately 10 minutes to complete.
We sincerely appreciate your participation.

*** Basic Questions ***

Patient's Gender	① Male ② Female
Patient's Age	① 0–9 years ② 10–19 years ③ 20–29 years ④ 30–39 years ⑤ 40–49 years ⑥ 50 years or older
Type of Registered Disability	① Intellectual disability ② Brain lesion–related disabilities ③ Autism spectrum disorder ④ Mental illness ⑤ Other
Current Dental Care Facility (multiple selections allowed)	① University dental hospital ② Public healthcare institution ③ Private dental clinic ④ Other: (_____)
Your (Caregiver's) Gender	① Male ② Female
Your (Caregiver's) Age	① 20–24 years ② 25–29 years ③ 30–34 years ④ 35–39 years ⑤ 40–44 years ⑥ 45 years or older
Your (Caregiver's) Place of Residence	_____ (e.g., Goyang-si, Gyeonggi-do)

Fig. 1. Survey showing the demographics of patients and caregivers, including registered disability types and the types of dental institutions visited.



*** Questions Regarding the Patient's Dental Visit History ***

The following questions pertain to the patient's past experiences with dental visits. Please respond based on the patient's actual experiences.

1. What was the main reason for the patient's first dental visit?

① Routine check-up ② Tooth pain or discomfort ③ Gum bleeding ④ Bad breath (halitosis)
⑤ Dental caries ⑥ Scaling ⑦ Stomatitis ⑧ Orthodontic treatment
⑨ Other: ( )

2. Please select all treatments the patient has mainly received at the dental clinic.

① Basic examination ② Scaling ③ Fluoride application ④ Restorative treatment
⑤ Root canal treatment (pulp therapy) ⑥ Other: ( )

3. Has the patient ever experienced not receiving appropriate dental care or treatment?

① Yes (Proceed to question 3-1) ② No

└ 3-1. If yes, what were the reasons? Please select all that apply.
① Transportation difficulties ② Lack of time ③ Financial burden ④ No caregiver available to accompany the patient ⑤ Systemic medical conditions related to dental treatment ⑥ Difficulty in patient mobility due to severe disability ⑦ Lack of dental professionals trained to treat patients with disabilities ⑧ Inadequate facilities for special care dentistry ⑨ No accessible dental clinics nearby
⑩ Other: ( )

4. What was the patient's usual dental visit interval before 2024?

① Every 1–2 months ② Every 3–4 months ③ Every 6 months ④ Once a year
⑤ Never visited ⑥ Other: ( )

Fig. 2. Survey on the dental visit history of patients, including frequency and reasons for dental visits.

3) Medical records analysis

Using patients' electronic medical records, changes in the number of dental procedures before and after the expansion were analyzed. The number of treatments performed during equivalent time periods before and after the policy expansion was examined for each patient, and the procedures were categorized as insurance-covered scaling, fluoride application, sealant, and glass ionomer (GI) restoration.

3. Statistical analysis

Statistical analyses were performed using IBM SPSS Statistics version 31.0 (IBM Corp., Armonk, NY, USA). The Fisher-Freeman-Halton exact test with Monte Carlo estimation and the Wilcoxon signed-rank test were used to analyze changes in dental visit frequency. The binomial test was used to compare satisfaction and clinical environment before and after expansion. The Poisson rate test was performed using Microsoft Excel to analyze changes in the number of dental treatment procedures. Statistical significance was set at $\alpha = 0.05$.

* Questions on Awareness and Satisfaction with the Additional Reimbursement System for Dental Treatment in Registered Patients with Disabilities *

The following questions pertain to your (the caregiver's) awareness of and satisfaction with the Additional Reimbursement System for Dental Treatment for registered patients with disabilities.

1. Are you aware of the dental treatment benefits available to registered patients with disabilities who present a disability welfare card?

