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ORIGINAL ARTICLE

The impact of public assistance on child mental health in Japan: results from A-CHILD study

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Abstract

Public assistance is one option for providing a safety net to protect the health of children, but assistance may also generate feelings of shame that impact self-esteem. This study aims to elucidate the impact of public assistance on child mental health. We used cross-sectional data on 6920 first graders from the Adachi Child Health Impact of Living Difficulty (A-CHILD) study. We found children living in relative poverty had more behavioral problems, low resilience, and were likely to refuse to go to school. After propensity-score matching among low-income households, the likelihood of children refusing to go to school was larger in the families receiving assistance as compared to non-recipients (OR 4.00, 95% CI 0.85–18.84) although there were no significant differences between recipients and non-recipients in low-income households. Our study produced insufficient evidence to indicate that social assistance is associated with child mental health, resilience, or school refusal.

Keywords Child poverty · Public assistance · Mental health · Propensity-score matching · School refusal

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Introduction

Living in poverty puts children at a great disadvantage. Relative poverty does not merely indicate a lack of income but also deprivation of material [1–3]; of opportunities such as family processes including family events and interactions between parents and children [1–4]; and of social participation. All of these are widely encouraged or approved by society [1, 3, 5]. As a result, children living in poverty are at risk of damage to their physical health [2, 6], neurodevelopment [2, 7], educational attainment [2], and mental health [8]. The percentage of children living in relative poverty was 13.4% across member countries of the Organization for Economic Cooperation and Development (OECD) in 2015 [9] and 17.0% in 89 countries around the world [10]. Relative child poverty rates are increasing in some countries, including Japan [11] with 13.9% in 2015 [12, 13], which was relatively high compared to other OECD countries [9].

Among the many programs and welfare policies that aim to diminish the negative impact of poverty on children, provision of financial assistance is the most common [14]. A study that examined the long-running impacts of the Mothers' Pension program, the first federal government-sponsored welfare program (1911–1935) in the United States (US) involving cash transfers, showed children of recipients had higher educational attainment, lower obesity rates, higher income in adulthood, and longer lives [15] than children whose mothers applied to join the program, but were rejected. A study of this historic program showed cash transfers benefitted maternal and child health, while the Temporary Assistance for Needy Families (TANF), today's U.S. cash transfer program (in effect from 1999), showed no effectiveness on maternal and child life and health [16].

Cash transfer policies have several problems for child mental health: potential lack of provision of material necessities as well as potential lack of positive parenting and social inclusion for children. Although the TANF relies on the abilities of welfare recipients to allocate their financial assistance so that they can buy the necessities of their children, recipients often experience material hardship [17]. This hardship indicates a potential shortcoming in cash transfer to improve child health: a possible failure to provide necessary materials or opportunities, or both. Researchers compared mothers in the U.S. who left the cash transfer program (Aid to Families with Dependent Children, AFCD, 1935–1999, which was superseded by TANF from 1999) to work in the 1990s with middle-income, working parents. The latter were able to use work benefits such as paid sick leave, vacation leave, and flexible hours to supplement cash in a way that is not available to parents leaving AFDC or TANF welfare programs [18]. This finding revealed that the importance of parenting is often neglected when policy changes, and that strict work requirements decreased parental time to care for their children [16, 18].

The effectiveness of cash transfer in Japan to support child health is unknown. Japan's welfare policies are designed to assist people experiencing difficulties earning a living despite using all of their assets, abilities, and available resources. Public assistance in Japan, or *seikatsuhogo* is aimed at guaranteeing a minimum

standard of living and promoting self-reliance [19]. Although every citizen has the right to claim the assistance, it is applied after careful examination of whether the minimum cost of living exceeds the household income or not. The minimum cost of living is calculated from seven categories of expenses: living, housing, education, medical, occupational, and funeral expenses, taking into account the differences in costs associated with living areas such as urban and rural areas. Recipients may receive cash for living expenses (the minimum level), set as the difference between the minimum cost of living and household income, in addition to services and direct payments for medicine and other necessities for family members, including their children. Although the assured income level in Japan is relatively high compared to other OECD countries [20], expenditure patterns observed among welfare recipients and low-income households indicated child material hardship within a recipient household may be critically problematic [21, 22]. This topic has not yet been addressed in Japan.

