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Rising cognitive behavioral therapy claims among Japanese youth despite population decline: A retrospective study using the National Database of Health Insurance Claims (FY 2014–2022)

Masahide Usami[1,*], Masaya Ito[2], Yoshinori Sasaki[1,3], Masahiro Ishida[4], Saori Inoue[5], Katsunaka Mikami[6], Noa Tsujii[7], Hiroaki Kihara[8], Naoko Satake[9]

[1] Department of Child and Adolescent Psychiatry, National Kohnodai Medical Center, Japan Institute for Health Security, Chiba, Japan;
[2] National Center for Cognitive Behavior Therapy and Research, National Center of Neurology and Psychiatry, Kodaira, Japan;
[3] Department of Psychiatry and Behavioral Sciences, Institute of Science Tokyo Graduate School, Tokyo, Japan;
[4] Department of Psychiatry, Fukuoka University, Fukuoka, Japan;
[5] Department of Child Psychiatry, Ehime University Graduate School of Medicine, Toon City, Japan;
[6] Department of Psychiatry, Tokai University School of Medicine, Kanagawa, Japan;
[7] Department of Child Mental Health and Development, Toyama University Hospital, Toyama, Japan;
[8] Department of Neuropsychiatry, Kanazawa Medical Universiry, Ishikawa, Japan;
[9] Department of Psychiatry, National Kohnodai Medical Center, Japan Institute for Health Security, Chiba, Japan.

Abstract: Cognitive behavioral therapy (CBT) is reimbursed under the national insurance system of Japan, although predominantly for adults. Recent mental health crises among children and adolescents have prompted policy reforms to expand access to CBT. This study aimed to assess trends in CBT insurance claims among Japanese youth (0–19 years) from fiscal year 2014–2022 using national claims data. Outpatient psychotherapy and CBT claims from the National Database of Health Insurance Claims (NDB) were analyzed and stratified by age group. Linear regression was applied to assess trends. The number of CBT claims for youth increased markedly from 691 (1.5%) in 2014 to 4,497 (12.8%) in 2022, with significant upward trends for ages 5–9, 10–14, and 15–19 (all $p < 0.05$). Claims for adults declined during the same period. The use of CBT among children and adolescents in Japan has grown substantially, but most protocols remain adult-oriented. These results highlight the need for child-specific CBT programs and broader provider eligibility. A key limitation is that the data lacked disorder-specific information, which restricts analysis of treatment indications.

Keywords: adolescents, CBT, NDB, psychotherapy, youth

1. Introduction

Cognitive Behavioral Therapy (CBT) is a well-established, evidence-based intervention; however, its widespread implementation remains limited by persistent barriers to access (*1-3*). The need for broader dissemination is supported by clinical trials demonstrating its efficacy across a range of conditions, including subthreshold depression and other forms of psychological distress (*4,5*). As a scalable intervention, CBT holds promise for addressing workforce shortages and facilitating the integration of empirically supported treatments into pediatric mental health services (*6*).

The reimbursement of CBT is a key policy in Japanese mental health problems, but most patients have been adults. CBT was first promoted in fiscal year (FY) 2010 by the Ministry of Health, Labour and Welfare (MHLW) to improve treatment of depression and reduce risk of suicide. In Japan, training for CBT and its implementation are predominantly centered around adults.

Recent trends indicate a marked increase in incidence and prevalence of neurodevelopmental disorders among Japanese youth, including autism spectrum disorder and attention-deficit/hyperactivity disorder, as confirmed by a recent nationwide study using the National Database of Health Insurance Claims (NDB) (*7-9*). In FY 2024, there were 524 deaths from suicide under the age of 18, the highest number ever recorded in Japan. These mental health challenges among children and adolescents have prompted policy initiatives to expand access to children's mental health services (*10*).

A previous study highlighted significant regional

disparities in availability of child and adolescent mental health professionals in Japan, revealing a marked imbalance in distribution of specialists, particularly between rural and urban areas (*6*). Rural regions suffer from a severe shortage of child psychiatry specialists, with a 4.7-fold difference in student-to-specialist ratios compared to urban areas. Rural areas also have the greatest need for additional support regarding access to mental health resources (*i.e.*, specialists, mental health facilities) and rates of truancy, bullying, suicide, and child abuse. Aside from reflecting individual and familial challenges, these findings also expose systemic gaps in terms of early intervention and sustained mental health support (*10*).