① Yes (Proceed to Questions 1-1, 1-2, and 1-3) ② No

└ **1-1. When did you become aware of these benefits?**
① Before April 2024 ② After April 2024

└ **1-2. Through which channel did you learn about the benefits?**
① Through dental care staff ② Through media (Internet, TV, radio, etc.) ③ From acquaintances
④ Other: ( )

└ **1-3. How many fluoride applications per year do you believe are covered under the program?**
① No limit ② Once per year ③ Twice per year

2. When did you register the disability welfare card at the dental clinic (administrative office)?

① Before April 2024
② After April 2024
③ I'm not sure

3. Through which channel did you register the disability welfare card at the dental clinic (administrative office)?

① Upon recommendation from clinic staff
② Through information from media sources
③ Upon recommendation from an acquaintance
④ Other: ( )

4. Have you received any benefits during dental visits as a result of registering the welfare card?

① Yes ② No (Proceed to Question 4-1)

└ **4-1. If no, what were the reasons? (Select all that apply)**
① The benefits are not clearly felt
② Long waiting times
③ Decline in quality of care
④ Difficulty in booking appointments
⑤ Other: ( )

Fig. 3. Survey on caregivers' awareness of the additional reimbursement system and satisfaction with dental treatment before and after the system expansion.

5. What has been the patient's recent dental visit interval (since the summer of 2024)?

① Every 1–2 months ② Every 3–4 months ③ Every 6 months ④ Once a year
⑤ This is the first visit ⑥ Other: ( )

6. Since the summer of 2024, do you feel the patient is receiving better dental care?

① Yes ② No (About the same)

7. Since the summer of 2024, has the patient received a wider range of treatments than before?

① Yes ② No (About the same)

8. Since the summer of 2024, has it become easier to make dental appointments?

① Yes ② No (About the same)

9. Since the summer of 2024, have dental clinic staff been more courteous?

① Yes ② No (About the same)

10. Since the summer of 2024, do you feel that staff are providing more professional care?

① Yes ② No (About the same)

11. Compared to before 2024, has your overall satisfaction with dental care increased recently?

① Yes ② No (Proceed to Question 11-1) ③ The patient had not visited the dentist before 2024

└ 11-1. If no, what are the reasons for the lack of improvement in satisfaction?
① Long waiting times
② Tendency toward overtreatment
③ Decline in quality of care
④ Other: ( )

12. Do you think this benefit program for patients with disabilities will be helpful in improving access to dental care for people with disabilities in the future?

① Yes ② No

13. Please feel free to share any suggestions for improving dental care, or note any recent changes you have observed in comparison to the previous year.

*** We sincerely appreciate your participation in this survey ***

Fig. 3. (Continued) Survey on caregivers' awareness of the additional reimbursement system and satisfaction with dental treatment before and after the system expansion.

Results

1. Feasibility of the survey tool

Of the 107 caregivers invited to participate, 106 completed all survey items, showing a high overall response rate. The mean time required for completion was less than 10 minutes, and no participant reported difficulties understanding the items. Non-responses were observed only in the open-ended item asking caregivers to freely suggest improvements. The response rate for this item was approximately 18.9%, indicating a relatively low response rate.

2. Survey on basic information and dental history of patients and caregivers

Baseline characteristics were obtained from participants who visited the Pediatric Dentistry Department at Yonsei University. Among 106 pediatric and adolescent patients with registered disabilities, male patients were more prevalent (61.3%), most caregivers were female (82.1%), and the largest group was aged 45 years or older (50.0%). By disability type, brain lesion-related disabilities were most frequent (46.6%), followed by intellectual disability (42.7%) and autism spectrum disorder (9.9%).

The most common reason for the first dental visit was a routine check-up (49.0%), followed by dental caries (28.7%) and tooth pain or discomfort (7.7%). Main treatments included basic examination (27.9%), fluoride application (27.6%), and restorative treatment (15.6%). Among 106 patients, 41.5% reported unmet dental care needs. The leading cause was a shortage of dental professionals trained in disability care (37.1%), followed by inadequate special-care facilities (15.7%), absence of nearby accessible dental clinics (13.5%), and mobility difficulties due to severe disability (11.2%). These findings demonstrate persistent barriers to dental care access for children with disabilities (Table 1).

3. Survey on caregivers' awareness of the additional reimbursement system for dental treatment

Of 106 patients, 62 caregivers (58.5%) were aware of the system, while 44 (41.5%) were not. Among those aware, only 13 caregivers (21.0%) correctly recognized fluoride application as a covered benefit. The most common source of awareness regarding the system was dental care staff (Table 2).

