

ORIGINAL ARTICLE

The relationship between having a usual source of primary care and COVID-19 parental vaccine hesitancy: A nationwide survey among Japanese mothers

Kenya Ie MD, PhD, MPH^{1,2,3} | Mio Kushibuchi MD^{1,2} | Tomoya Tsuchida MD, PhD¹ | Iori Motohashi MD, MPH^{1,2} | Masanori Hirose MD, PhD¹ | Steven M. Albert PhD³ | Miyako Kimura PhD, MPH⁴

¹Department of General Internal Medicine, St. Marianna University School of Medicine, Kawasaki-shi, Japan

²Department of General Internal Medicine, Kawasaki Municipal Tama Hospital, Kawasaki-shi, Japan

³Department of Behavioral and Community Health Sciences, University of Pittsburgh Graduate School of Public Health, Pittsburgh, Pennsylvania, USA

⁴Department of Preventive Medicine, St Marianna University School of Medicine, Kawasaki-shi, Japan

Correspondence

Kenya Ie, Department of General Internal Medicine, Kawasaki Municipal Tama Hospital, Shukugawara 1-30-37, Tama-ku, Kawasaki-shi, Kanagawa, Japan.
Email: iekenya0321@gmail.com

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Abstract

Background: Studies have shown that a usual source of care increases the receipt of child preventive care; however, the relationship between having a usual source of primary care and COVID-19 parental vaccine hesitancy has not been fully investigated. The aims of this study were to elucidate the characteristics of mothers with a primary care physician, and to explore the relationship between having a usual source of primary care and COVID-19 parental vaccine hesitancy among mothers in Japan.

Method: This cross-sectional survey-based study included 4516 mothers. Using a chi-square test, the characteristics of mothers with and without a primary care physician were compared. Poisson regression was applied to evaluate the relationship between having a usual source of primary care and parental COVID-19 vaccine hesitancy.

Results: Mothers with a usual source of primary care had higher education, lower mental distress, had younger children, and were less hesitant toward the child's COVID-19 vaccination. Vaccine hesitancy was observed in 39.8% of mothers with a usual source of primary care and 45.5% of those without. Poisson regression analysis showed that mothers with a primary care physician were less vaccine-hesitant (IRR=0.90, 95% CI=0.84–0.96) after adjusting for potential confounders.

Conclusion: This study suggested that having a usual source of primary care may contribute to lower parental COVID-19 vaccine hesitancy. However, the high vaccine hesitancy rate, even among mothers with a usual source of primary care, warrants healthcare providers to be equipped to help parents make informed decisions about vaccination through the continuity of care.

KEYWORDS

child vaccination, COVID-19 vaccine, primary care physician, usual source of primary care, vaccine hesitancy

Kenya Ie and Mio Kushibuchi contributed equally to this study.

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1 | INTRODUCTION

A usual source of care refers to a place where one usually goes when he or she is sick and is said to be associated with continuity of care as well as receipt of preventive services.^{1,2} Especially in the care of children, a usual source of primary care may address the unmet needs of children. A previous study conducted in the United States reported that children with no usual source of care reported 5.3 times higher odds of having unmet medical needs.³ Other studies have indicated that not only the child's usual source of care but also their parents' affects children's receipt of health care services.⁴ In Japan, children under 9 years of age have more frequent physician visits compared to teenagers⁵; thus, these young children and their parents are the populations with potentially higher exposure to primary care.⁶ Although Japan has a free-access medical system where patients can access any medical institution at any time, the Japanese government has recommended that citizens should have a primary care physician.⁷ As a reflection of this, the younger generation's perceived need to have a primary care physician has increased in recent years.⁸