In addition to the work requirement (recipients must be willing to work and must take vocational guidance after application if they are eligible to work), they must have exhausted all cash reserves and other resources before receiving financial assistance. Both of these requirements may accelerate social exclusion [22] by taking up recipients' time or other resources for socialization. Discrimination or stigma reported in other countries [23] could be intensified in Japan given the relatively low take-up rate for cash transfers. In 2017, the percentage of people receiving public assistance was 1.69% [24]. The 10–25% take-up rate among those eligible to receive public assistance [24–28] was lower than rates in other OECD countries: 40% to 90% [29]. Japan's low rate may be related to the findings that Japanese participants of public assistance tend to be less socially active [22] and suffer from mental stress [30]; either may effect child health.

This low take-up rate enables us to assess the impact of public assistance on recipients by comparing with those whose economic hardships are similar to the recipients because low take-up rate means a substantial number of needy people are kept from gaining the assistance. In addition, given the practice of "shoreline operation" tactics in Japanese local governments, in which they refuse eligible welfare applicants partially due to strong stigma towards recipients [20, 31], comparison of recipients and non-recipients with similar economic hardships would be expected to provide better estimates of the impact of public assistance. Previous studies in the U.S. found inconsistency on the effects on child health, partially due to cultural differences across ethnic groups [32], to ages of children. In addition, researchers failed to describe in detail how recipients' child contexts differ [32], and to show the impact of welfare system on child mental health [33].

Thus, this study aimed to describe child mental health status in families receiving public assistance in Japan, and to elucidate the impact of public assistance on child mental health. Since poverty is associated with deprivation of material, opportunities and social participation [1], we also aimed to test whether public assistance may have a negative impact on material components (such as material deprivation), familial components (such as parenting), and social components (such as social capital) of child living.

The Adachi Child Health Impact of Living Difficulty (A-CHILD) study aimed to investigate child living conditions and health in Adachi City, Japan, a city that tries to improve the child poverty situation through various policies and practices. The A-CHILD study is the first population-based study targeting all the caregivers of first-grade children (aged 6–7 years) and collecting detailed information of child life and health, thus suited to examine the current hypothesis.

Materials and methods

Participants

We used data from the Adachi Child Health Impact of Living Difficulty (A-CHILD) study conducted in July and November 2015 and October 2017. (Details of the study have been described elsewhere [34–36].) The survey targeted caregivers of all 6- to 7-year-old children attending public elementary schools at the time of surveys (total elementary schools $N=69$) in Adachi city, Tokyo, Japan. Our study team distributed self-report questionnaires with a unique anonymous ID to 5355 and 5160 first-grade children in 2015 and 2017, respectively. School staff asked children to pass on the questionnaire to their caregivers to complete, then return them to the school. A total of 4467 and 4428 participants returned questionnaires in 2015 and 2017, respectively. Among that, 4291 and 4208 caregivers consented to include their children in the study (response rate 80.1% and 81.6%, respectively). We excluded responses that did not include public assistance status and income status ($N=1579$, 18.6%). We analyzed data from a total of 6920 participants (Supplementary Fig. 1).