4. Survey on clinical changes following the expansion of the additional reimbursement system for dental treatment

1) Changes in the frequency of dental visits before and after the expansion of the additional reimbursement system

Among 106 pediatric patients, pre-expansion analysis showed the most common visit interval was every 6 months (n = 53, 50.0%), followed by every 3 – 4 months (n = 33, 31.1%) and every 12 months (n = 16, 15.1%). After expansion, the most common interval shifted to every 3 – 4 months (n = 58, 54.7%), followed by every 6 months (n = 39, 36.8%). This difference in intervals was statistically significant according to the Fisher-Freeman-Halton exact test with Monte Carlo estimation ($p < 0.0001$, Fig. 4).

Dental visit interval changes were analyzed for 106 patients, of whom 49 demonstrated measurable shifts. Overall, visits became more frequent, which was statistically significant according to the Wilcoxon signed-rank test ($p < 0.0001$). The most common change was a reduction from 6 months to 3 – 4 months (n = 25), followed by 12 months to 6 months (n = 7, Fig. 5).

2) Changes in the clinical environment before and after the expansion of the additional reimbursement system for dental treatment

The number of dental procedures covered by insurance performed during equivalent time periods was higher after the expansion. Scaling showed the highest rate of increase after the policy expansion, rising by 211.1% compared with before the expansion, followed by fluoride application, which increased by 151.2%. The number of scaling, fluoride application, and GI restoration procedures significantly increased according to the Poisson rate test. Preventive procedures therefore increased at a relatively high rate overall (Fig. 6).

Caregivers reported significant increases in treatment

Table 1. Demographic characteristics of patients and caregivers

	Characteristics		n (106)	%
Patients	Sex	Male	65	61.3
		Female	41	38.7
	Age	0 – 9	32	30.2
		10 – 19	74	69.8
	Type of Registered Disability*	Brain lesion-related disabilities	61	46.6
		Intellectual disability	56	42.7
		Autism spectrum disorder	13	9.9
		Other	1	0.8
	Current Dental Care Facility*	Dental university hospital	106	93.0
		Private dental clinic	7	6.1
		Public healthcare institution	1	0.9
	Main reason for the first dental visit*	Routine check-up	70	49.0
		Dental caries	41	28.7
		Tooth pain or discomfort	11	7.7
		Orthodontic treatment	6	4.2
		Scaling	3	2.1
		Gum bleeding	2	1.4
		Bad breath (halitosis)	1	0.7
		Other	9	6.3
	Main dental treatment*	Basic examination	88	27.9
		Fluoride application	87	27.6
		Restorative treatment	49	15.6
		Scaling	49	15.6
		Root canal treatment (pulp therapy)	33	10.5
		Other	9	2.9
	Experience not receiving appropriate dental treatment	Yes	44	41.5
		No	62	58.5
	Reason for not receiving dental treatment*	Lack of dental professionals trained to treat patients with disabilities	33	37.1
		Inadequate facilities for special care	14	15.7
		No accessible dental clinics nearby	12	13.5
		Difficulty in patient mobility due to severe disability	10	11.2
		Transportation difficulties	5	5.6
		Financial burden	5	5.6
		No caregiver available to accompany the patient	4	4.5
		Lack of time	3	3.4
		Systemic medical conditions related to dental treatment	3	3.4
Caregivers	Sex	Male	19	17.9
		Female	87	82.1
	Age	30 – 34	1	0.9
		35 – 39	9	8.5
		40 – 44	43	40.6
		≥ 45	53	50.0

* Multiple answers allowed.

Table 2. Parental awareness of the additional reimbursement system for dental treatment

Awareness of the system	Total (n = 106)	Subcategory (if Aware)		n (%)
Aware	62 (58.5%)	Correctness of awareness of the system	Correct	13 (21.0%)
			Incorrect	49 (79.0%)
		Source of awareness of the system	Through dental care staff	44 (71.0%)
			Through media	4 (6.5%)
			From acquaintances	14 (22.6%)
Not aware	44 (41.5%)			

Values are presented as number (%).