From a health policy perspective, the MHLW has enacted progressive reimbursement reforms to encourage early intervention and psychosocial treatment. Initially, CBT was reimbursed only when facilitated by physicians, but subsequent amendments in 2016 and 2018 allowed nurses to deliver certain components under physician supervision, aiming to alleviate the shortage of specialized providers. In March 2021, a refined point system was introduced with a strict limit of 16 sessions per series as well.

Mental health challenges among children and adolescents in Japan, including an increase in school absenteeism, suicide rates under the age of 18, and neurodevelopmental disorders, have prompted major policy initiatives aimed at expanding access to mental health care. Randomized controlled trials in the United States and Europe have demonstrated that interventions tailored to children and adolescents, such as Trauma-Focused CBT (TF-CBT) and the Unified Protocol for Children (UP-C), can significantly reduce symptoms and improve functional gains compared to standard adult-oriented protocols.

Although research on CBT for children and adolescents in Japan has steadily increased in recent years, access to these evidence-based interventions remains uneven across regions. In many clinical settings, CBT protocols originally designed for adults with depression are routinely applied to younger populations without formal adaptations, primarily due to lack of standardized youth-specific manuals within the national reimbursement framework. Nonetheless, recent implementation studies indicate that culturally tailored CBT programs for Japanese youth are both feasible and increasingly undergoing pilot testing (*11*).

These programs have expanded particularly in school settings, utilizing simplified materials and familiar cultural references (*11*). For example, one study reported that 60.9% of participating children no longer met diagnostic criteria for anxiety disorders after treatment, and trauma-focused CBT was associated with improvements in PTSD symptoms and social functioning (*12,13*). Additional evidence supports CBT's effectiveness in educational settings: a group-based intervention for upper elementary students reduced depressive symptoms and improved social skills, while more recent trials of transdiagnostic CBT protocols customized for adolescents have shown promise for broader applicability (*14,15*).

Nevertheless, CBT services for children remain limited in availability throughout Japan. Persistent regional disparities and structural barriers — such as insufficient clinical training, partial insurance coverage, and inadequate dissemination — continue to impede access. To explore this gap between research and real-world practice, the present study analyzes national trends in insurance claims for CBT among children and adolescents aged 0–19, with a focus on age- and region-specific patterns.

This study evaluated the impact of recent insurance reforms on annual CBT claim counts among children and adolescents (0–19 years), focusing on age-specific trends.

2. Methods

2.1. Japan national insurance system for CBT

In 2010, CBT was first made eligible for coverage under the national insurance system when delivered by physicians; however, services provided by nurses were not reimbursed at that time. In 2016, to reduce physician burden, reimbursement was allowed when part of the conversation is conducted by a full-time nurse with a certain level of knowledge and experience under the direction of a physician. Subsequent revisions to the reimbursement policy have primarily focused on addressing adult depression. A comprehensive overview of these insurance code modifications related to CBT reimbursement is presented in Supplemental Table S1 (*https://www.globalhealthmedicine.com/site/supplementaldata.html?ID=107*). In this study, each CBT claim corresponds to a single reimbursed session under the Japanese national insurance system. As a peculiarity of the Japanese CBT insurance medical system, all CBT claims still require physician involvement, either directly or *via* supervision of a nurse. Psychologists cannot claim insurance reimbursement for cognitive behavioral therapy in Japan.

2.2. Data source

This study examined how these policy changes have affected outpatient psychotherapy use among children and adolescents nationwide. Publicly available data from FY 2014–2022 was analyzed to determine whether the reforms correlated with increased access to psychotherapy and to elucidate any emerging trends or gaps, particularly among younger age groups. The classification of psychotherapy categories (general psychotherapy, CBT, psychoanalysis, psychosomatic

therapy, and group therapy) followed the official medical fee schedule as defined in the Japanese Health Insurance Claims Manual issued by the MHLW.