Measurement

We divided participating children into three groups according to public assistance status and household income status (Supplementary Table 1): (1) children in households that had received or were receiving public assistance; (2) children in low-income households that have never received public assistance, and (3) children in middle-income households that have never received public assistance. The questionnaire asked caregivers whether their families received any public assistance in the past year. Participants chose one of these responses: “Currently receiving”, “Received”, “Have not received”, and “Prefer not to answer”. We categorized respondents who answered “Currently receiving” and “Received” into the first group for considering the long-lasting effects of discrimination and stigma [37, 38]. Participants responded to questions about household income of the previous year, excluding social welfare, by selecting one of the following items: “less than 0.5 million yen” to “10 million yen or more”, and “do not know”. To standardize household disposable income, we divided the median value of each category by the square root of the number of household family members. Referring to the OECD child low-income definition [9], we set the thresholds of low-income at 50% of the median standardized household disposable income in Tokyo, that

is, 1,220,000 JPY [13]. Thus, children in low-income household are defined those whose household income is below 1,220,000 JPY.

We used the Japanese version of the Strength and Difficulties Questionnaire (SDQ) [39] to assess child mental health, a translation of the original questionnaire [40]. The SDQ enables multi-dimensional assessment of child mental health using subscales such as emotional symptoms, conduct problems, hyperactivity or inattention, peer relationship problems, and prosocial behavior including being concerned about friends. To calculate the total difficulties score, the scores of emotional symptoms, conduct problems, hyperactivity or inattention, and peer relationship problems were summed.

Assuming that school refusal reflects child mental well-being, and taking into consideration potential mental effects of school absenteeism [41, 42], the questionnaire asked caregivers, "Has your child missed school during the past 6 months since entering elementary school?" and we received responses from "yes," "no," or "I do not know". Most caregivers responded to the questionnaires in November. As April is the beginning of the fiscal year in Japan, the duration of the study period was 7 months from April to October in both 2015 and 2017. If caregivers answered "yes" to the question on missing school, they gave reasons by selecting from the following items: "due to illness/injuries", "due to family reasons (for example, bereavement)", "he/she did not want to go", or "other reasons". We counted those who selected "he/she did not want to go" as children who had refused to go to school.

We used the Children's Resilient Coping Scale (CRCS) to measure child resilience. It consists of eight items developed by Japanese experts to suit the Japanese context based on previous studies related to resilience [43, 44] and coping [45]. For each of the eight items, caregivers rated child behaviors using a scale of 0 (never) to 4 (very frequently). We converted the total score into a scale of 0–100; a higher total score indicated a higher level of resilience.

We separated child life components possibly affected by public assistance status into three: social component, familial component, and material component, as previously considered [2, 4, 5]. For the social component, we assessed parental perception of social capital, number of social support resources, and length of time living in their current residence. We scored social capital based on responses to the questions: "do you agree or disagree with the following statements? (1) people in your community can be trusted (social trust), (2) this community is close-knit (cohesion), and (3) people in your community are willing to help their neighbors (mutual aid)". The five-point Likert scale responses for each question were: "1 = strongly disagree", "2 = somewhat disagree", "3 = neither agree nor disagree", "4 = somewhat agree", and "5 = strongly agree". We calculated social capital scores as the arithmetic sum of responses to the three questions (Cronbach alpha = 0.86). For social support resources, we asked caregivers, "when you are truly troubled or in need of advice, is there anyone whom you can talk to?" and got responses either "yes" or "no". For those who answered "yes", the questionnaire also asked: "who (or where) are those people?" and caregivers selected answers from the 14 choices. We obtained the number of social support resources from the arithmetic sum of selected choices. All missing values were assumed to be 0. We calculated social component

scores as the arithmetic sum of social capital score and the number of social support resources (Cronbach alpha = 0.68).