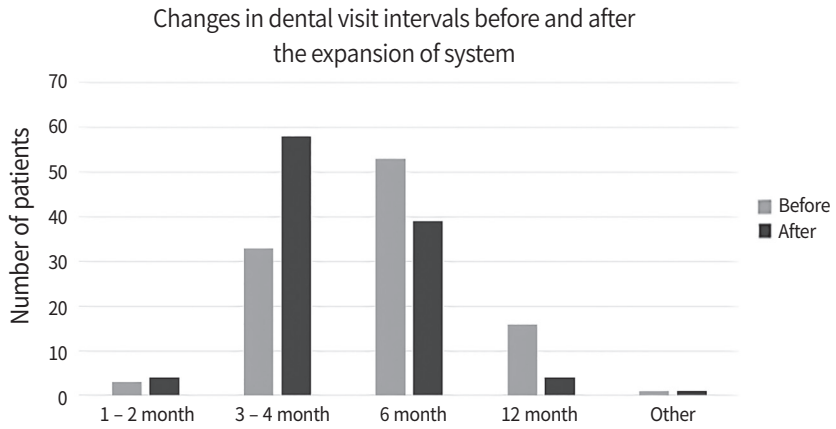


Fig. 4. Changes in dental visit intervals before and after the expansion of the Additional Reimbursement System for Dental Treatment. The difference in intervals was statistically significant according to the Fisher-Freeman-Halton exact test with Monte Carlo estimation ($p < 0.0001$).

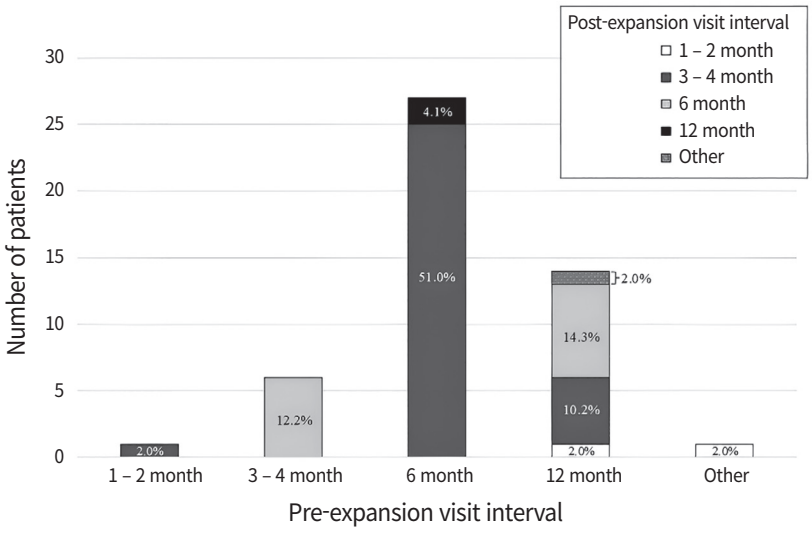


Fig. 5. Changes in dental visit interval trends among 49 patients before and after the expansion of the Additional Reimbursement System for Dental Treatment.
The shift in dental visit intervals showed a statistically significant tendency toward shorter intervals according to the Wilcoxon signed-rank test ($p < 0.0001$).

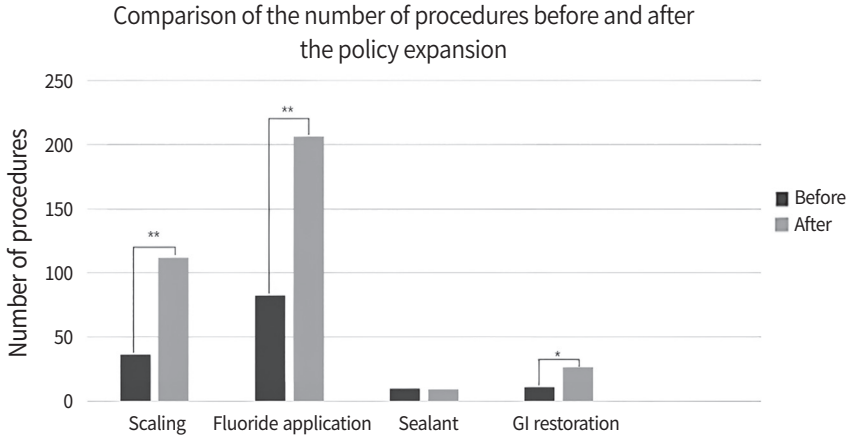


Fig. 6. Comparison of the number of procedures before and after the policy expansion.
Scaling and fluoride application increased significantly ($p < 0.0001$), and GI restoration also showed a significant increase ($p = 0.014$) according to the Poisson rate test.
* and ** indicate $p < 0.05$ and $p < 0.0001$, respectively.