2.3. Study population and outcome measures

This study focused on outpatient psychotherapy claims that included additional charges for child/adolescent services. Data regarding total annual claims (for all ages and those aged 0–19 years) in FY 2016–2022 was collected from all forms of psychotherapy and specifically from CBT. To analyze differences in utilization, patients were divided into several age groups (0–4, 5–9, 10–14, and 15–19 years). The primary outcome measure was the annual number of psychotherapy claims (including CBT) per 100,000 individuals in these age groups. Using population estimates from the Basic Resident Register, the annual CBT claim rates per 100,000 population were also calculated for each age group (Ministry of Internal Affairs and Communications, 2024).

2.4. Statistical analysis

Descriptive analyses were conducted to determine the proportion of individuals aged 0–19 who received psychotherapy, specifically CBT, for each fiscal year. To assess temporal trends in utilization, the ordinary least squares linear regression was applied to annual counts (FY 2014–2022 for overall trends; FY 2016–2022 for additional fees). A proportion analysis was conducted, calculating the fraction of psychotherapy/CBT claims for children/adolescents (0–19 years) relative to the total for all ages per year. An age-stratified trend analysis involved fitted simple linear regression models, using fiscal year as the independent variable to estimate the annual change (slope β), *p*-value, and coefficient of determination (R^2) for each subgroup.

We addressed reviewer concerns about the limited data points and model assumptions by applying logistic transformation to proportion data and re-examining age-stratified trends in CBT claims *via* ordinary least squares (OLS) regression. The annual number of CBT claims was initially standardized as a proportion of the highest value observed across all years for each age group. The logit transformation was subsequently applied: $\text{logit}(p) = \log((p + 1e{-}5) / (1 - p + 1e{-}5))$, where ε was set to 1e−5 to prevent undefined results. Regression models were evaluated for each age group (0–4, 5–9, 10–14, 15–19 years), providing results for slope (β), 95% confidence intervals, *p*-values, and R^2. The Benjamini–Hochberg false discovery rate correction was used to account for multiple testing.

A two-sided p-value < 0.05 was considered statistically significant. Analyses were performed using PRISM for Mac (GraphPad Software, Boston, USA) and complemented with standard statistical software for confirmatory checks.

2.5. Ethics

Because the data was publicly available and anonymized in the NDB Open Data system, no ethical approval was required. This approach complies with the Japanese guidelines regarding secondary use of de-identified administrative data.

This study adhered to the ethical principles of secondary use of anonymized data as outlined in the "Ethical Guidelines for Medical and Health Research Involving Human Subjects" issued by the Ministry of Education, Culture, Sports, Science and Technology and the MHLW.

3. Results

3.1. Declining birthrate in Japan

According to the national census data, the total population of Japan decreased from 127.10 million in FY 2014 to 122.49 million in FY 2022. Similarly, the population under 19 years old fell from 22.54 million in FY 2015 to 20.65 million in FY 2022 (a reduction of 1.89 million), clearly demonstrating the ongoing demographic decline in Japan.

3.2. Distribution of psychiatric claims among children and adolescents

The total outpatient psychotherapy claims (including general psychotherapy, CBT, psychoanalysis, psychosomatic therapy, and group therapy) increased from 59.5 million in FY 2014 to 69.4 million in FY 2022 (+16.5%) (Table 1), indicating a rising demand, increased public awareness, and expanded access to evidence-based psychiatric services. Among individuals aged 0–19 years, claims increased from 2,604,906 in FY 2015 to 4,365,557 in FY 2022 (+67.6%). The most notable year-on-year increase occurred between FY 2020 and FY 2021, during the COVID-19 pandemic.

3.3. Annual psychotherapy and CBT trends

Table 2 presents the total number of outpatient psychotherapy claims from FY 2014 to 2022. From FY 2014 to 2022, the proportion of younger patients (0–19 years) with outpatient psychotherapy claims increased from 4.1% to 6.3% for all types of psychotherapy and from 1.5% to 12.8% for CBT specifically. During the same period, the proportion of CBT among all psychotherapy claims increased from 4.3% in FY 2014 to 23.2% in FY 2022. Figure 1 shows a rising rate toward younger recipients of CBT during this period. Table 2 shows that CBT's share of all psychotherapy claims declined slightly from approximately 0.075% in

FY2014 to 0.051% in FY2022, while for patients aged 0–19 it increased from nearly 0% to 0.007%, reflecting a demographic shift in service utilization across age groups. During the same period, the proportion of CBT among all psychotherapy claims increased from 4.3% in FY 2014 to 23.2% in FY 2022. Figure 2 shows CBT claims per 100,000 population by the 0- 19 age group, which accounts for demographic shifts over time and highlights utilization trends.