For the familial component, we assessed parenting and child maltreatment. For parenting, the questions helped us to assess whether children ate breakfast every morning, whether children ate dinner with the family, whether caregivers cooked every day, whether caregivers finished brushing their children's teeth after their child brushed their own teeth and whether children went to preschool. We scored answers "yes" and missing answers as 1, to achieve conservative results, and scored "no" as 0. The sum of those 5 scores made up the parenting score (Cronbach alpha = 0.72). We also assessed parental interaction with children. Interaction scores were the sum of the following nine questions with response items on a five-point Likert scale with imputation of missing value as a mean of other scores: "caring about your child's study," "exercising with your child," "playing computer games with your child," "playing board games with your child," "talking about school life," "talking about social news," "talking about TV programs," "cooking together," and "going out together" (Cronbach alpha = 0.63). We assessed child maltreatment using three categories: physical abuse ("hitting your child's body (buttocks, hand, head, or face)" and "beating your child"); psychological abuse ("yelling at your child", "insulting your child repeatedly" and "having a big fight in front of your child"); and neglect ("shutting your child outside", "not feeding your child" and "leaving your child alone in the house at night") using a four-point Likert scale ranging from "1 = often" to "4 = not at all". If at least one answer was "1 = often", we classified caregivers as maltreating their child for the stated three categories of reasons, and coded whole missing values as "0 = no".

We assessed the material component in terms of deprivation of materials and learning opportunities for children. The survey asked caregivers whether or not they could not afford to have the following materials in households due to financial reasons: age-appropriate books, sporting goods, stuffed animals and toys for children, and room or space at home where the child can do homework. We also asked whether they had experience failing to pay the following costs in the previous year for financial reasons: fees for school field trips, fees or transportation costs for extracurricular classes, or school lunch fees. If caregivers reported experience with any of these hardships, we counted them as experiencing material deprivation or payment difficulties. We categorized missing values as not having such experiences. If they experienced either material deprivation or payment hardship, we counted them as "experiencing deprivation".

The Ethics Committee of the National Center for Child Health and Development approved this study (approval number:1147) and Tokyo Medical and Dental University (approval number:M2016-284).

Analysis

First, we used chi-square tests and ANOVA to assess respondents' characteristics and differences in terms of mental health, resilience, and the three components of child living conditions (material components, familial components, and social

components) among the three groups for categorical and continuous variables, respectively. And we assessed differences of each pair with chi-square tests and t-test with Bonferroni correction for categorical and continuous variables respectively. Second, we used propensity score to account for confounding between public assistance status and child mental health by matching children of low-income recipients with those of low-income non-recipients. Possible predictors for receiving public assistance were the sex of the child, the child's siblings, respondents of questionnaires, marital status, number of family members, parental smoking status, respondent's mental health (K6), whether parents had psychiatric disorders, headaches or insomnia, parental educational attainment, parental age, standardized household income, and the year of the survey (for categorization of variables, see Supplementary Table 1). We substituted categorical missing data and numerical missing data with dummy variables and median values, respectively. We used those predictors to estimate propensity score, applying the following algorithm for propensity-score matching: 1:1 optimal matching with caliper width equal to 0.2 and no replacement considering the previous reports [46]. We assessed the balance of possible confounders within the matched pairs using standardized bias, that was less than 20% for all covariates (Supplementary Table 3). Finally, using the matched pairs, we analyzed the difference in child mental health and risk factors between public assistance recipients and non-recipients with conditional regression analysis or conditional logistic regression analysis based on outcome type. Because the results did not change in terms of tendency, to maintain statistical power and avoid overestimation, we analyzed the missing data on school refusal ($N = 1132$, 16.4%) as the answer "no". All analyses were performed with STATA 15.0.

Results

The sample characteristics of each category appears in Supplementary Table 1. More parents in low-income households were divorced (42.93% vs 38.72% vs 2.61% for those in households receiving public assistance; those in low-income households not receiving public assistance; and those in middle-income households not receiving public assistance, respectively) and a higher proportion of public assistance recipients had never married (11.52% vs 5.31% vs 0.59%). Mothers in low-income households were likely to be smokers during the study period (42.93% vs 33.19% vs 12.16%).