proactivity ($p = 0.002$) and treatment diversity ($p < 0.0001$) after the system's expansion. Caregivers also gave relatively positive responses regarding the professionalism of treatment. Although positive responses were fewer in the ease of making appointments and staff courtesy, these differences were not statistically significant (Table 3).

5. Survey on caregivers' satisfaction with the additional reimbursement system for dental treatment

1) Survey on caregivers' satisfaction with dental care before and after the expansion of the additional reimbursement system

Among 106 caregivers, overall satisfaction with dental care significantly increased afterward ($p < 0.0001$). Of the 22 caregivers who reported no improvement in satisfaction, the most common reason was longer waiting times (59.1%, Table 4).

2) Survey on perceived benefits of the additional reimbursement system for dental treatment

Of 106 caregivers, 70 (66.0%) reported experiencing benefits, a statistically significant result ($p = 0.001$). Among 36 caregivers who reported not perceiving benefits, nearly all (97.2%) cited the absence of items through which benefits could be directly felt (Table 5).

Table 3. Comparison of clinical environment before and after the expansion of the additional reimbursement system

	Yes	No (about the same)	p-value[§]	95% CI
More proactive dental treatment	69 (65.1%)	37 (34.9%)	0.002*	56.0 – 74.2%
Greater variety of treatments received	71 (67.0%)	35 (33.0%)	$p < 0.0001$*	58.0 – 75.9%
Easier to make dental appointments	47 (44.3%)	59 (55.7%)	0.285	34.9 – 53.8%
Improved courtesy of dental clinic staff	51 (48.1%)	55 (51.9%)	0.771	38.6 – 57.6%
Treatment provided more professionally	61 (57.5%)	45 (42.5%)	0.145	48.1 – 67.0%

Values are presented as number (%).
95% confidence intervals were calculated using the normal approximation ($p \pm 1.96 \times SE$).
[§]: The binomial test.
*: Statistical significance ($p < 0.05$).

Table 4. Comparison of overall dental care satisfaction before and after the expansion of the additional reimbursement system

Improved satisfaction	Total (n = 106)	*p*-value[§]	95% CI	Subcategory (if No)	n (%)
Yes	84 (79.2%)				
No	22 (20.8%)	$p < 0.0001$*	71.5 – 87.0%	Longer waiting time	13 (59.1%)
				No difference before and after expansion of the additional reimbursement system	9 (40.9%)

Values are presented as number (%).
95% confidence intervals were calculated using the normal approximation ($p \pm 1.96 \times SE$).
[§]: The binomial test.
*: Statistical significance ($p < 0.05$).

Table 5. Survey on perceived benefits of the current additional reimbursement system for dental treatment

Perceived benefit	Total (n = 106)	*p*-value[§]	95% CI	Subcategory (if No)	n (%)
Yes	70 (66.0%)				
No	36 (34.0%)	0.001*	57.1 – 74.9%	No direct benefits perceived	35 (97.2%)
				Long waiting time	1 (2.8%)

Values are presented as number (%).
95% confidence intervals were calculated using the normal approximation ($p \pm 1.96 \times SE$).
[§]: The binomial test.
*: Statistical significance ($p < 0.05$).

3) Caregivers' suggested improvements to the additional reimbursement system for dental treatment

In response to the open-ended question, 20 caregivers suggested improvements to the additional reimbursement system for dental treatment. The most frequent request was to increase the number of dental care institutions equipped to treat patients with disabilities, followed by expanding financial benefits for dental care of children with disabilities and extending available treatment schedules. Other suggestions included training more dental professionals in special care and strengthening institutional systems for managing dental treatment of patients with disabilities (Fig. 7).