Table 1. Yearly trends in the number of outpatient psychotherapy claims

Fiscal year	Number of claims		%
	All Ages	0–19 years	
2014	46,277,930.00	4,642,656.00	10.03%
2015	47,741,947.00	5,085,490.00	10.65%
2016	48,252,633.00	5,404,208.00	11.20%
2017	48,963,364.00	5,916,930.00	12.08%
2018	51,440,193.00	6,292,346.00	12.23%
2019	52,899,920.00	6,680,150.00	12.63%
2020	51,785,332.00	6,982,524.00	13.48%
2021	54,995,840.00	8,032,054.00	14.60%
2022	56,344,049.00	8,386,488.00	14.88%

3.4. Age-stratified analyses and linear regression results

Table 3 describes the number of CBT claims stratified per age group (0–4, 5–9, 10–14, and 15–19 years) from FY 2014 to 2022 alongside the linear regression results (slope, *p*-value, R^2).

A simple linear regression using the fiscal year as the independent variable yielded the following slopes (β) and statistical indices. For the 0–4 years subgroup, there was no significant change in claims (β = –1.65; 95% CI: –5.1 to 1.8; $p = 0.272$; $R^2 = 0.17$). Significant upward trends were seen with both the 5–9 years subgroup (β = +64.28; 95% CI: 32.4 to 96.2; $p = 0.0033$; $R^2 = 0.73$) and 10–14 years subgroup (β = +147.22;

Table 2. Annual psychotherapy and cognitive behavioral therapy usage in Japan (FY 2014–FY 2022)

Fiscal Year	All Psychotherapy			Cognitive Behavioral Therapy			Population
	All Ages	0–19 years	%	All Ages	0–19 years	%	0–19 years
2014	59,488,413	2,423,135	4.07%	44,888	691	1.54%	22,770,002
2015	61,191,289	2,604,906	4.26%	42,216	2,518	5.96%	22,541,461
2016	61,839,713	2,810,594	4.54%	44,660	630	1.41%	22,383,548
2017	63,418,056	3,054,238	4.82%	43,422	680	1.57%	22,175,187
2018	64,805,124	3,269,494	5.05%	38,923	2,445	6.28%	21,954,522
2019	66,198,805	3,461,649	5.23%	37,384	2,918	7.81%	21,692,242
2020	64,549,221	3,614,392	5.60%	35,470	3,003	8.47%	21,405,309
2021	68,141,614	4,170,348	6.12%	37,562	4,125	10.98%	21,037,894
2022	69,439,156	4,365,557	6.29%	35,231	4,497	12.76%	20,655,250