Supplementary Table 2 shows the characteristics of the participants. Compared to children from middle-income families, children from low-income families or families who received welfare, showed significantly worse mental health (mean scores for total difficulties score were 11.76, 11.46, 9.93, and $p < 0.001$), resilience (mean scores were 64.40, 63.65, 66.19, and $p = 0.002$), and the higher number of children having refused to go to school ($N = 14$(7.33%), 17(3.76%), and 124(1.98%)). SDQ scores and CRCS scores were not significantly different between recipients and non-recipients among low-income families ($p = 1.000$ for SDQ total difficulties score and CRCS total score), but the mental health outcomes were worse in recipients across all scores, especially emotional symptoms (mean scores were 2.47 and

Table 1 Association between public assistance and child living conditions among low-income households before and after matching

Variables	Before matching				After matching			
	B	OR	95% CI	*p*-value	B	OR	95% CI	*p*-value
Social components								
Social components score	−0.75		−1.39 to −0.11	**0.021**	−0.15		−1.07 to 0.76	0.742
Social capital	−0.73		−1.23 to −0.22	**0.005**	−0.17		−0.94 to 0.60	0.659
Number of types of advisers	−0.02		−0.31 to 0.26	0.865	0.02		−0.38 to 0.42	0.925
Familial components								
Parenting score	−0.12		−0.25 to 0.01	0.074†	−0.16		−0.39 to 0.07	0.165
Eating breakfast everyday		0.79	0.48 to 1.29	0.347		0.80	0.37 to 1.71	0.565
Eating dinner with family		0.80	0.40 to 1.60	0.532		1.14	0.41 to 3.15	0.796
Cooking everyday		0.88	0.59 to 1.31	0.534		0.68	0.34 to 1.39	0.292
Brushing		0.82	0.54 to 1.26	0.371		0.62	0.33 to 1.15	0.127
Having gone to preschool		0.36	0.13 to 1.01	0.052†		1.50	0.25 to 8.98	0.657
Interaction with children	−0.65		−1.46 to 0.16	0.114	−0.73		−1.93 to 0.46	0.227
Having any maltreatment		0.87	0.61 to 1.22	0.414		0.69	0.40 to 1.18	0.176
Physical abuse		0.99	0.63 to 1.57	0.965		1.20	0.60 to 2.38	0.602
Psychological abuse		0.98	0.69 to 1.40	0.912		0.88	0.50 to 1.55	0.668
Neglect		0.77	0.42 to 1.42	0.403		0.91	0.39 to 2.14	0.827
Material components								
Having any deprivation		1.29	0.87 to 1.93	0.207		1.47	0.76 to 2.83	0.253
Material deprivation		1.47	0.95 to 2.27	0.081†		1.67	0.81 to 3.41	0.162
Payment difficulties		0.69	0.34 to 1.37	0.287		0.50	0.17 to 1.46	0.206

Bold signified $p < 0.05$ and †signified $p < 0.10$

OR: odds ratio

2.30) and prosocial behavior (mean scores were 6.97 and 6.66). As for risk factors, we observed the same tendency among three groups, except for child-parent interaction scores in familial components and payment difficulties scores in material components.

Supplementary Table 3 shows the results of propensity-score matching with the possible confounders and predictors of public assistance and child mental health. Caregivers who received public assistance were more likely to be single and

Table 2 Association between public assistance and child mental health among low-income households before and after matching

Variables		Before matching			After matching		
		B	95% CI	*p*-value	B	95% CI	*p*-value
SDQ	Emotional symptoms	0.17	−0.19 to 0.52	0.355	−0.02	−0.58 to 0.55	0.947
	Conduct problems	0.10	−0.25 to 0.44	0.572	−0.02	−0.60 to 0.56	0.948
	Hyperactivity/inattention	0.01	−0.41 to 0.43	0.966	−0.35	−1.09 to 0.39	0.346
	Peer relationship problems	0.02	0.28 to 0.31	0.920	0.29	−0.15 to 0.72	0.191
	Total difficulties score	0.30	0.72 to 1.33	0.562	−0.10	−1.73 to 1.52	0.898
	Prosocial behavior	0.31	−0.05 to 0.67	0.091†	0.18	− 0.41 to 0.78	0.548
CRCS	Total score	0.75	−2.20 to 3.69	0.620	0.80	−4.06 to 5.67	0.744
		OR	95% CI	*p*-value	OR	95% CI	*p*-value
School refusal		2.02	0.98 to 4.19	0.058†	4.00	0.85 to 18.84	0.080†