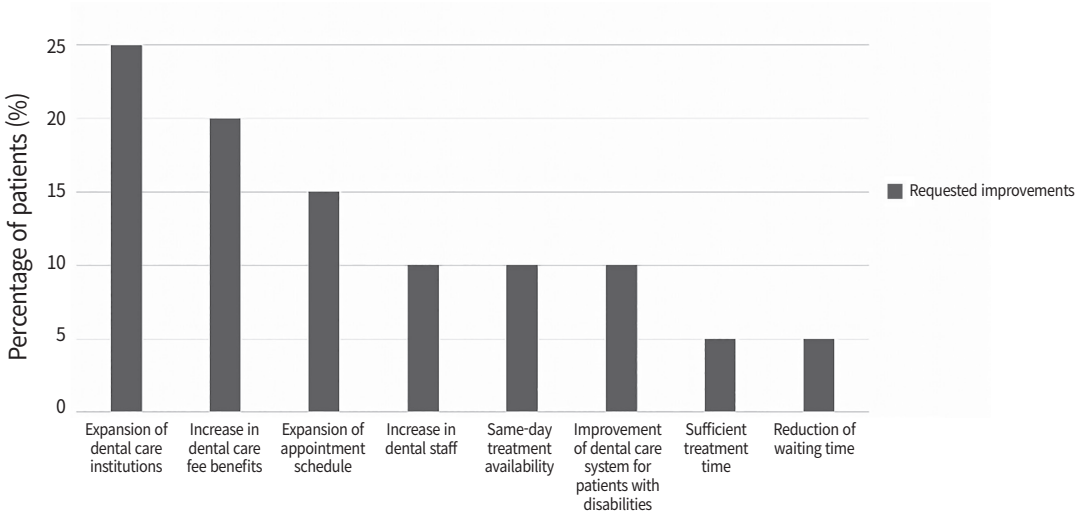


Fig. 7. Caregivers' suggested improvements for dental care of patients with disabilities.

Discussion

This study was conducted to investigate changes in treatment satisfaction and the clinical environment after the policy expansion. The results of this study show that after the policy expansion, patients' dental visit intervals became shorter. Treatment proactivity, treatment diversity, and dental care satisfaction also improved, indicating positive shifts in dental care utilization among children with disabilities visiting our hospital.

Regarding the dental history of patients who visited our hospital, brain lesion-related disabilities were the most common, followed by intellectual disability and autism spectrum disorder, with no cases of mental disorders. By contrast, according to 2024 national statistics, the order was different, with intellectual disability being the most common, followed by autism spectrum disorder and brain lesion-related disabilities[10]. All caregivers in this study were parents, which is consistent with the trend reported in the 2023 Survey on the Status of Persons with Disabilities, identifying parents as the primary caregivers for most children with disabilities[5].

In this study, caregivers of patients who experienced unmet dental care needs most commonly reported a shortage of dental professionals trained to treat patients with disabilities as the primary barrier to receiving dental care. Other studies have similarly reported that the shortage of workforce remains a major barrier to dental care access for individuals with disabilities[11,12].

Research by Krishnan et al.[13] and Casamassimo[14] has also reported the tendency of dental professionals to avoid treating children with disabilities, emphasizing the shortage of trained personnel as a critical barrier. The background to this shortage has been reported to include the avoidance of providing care due to concerns about systemic medical conditions of children with disabilities, challenges associated with uncooperative behavior, and additional time demands[15-19]. This suggests that although conditions for dental treatment for individuals with disabilities have improved, the lack of dentists able to provide appropriate treatment remains a critical problem.

In this study, patients whose dental visits had previously occurred at intervals of every 6 or 12 months shifted to shorter intervals after the system expansion. This change may be related to the increased availability of treatment schedules for patients with disabilities at our hospital. After the policy expansion, the number of treatment schedules for patients with disabilities increased by 2.5 times per week compared with before the expansion, which may suggest improved opportunities for dental care access. Consequently, although the increased total number of patients did not lead to greater ease in scheduling appointments, the range of available treatment schedules may be interpreted as having become more diverse than before the expansion.