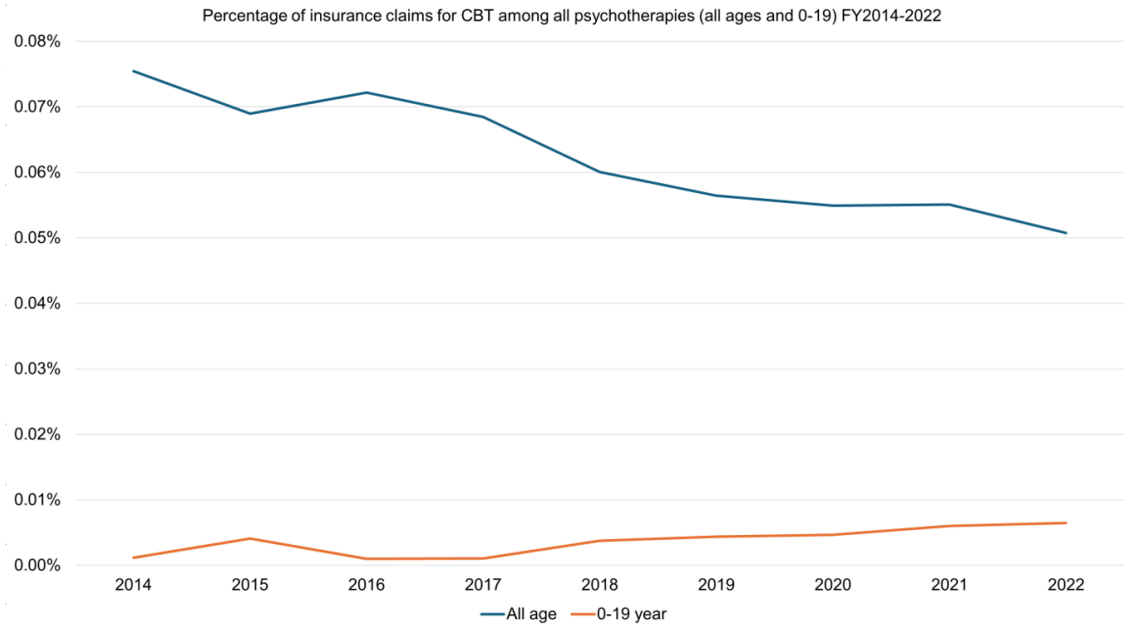

Figure 1. Trends in the share of CBT claims among all psychotherapy claims (FY 2014–2022). CBT's share of all psychotherapy claims fell from about 0.075% in FY2014 to 0.051% in FY2022, while for patients aged 0–19 it climbed from nearly 0% to 0.007% over the same period.

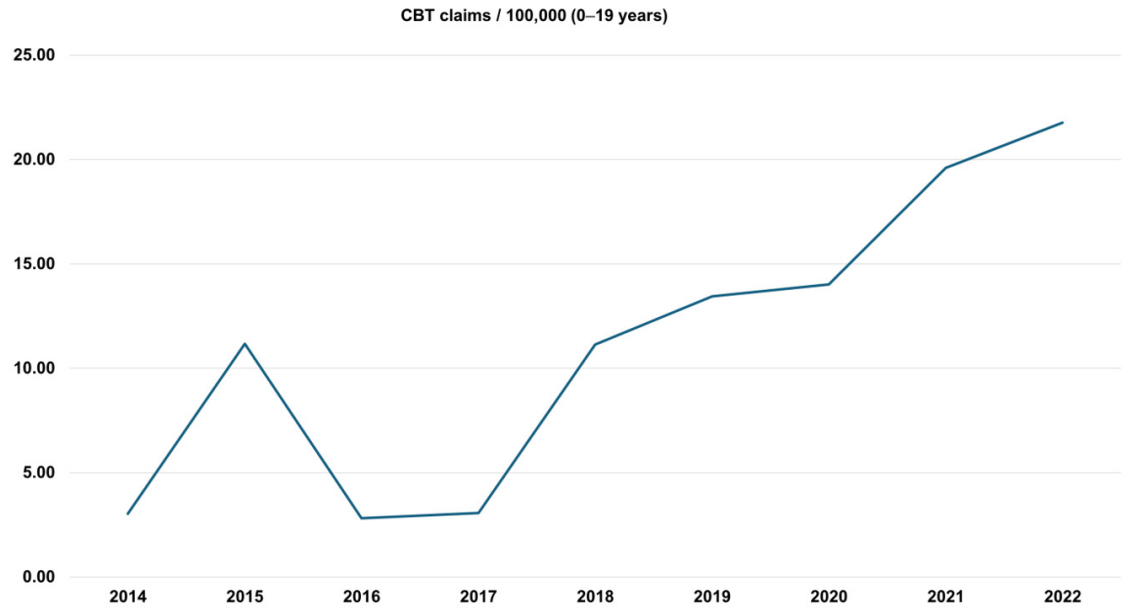

Figure 2. Trends in CBT claims per 100,000 population among individuals aged 0–19 years, FY 2014–2022.

95% CI: 102.5 to 191.9; p = 0.00089; R^2 = 0.81). For the 15–19 years subgroup, there was substantial growth with moderate model fit (β = +240.63; 95% CI: 65.4 to 415.8; p = 0.0177; R^2 = 0.58). Overall, marked and consistent growth was seen among Japanese youth aged 0–19 years (β = +530.66; 95% CI: 360.5 to 700.8; p = 0.00014; R^2 = 0.85).