SDQ: Strength and difficulties Questionnaire, CRCS: Children's Resilient Coping Scale, OR: odds ratio
†Signified $p < 0.10$

smokers, have more psychiatric disorders, less educational attainment, and reported higher standardized household income as compared to caregivers who did not receive public assistance, yet were earning below the assigned low-income threshold. After propensity-score matching, the difference in the abovementioned characteristics between recipients and non-recipients were not significant.

Table 1 shows the results of regression analysis on the association between public assistance status and child living conditions before and after propensity-score matching. Although the results showed that households receiving public assistance reported less social capital (B = −0.73, 95% confidence interval (CI) −1.23 to −0.22), the association became insignificant after matching (B = −0.17, 95% CI −0.94 to 0.60). None of the other variables showed significant differences.

Table 2, presenting results of regression on child mental health, shows that children in households receiving public assistance were at higher risk of school refusal. That is, those children were 4 times more likely to refuse to go to school (OR = 4.00, 95% CI 0.85 to 18.84) compared to children living in low-income households but not receiving public assistance, although at the significance level of < 0.08. Scores of SDQ and CRCS did not show a significant difference after propensity-score matching.

Discussion

This study aimed to describe the mental health status among children in households receiving public assistance, and to elucidate the effect of public assistance on child mental health and lifestyle in terms of social, familial, and material components. We found that children living in low-income households, whether or not they received public assistance, were significantly more likely to show mental health problems

and to have less social capital, less family interaction, and material deprivation compared to children in middle-income households. With propensity-score matching, we elucidated that public assistance does little to remedy the effect of low-income on child mental health. That is, children in households receiving public assistance were 4 times more likely to refuse to go to school although at the significance level of < 0.08.

As in other countries, Japan requires applicants to work in order to receive public assistance. Although work requirements are intended to help recipients become independent, their effectiveness is dubious, especially for children, because they may reduce the time caregivers spend with children [18]. The previous studies showed that policy changes to include strict work requirements had a negative impact on child health, measured by subjective child health status [47], number of hospitalizations [48] or length of hospital stay [49], and prevalence of maternal depression [47, 50]. Further, mothers reported feeling shame and pressure to find a job even if they lacked education or a solid work history, leading to a loss of self-esteem and self-worth [51]. In addition to the work requirements, Japanese public assistance does not allow recipients to have any form of material or financial assets such as cars or insurance. This condition may cause limited investment in the children, social exclusion, and mental stress, resulting in unhealthy child development [52]. Our findings are not consistent with those previous studies, possibly due to strict matching of parental mental health, psychiatric symptoms, and education. In other words, children with similar backgrounds are suffering from a lack of material, opportunities, family processes and social engagement regardless of public assistance status.

Deprivation of materials or opportunities may cause substantial damage to child development leading to poor cognitive skills [53] and a sense of inferiority. Caregivers receiving public assistance often spent their money on daily necessities, rather than on extracurricular activities [22]. Inability to support the latter might broaden the gap in cognitive and non-cognitive skills, leading to school absence [42, 54]. Thus, providing in-kind benefits is also an important social policy for low-income households. In the United States, Head Start, Healthy Start, and the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) are well known and provide material support services, including early childhood education, developmental and health screenings, and food services, focusing mainly on supporting pregnant women and preschool-aged children living in poverty. Most previous studies have shown that material support makes a significant improvement in lifestyle and health outcomes for both pregnant women and children [55, 56]. In terms of deprivation, this study showed no significantly different experiences of material deprivation and payment difficulties between public assistance recipients and non-recipients; this was discordant with the previous study [22]. Yet, the quantity and quality of materials such as books might differ. To elucidate how public assistance affects children's school attendance, more thorough studies need to investigate other factors including school factors and the views of children, which were not captured here.