Regular dental visits are critical for early detection and prevention of oral disease, and this is particularly important for patients with disabilities, who are more vulnerable to oral diseases than the general population[20,21]. Previous studies have reported that dental visit intervals shorter than 12 months are more beneficial for oral health[22-25]. In addition, the American Academy of Pediatric Dentistry (AAPD) guidelines state that children with disabilities are more likely to be classified within the moderate-risk to high-risk range for dental caries development, and regular checkups every 6 or 3 months are recommended[26]. In this study, the largest proportion of patients who showed changes in their dental visit intervals were those whose recall interval was shortened from 6 months to 3 – 4 months. All 25 of these patients had inadequate oral hygiene maintenance. They also tended to be categorized as high-risk according to the AAPD guidelines due to factors such as visible plaque on teeth, incipient dental caries or white spot lesions, visible caries lesions, recent restorations due to caries, and new cavitated caries lesions or lesions into dentin radiographically. Conversely, among 6 patients who practiced oral hygiene at least twice daily and had no active carious lesions, the recall interval was extended from 3 – 4 months to 6 months.

In this study, an increase in the number of dental procedures performed during the same period after the policy expansion was observed compared with before

the expansion, with preventive procedures such as scaling and fluoride application showing a greater rate of increase. Scaling was performed for 35 more patients and fluoride applications for 34 more patients compared with before the policy expansion. In all of these patients, generalized dental plaque deposits and localized dental calculus deposits were observed, suggesting that they required preventive procedures. In addition, all patients had fluoride application intervals longer than three months. According to the AAPD guidelines, fluoride application has been reported to be effective in reducing the prevalence of dental caries in children with disabilities, and applications at 3- or 6-month intervals are recommended[26,27].

Therefore, after the policy expansion, the increased availability of treatment schedules may have allowed patients who required more frequent management to receive regular checkups more often and those in need of preventive procedures to receive more proactive management. Overall, the shortened dental visit intervals and the increased frequency of preventive treatments may indicate positive implications for the oral health management of children with disabilities in our hospital.

Analysis of caregiver responses on the clinical environment suggests that treatment proactivity and diversity improved, which may be supported by the increase in insurance-covered procedures and the number of patients receiving preventive treatments. These findings suggest improvements in the clinical environment, which in turn may have contributed to the improvement in overall dental care satisfaction. However, the causal relationship is not clear, and the questionnaire was broad in scope, which may have introduced some ambiguity in interpreting the results. Therefore, future studies may consider distinguishing specific aspects such as accessibility, cost, and quality of care when evaluating satisfaction, to allow for a more detailed and multidimensional assessment.

The main reason reported by the 22 caregivers who indicated no improvement in their satisfaction with dental care was longer waiting times. A similar finding has been reported in previous studies; Buchmueller et al.[28] observed that the public insurance expansion increased dental service utilization but also lengthened waiting times. When comparing visits of patients who visited our hospital under the same staff and time conditions before and after the policy expansion, the increased patient volume was observed despite the number of available treatment schedules for patients with disabilities increasing 2.5 times per week, which may have placed additional strain on clinical capacity. To address this increased demand, not only an expansion of treatment schedules but also an increase in the number of dental professionals capable of treating patients with disabilities may be required. According to the 2019 report of the FDI World Dental Federation, Korea ranked 13th worldwide in the number of dentists[29], and data from the Health Insurance Review indicated a continuous increase in the number of dentists over the past decade since 2013[30]. Therefore, considering the sufficient number of dentists in Korea, enhancing education on dental care for individuals with disabilities, along with improving working conditions of dental professionals involved in such care, may contribute to improved access to dental treatment for these patients.

The main reason cited by 36 caregivers who responded that they did not perceive benefits from the reimbursement system was the absence of directly perceived benefits, and increasing financial benefits was suggested as a necessary improvement. When comparing the treatment fees covered by insurance for 106 patients during equivalent periods before and after the policy expansion, the average out-of-pocket cost per dental visit increased from approximately 21,546 KRW before the expansion to 33,347 KRW after the expansion, representing an increase of about 11,800 KRW per visit. This change may be related to the provision of more proactive procedures. A similar trend has been reported in a previous study. According to Kim et al.[31], following the expansion of dental insurance coverage, which allowed patients to receive previously delayed treatment, the resulting increase in patients' out-of-pocket expenses did not appear to have a positive effect on the perceived reduction in dental treatment costs.