These results suggest that the primary drivers of increased CBT utilization among youth are in seen in those aged 5–9, 10–14, and 15–19 years. However, the negligible CBT utilization in the 0–4 years age bracket likely reflects the developmental unsuitability of standard adult CBT manuals for toddlers, who predominantly require play-based and parent-mediated interventions tailored to their cognitive level.

Table 3 provides a summary of the findings from the logit-transformed regression analyses. Upward trends statistically most significant and robust were observed in the 10–14 and 15–19 year age brackets, with p-values adjusted to less than 0.01, followed by the 5–9 year age group, where the adjusted p-value was less than 0.05. No significant trend was observed in the 0–4 year age group. These results confirm the initial patterns of behavior while resolving the shortfalls of employing raw count-based OLS regression.

4. Discussion

4.1. Trends and systemic barriers in CBT provision for children and adolescents in Japan

This study revealed a substantial and consistent increase in CBT claims among children and adolescents (0–19 years) in Japan from FY 2014 to FY 2022. In contrast, CBT claims among adults showed a declining trend during the same period, resulting in a relative shift in service provision toward younger age groups.

The NDB data from FY 2014 to 2022 revealed that CBT claims were decreasing for all ages but increasing for children (0–19 years). Notably, the CBT protocols covered by reimbursement are all intended for adults. In Japan, the protocols specified in the reimbursement are not always followed for children and adolescents. The CBT claims for young patients are likely not based on protocols such as TF-CBT or UP-C, which have demonstrated higher levels of empirical support for youth. TF-CBT has shown efficacy in randomized controlled trials, while UP-C has yielded promising results in quasi-experimental studies (*12,14*).

CBT is widely acknowledged as an effective therapeutic modality for various mental health problems. Unfortunately, systemic and administrative factors have historically limited its accessibility in Japan. For instance, only physicians (or in certain cases, nurses working jointly with physicians) could formally bill for CBT under national insurance. Psychologists were largely unable to claim insurance reimbursement directly, despite being key providers of psychotherapeutic interventions in many countries. Consequently, psychologists often had to operate under a physician's supervision for billing, hindering the growth and dissemination of CBT. Furthermore, the commonly imposed 16-session limit has traditionally restricted treatment duration for patients requiring more extensive care, such as those with chronic conditions or severe symptoms that require continued support. This is particularly problematic in cases involving children and adolescents, who benefit from more developmentally

Table 3. Number of cognitive behavioral therapy (CBT) claims by age subgroup (FY 2014–2022)

Age group	All Psychotherapy									Cognitive Behavioral Therapy			
	2014	2015	2016	2017	2018	2019	2020	2021	2022	Slope (β)	95% CI Lower	95% CI Upper	*p*-value	R^2
0–4 years	0	33	0	0	0	0	0	0	0	-0.35	-1.06	0.35	0.27	0.17
5–9 years	0	127	0	0	61	121	286	479	527	1.20	0.16	2.23	0.03	0.52
10–14 years	150	352	65	76	398	645	949	1,140	1,183	0.39	0.14	0.64	0.01	0.66
15–19 years	541	2,006	565	604	1,986	2,152	1,768	2,506	2,787	0.79	0.17	1.41	0.02	0.57
Overall (0–19 years)	691	2,518	630	680	2,445	2,918	3,003	4,125	4,497	0.82	0.48	1.17	0.004	0.77

Remark: A minus sign (−) is preferred over a hyphen (-) for indicating negative values.

attuned interventions that may not necessarily fit into a short-term treatment protocol. In particular, play-based techniques, collaboration with parents and schools, and other adaptations require flexibility that can be undermined by the limit on the number of sessions.

Although our findings demonstrated a steady rise in CBT claims among youth, the absence of diagnostic information in the NDB dataset limited our ability to determine which conditions (*e.g.*, anxiety disorders, depression, or neurodevelopmental disorders) were associated with the increase. This lack of granularity posed challenges in interpreting whether CBT services had been equitably distributed across diagnostic categories or whether certain populations had remained underserved. To address these gaps, future research could utilize linked datasets that combine insurance claims with electronic health records, or implement provider-level surveys that document clinical indications for CBT. Such efforts would support a more targeted allocation of training resources and assist policymakers in refining CBT training program and guidelines within child and adolescent mental health services.