Vaccine hesitancy is a complex decision-making process determined by multiple factors. Previous studies have applied different definitions for vaccine hesitancy. For example, the SAGE working group on vaccine hesitancy defined vaccine hesitancy as a delay in vaccine acceptance or vaccination refusal despite the availability of vaccination services.⁹ Several studies examined factors associated with vaccine hesitancy and have shown that healthcare providers are the most important promoters of vaccine acceptance.^{10,11} These results have been reproduced internationally. A study from Japan indicated that among the older population, having a primary care physician was associated with receiving pneumococcal vaccination.¹² Likewise, as much as 47% of initially hesitant parents subsequently decided to get vaccinated after strong recommendations by their healthcare providers.¹³

Socioeconomic status is also closely interrelated with vaccine hesitancy. Studies from the United States, United Kingdom, Canada, and India have indicated that mothers' low education attainment was shown to be a strong predictor of incomplete child vaccination and higher parental vaccine hesitancy.^{14,15} Studies from Malaysia and Taiwan indicated that unemployed mothers tended to be more vaccine-hesitant.^{16,17} Regarding COVID-19 parental vaccine hesitancy, parents of publicly insured children,¹⁸ lower-income parents,¹⁸ and those with lower satisfaction with social relationships¹⁹ had higher parental COVID-19 vaccine hesitancy.

In Japan, similar to many other countries, there was a history of controversial public opinion regarding vaccination. Although Japan has almost 100% coverage rates of recommended routine vaccines, the coverage rate of some vaccines such as the Human Papillomavirus (HPV) is lower than in other Organization for Economic Co-operation and Development countries.²⁰ Regarding COVID-19 vaccination in Japan as of February 2023, only 19.0% of children aged 5–11 had received their second dose.²¹

The positive effects of having a usual source of primary care on child preventive care have been shown by previous studies^{3,4}; however, characteristics of mothers with usual source of primary care in Japan have not been sufficiently studied. Additionally, to our knowledge, no studies have examined the relationship between having a usual source of primary care and COVID-19 parental vaccine hesitancy in Japan. This study aimed to elucidate the characteristics of mothers with a primary care physician, and to explore the relationship between having a usual source of primary care and COVID-19 parental vaccine hesitancy among mothers in Japan.

2 | MATERIALS AND METHODS

2.1 | Study participants

This was a cross-sectional study using data from an online survey that was conducted between June to July 2021.²² To reduce negative support and construct a supportive environment for mothers with young children in Japan, Kimura has implemented this longitudinal study since 2020.²²⁻²⁶ It was hosted by a survey company that had a nationwide research panel of 4.7 million people and included 4700 mothers with children ranging from infancy to the first grade of elementary school. Respondents were recruited from all 47 prefectures in Japan (100 respondents per prefecture). Questions regarding childcare were asked about these mothers' youngest child. Of the sample, 184 participants answered about their second-to-youngest child and were consequently excluded from the analysis. A final sample of 4516 participants was used for analysis. Consent information was provided at the beginning of the web-based survey, and consent was obtained by submission of the completed survey. The research protocol was approved by the Institutional Review Board of St. Marianna University School of Medicine (approval number 4648). This study was supported by the Japan Society for the Promotion of Science, KAKENHI, Grant Number JP 17H02612, JP22H03429, Health Science Center, General Foundation, and Japan Health Academy.

2.2 | Vaccine hesitancy

COVID-19 parental vaccine hesitancy was measured using a single-item question; "Do you intend to have your child have the COVID-19 vaccine when your child reaches the recommended age?" Participants were asked to choose from "agree," "somewhat agree," "somewhat disagree," and "disagree." "Somewhat disagree" and "disagree" were classified as vaccine-hesitant. This question was applied and modified based on previous studies.^{18,19} Since the COVID-19 vaccine for children aged 5–11 years old was not available at the time of this survey, it was necessary to ask about the intention of vaccination for an anticipated vaccine opportunity as in these previous studies.^{18,19} In addition, the Parent Attitudes about

Childhood Vaccines questionnaire,²⁷ a widely applied scale for vaccine hesitancy, was not available because there were no validated Japanese version.