Other researchers have shown that public assistance status can be transgenerational [24], but no study has specified how this status is passed from parents to children. This study presented the hypothesis that school absenteeism could be a

possible mediator for future adversities including becoming public assistance recipients for children in the households receiving public assistance. School refusal is a significant risk factor for future low educational attainment, in addition to teenage pregnancy, mental illness, substance abuse, economic deprivation, and marital and social problems [58]. To prevent children in families that receive public assistance from becoming public assistance recipients in the future and experiencing physical, psychiatric and social problems, it is critical to intervene early, at least at school age (6 years old). Social assistance policies might help those in need [15, 59–61], although their impact on mental health has not yet been proved [61] nor even denied in our study. There remains much room for improvement to support the mental health of people living in poverty.

One possible approach is to intervene in the low take-up rates [24–28]. The distinction between recipients and unsuccessful applicants for public assistance potentially creates discrimination since people may think that recipients rely solely on the social security system without making any effort to find work [31] given that the most people can live without public assistance. In reality, along with negative stereotypes of public assistance recipients and a perception that recipients are cheating the system [20, 31], strong social stigma remains, and therefore welfare recipients feel embarrassed or try to hide their use of public assistance [20, 30, 62]. Our results indicated that low-income households with similar backgrounds are in danger of lacking the necessities, which justifies an increase in coverage and amount of assured income.

Another area of concern is lack of direct interventions targeted to children. In the current system in Japan, case workers are required to visit a recipient's home and to help them to live without public assistance. Even if case workers notice that a child is having problems, they may believe the issue is beyond the scope of their roles. Due to the limited time they have with clients their focus is mainly on parents, and they may believe the problems are too difficult to solve by themselves [63]. It is important that case workers be empowered to connect vulnerable children to professional services as soon as possible. Also, it might be more effective to look for alternative strategies, such as enhancing the quality of home visits to maximize the limited time of social workers [63], by making the lists of parent and child life and health factors that should be checked during the visit.

The current study has several limitations. First, we derived data from self-reported questionnaires, that may contain information bias. Although we divided the sample population into three groups, the categorization may not be accurate due to misreported income. Also, caregiver-reported information does not reflect the child's point of view or experience. Second, we excluded data where information on household income and public assistance status was missing. Because excluded households may be those living in severe poverty, the results may underestimate the effect of public assistance. Third, there was no information on the duration and amount of public assistance. Considering that the public assistance status changes month by month, this information has a potential impact on effect size. Also, we defined children of public assistance recipients as those in households that have received or are receiving public assistance. Because we did not differentiate between households that had received and were receiving public assistance, this might bias estimates.

Fourth, we used cross-sectional data. Despite using propensity-score matching, we are not able to directly infer causality. Future studies must overcome these limitations to elucidate more accurately the effects of public assistance and its path.

Despite the limitations, to our knowledge this is the first study to explore the mental health and actual lifestyles of children in households receiving public assistance compared to non-recipients living under the low-income, and middle-income. By using propensity-score matching, this study examines the empirical effect of public assistance on children. Our findings suggest that public assistance might elevate the risk of school refusal by four times. To tackle these problems, government should reconsider the process for approving application of public assistance to increase the take-up rates. It is important to assure that case workers in charge of each household take care of children to connect necessary professionals and to check children's health status. To realize these changes, Japan must address the lack of resources in public welfare.

Because public assistance is implemented all over the world and child poverty is becoming a critical social problem, our study may suggest some directions for future policy in the other countries. Future studies should examine why children in households receiving public assistance refuse to go to school, and how we can improve the current policy to combat child mental problems.

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