4.2. New system for child and adolescent support claims

Although the overall number of claims increased in FY 2016 due to less strict criteria for CBT claims, the number of claims for the 0–19 age group decreased from the previous year. However, this could be attributed more to new additions to the Child and Adolescent Additions introduced in FY 2016 rather than with the CBT claim requirements. After 2016, the MHLW revised reimbursement policies to improve access to psychiatric care for children and adolescents in response to increasing concerns over developmental disorders, school absenteeism, and suicide among youth. From FY 2016 to 2021, several additional reimbursement fee categories were gradually implemented for outpatient psychotherapy.

Psychologists were allowed to bill for services provided to minors, and higher reimbursement rates were offered without the 16-session restriction. These changes helped alleviate long-standing obstacles regarding children's mental health in Japan. Psychologists can now deliver therapy more freely, and patients who need protracted care can receive it for up to two years on a weekly basis. Many clinicians, such as psychiatrists, nurses, psychologists, and social workers, can treat children with mental illness using various types of psychotherapy, including CBT. In Japan, where child and adolescent psychiatric resources remain limited, digital delivery — *via* apps or online platforms — holds promise not only for expanding access to CBT for youth, but also for training child psychiatrists and other medical professionals to deliver CBT (*16-19*).

Further reforms that allow psychologists to claim reimbursement independently across all age groups could possibly help increase access to CBT and reduce treatment gaps, especially in underserved regions. This robust upward trajectory highlights an increasing demand for CBT, underscoring the urgent need for accelerated CBT workforce training. Additionally, pilot digital CBT initiatives should be established in low-resource prefectures to ensure equitable access. Concurrently, development of interdisciplinary CBT training curricula, leveraging skills of psychiatrists, psychologists, nurses, and social workers, can facilitate upscaling of high-quality CBT services for children and adolescents.

Therefore, Policy recommendations include *i*) expanding insurance eligibility to allow independent claims by licensed psychologists, *ii*) establishing regional CBT training hubs, and *iii*) piloting child-specific CBT protocols (*e.g.*, TF-CBT, UP-C) within the national reimbursement system.

4.3. Limitation

Since this study analyzed absolute claim counts without reference to population denominators, changes in the underlying population size were unaccounted for. Future research should analyze per capita rates to provide a more nuanced understanding of service utilization trends.

The NDB Open Data lacks disorder-specific information, outcome measures, and granular age breakdowns, limiting analysis of indications for CBT, treatment effects, and age-specific needs. Lack of disorder-specific data makes it impossible to ascertain which diseases CBT is typically being utilized for (*e.g.*, depression, anxiety, OCD, or PTSD) and which populations might be most in need of expanded services. This lack of diagnostic granularity also restricts our ability to determine whether CBT utilization was primarily for depression, anxiety, developmental disorders, or other indications.

The NDB Open Data also lacks direct outcome measures, precluding large-scale evaluations of short- and long-term responsiveness to CBT. Researchers cannot gauge symptom trajectories, relapse rates, or functional improvements, thereby hindering any robust assessment of therapy effectiveness.

Although the database organizes claims data in various ways, it does not allow sufficiently granular age breakdowns at certain analytic levels. This shortcoming hinders the investigation of how younger children, older children, and adolescents differ in their use of/need for specialized CBT approaches.

Prior to the Child and Adolescent Support Add-on, psychologists were generally unable to bill directly for CBT, and a 16-session limit was often applied under standard codes. This new add-on addresses several of these issues, and future work is needed to determine whether similar reforms would also be applicable to adults or other psychotherapeutic interventions.

Although prefecture-level CBT claim data are unavailable, previous studies have identified regional disparities in access to child mental health services. Digital CBT and mobile delivery models should be explored to address access gaps in underserved areas.

5. Conclusion

Based on the NDB Open data, the use of CBT in Japan has been increasing, especially among the youth, from FY 2014 to 2022. This increase is unrelated to the FY 2022 Child and Adolescent Support Add-on, which is beyond the study period. Future analyses should assess the long-term effects of this reform on CBT access across all ages.

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**Address correspondence to*:
Masahide Usami, Department of Child and Adolescent Psychiatry, National Kohnodai Medical Center, Japan Institute for Health Security, 1-7-1 Kohnodai, Ichikawa, Chiba, 272-8516, Japan.
E-mail: usami.m@jihs.go.jp