Currently, the system remains largely dental provider-centered, with direct benefits for patients and caregivers mainly limited to fluoride application. According to previous domestic studies, the procedures most frequently claimed for insurance reimbursement in dental treatment for patients with disabilities over a five-year period were endodontic procedures, including endodontic canal preparation, pulp extirpation, canal irrigation, and canal enlargement, followed by scaling[32]. However, neither of these procedures is directly perceived by patients as part of the covered benefit range.

Prior studies have shown that economic factors are a leading cause of unmet dental care needs among people with disabilities, and that treatment costs for children with disabilities tend to be higher than for those without disabilities[4,33]. If caregivers do not perceive tangible benefits, this may act as a psychological barrier and discourage dental care utilization, as also noted by Kim et al.[34]. Therefore, to reduce barriers to dental care for patients with disabilities, additional financial policy support may be necessary. For such policy strengthening, long-term socioeconomic evaluations of dental care for children with disabilities would be valuable.

In this study, only 21% of caregivers demonstrated accurate knowledge of the system, and dental care staff were identified as the most common source of awareness. These findings may suggest that dental professionals play an important role in enhancing caregivers' understanding of the system. A previous study has also reported that dental professionals play a key role in improving caregivers' access to such systems[35]. Therefore, strengthening educational programs for dental professionals and establishing a framework that enables them to deliver consistent information to caregivers may help improve caregivers' understanding of the system.

This study holds significance as the first to evaluate, from the caregivers' perspective, changes in the clinical environment and satisfaction one year after the expansion of the system, with the aim of assessing its practical impact on clinical practice. Moreover, practical clinical changes, such as shorter dental visit intervals and an increased number of treatments, were observed, which may serve as preliminary evidence suggesting the potential value of conducting larger-scale studies to establish more meaningful clinical implications.

This study has several limitations. It was a small-scale, single-institution, cross-sectional study conducted over a short period, which may limit the generalizability of the findings and make it difficult to establish long-term causal relationships between the policy expansion and improvements in satisfaction and visit frequency. As a preliminary investigation with a limited study period and sample size, reliability and validity testing of the questionnaire could not be conducted, and dichotomous response items were used for convenience, which may have introduced response bias and reduced reliability.

To enhance the reliability and generalizability of future research, larger-scale and multi-center or regionally stratified studies involving more diverse populations are needed. Longitudinal or quasi-experimental research could help evaluate sustained changes in the clinical environment and caregiver satisfaction. The use of more detailed questionnaires with five-point Likert scales and verified reliability measures, such as Cronbach's α or test-retest analysis, along with objective clinical indicators such as the incidence of dental caries, may strengthen the credibility of future findings.

Conclusion

This pilot study suggests that the policy expansion may have contributed to practical clinical changes and improvements in caregiver satisfaction, which may in turn reflect positive trends in clinical practice. However, challenges such as workforce shortages and financial limitations remain. Addressing these issues through strengthening dental education for dental professionals who treat patients with disabilities and enhancing financial support may help reduce practical barriers and promote more equitable access to dental care. In the future, large-scale and longitudinal studies are needed to enhance the reliability of the findings and to assess the long-term effects of the expanded system on clinical outcomes and patient- and caregiver-centered satisfaction.

Conflicts of Interest

The authors have no potential conflicts of interest to disclose.

CRediT authorship contribution statement

So Dam Lee: Data curation, Formal analysis, Investigation, Methodology, Visualization, Writing – original draft, Writing – review & editing. **Ko Eun Lee:** Conceptualization, Data curation, Investigation, Methodology, Project administration, Resources, Supervision, Validation, Writing – review & editing. **Ji Eun Chung:** Conceptualization, Data curation, Methodology, Validation, Writing – review & editing. **Seong Joon Lee:** Resources, Writing – review & editing. **Chung-Min Kang:** Resources, Writing – review & editing. **Je Seon Song:** Resources, Writing – review & editing. **Hyung-Jun Choi:** Resources, Writing – review & editing. **Jae Ho Lee:** Conceptualization, Data curation, Investigation, Methodology, Project administration, Resources, Supervision, Validation, Writing – review & editing.

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