2.3 | Usual source of primary care

A participant was deemed to have a usual source of primary care if she answered yes to the following question: “Do you or your children have a primary care physician?”. Based on the definition of the Japan Medical Association,⁶ the primary care physician in this study was described as “a reliable and accessible doctor from whom advice could be obtained regarding anything related to health and who refers you to a specialist if needed”.

2.4 | Participants' characteristics

All participants' information related to age, household income, marital status, education, employment status, and mental distress were obtained. Age was stratified into three groups: 20–29 years old; 30–39 years old; and 40 years or older. Characteristics related to one's child were the child's age, sex, and the number of children. The child's age was divided into 0–1 year old, 2–3 years old, and 4 years or older. The number of children was either one, two, or more than two. Annual household income was grouped as “low income,” which was below JPY4 million (USD 30,441 as of February 9th, 2023), “middle,” which was JPY4 million or more to below JPY6 million (USD 45,662 as of February 9th, 2023), “high,” which was JPY6 million or more, and “do not want to answer.” Marital status was either married/has a partner, or widowed/divorced/never married. Education was classified into three groups: “high,” which was a university graduate or higher; “middle,” which was a junior college or vocational school; and “low,” which was junior high or high school. Employment status was either currently employed or not employed. Mental distress was measured by the Kessler Psychological Distress Scale (K6), a self-reported screening tool measuring the frequency of symptoms of nonspecific psychological distress,²⁸ and is a validated screening tool to detect anxiety and mood disorders.²⁹ The Japanese version of the K6 is validated elsewhere.³⁰ For this study, a score of 10 points or higher was classified as having mental distress, as endorsed by the Japanese comprehensive survey of living conditions³⁰ and in the previous study by Kimura.²⁵

2.5 | Statistical analysis

Basic demographics among the overall population and subgroups with and without a usual source of primary care were described using percentages and tested for statistical significance by the chi-square test. Poisson regression analysis was performed to obtain the incidence-rate ratio (IRR) and 95% confidence intervals (CIs) using vaccine hesitancy as the dependent variable. After crude IRR was

calculated, adjusted IRR was calculated with having a usual source of primary care as the main explanatory variable, and the participant's age, marital status, education, employment status, household income, mental distress, child's age, sex, and the number of children as covariates. A *p*-value less than 0.05 was defined as statistically significant. All statistical analyses were performed using the STATA version 15 software (Stata Corporation).

3 | RESULTS

The characteristics of the participants are shown in Table 1. Of the sample, 41.2% (*N* = 1860) reported having a usual source of primary care. The participants' mean age was 35.2 years (SD ±5.5), and the child's mean age was 2.8 years (SD ±2.1). The age distribution did not significantly differ between those who had a usual source of primary care and those who did not. Mothers with a usual source of primary care had higher educational attainment compared to those without. Overall, 24.4% of the participants reported having mental distress, and mothers with a usual source of primary care had lower mental distress than those who reported not having a primary care physician (18.4% and 28.5%, respectively). Regarding child factors, mothers with a primary care physician had younger children, and most notably, were less hesitant toward the child's COVID-19 vaccination: The proportion of mothers who responded as “vaccine-hesitant” was 39.8% among those with a usual source of primary care and 45.5% among those who did not. Table 2 shows the crude and adjusted IRR for parental COVID-19 vaccine hesitancy. In the crude model, having a usual source of primary care, lower age, being married or having a partner, having higher education, being employed, and having lower mental distress were associated with lower vaccine hesitancy. After adjustment for covariates, having a usual source of primary care was significantly associated with lower vaccine hesitancy (IRR = 0.90, 95% CI = 0.84–0.96, *p* = 0.002). Other factors associated with lower vaccine hesitancy after adjustment for potential confounders were being 20–29 years old (compared to those 40 years or older), having high education level, being employed, having low mental distress, and having a younger child.

4 | DISCUSSION

This was the first study to our knowledge to show that mothers with a usual source of primary care had lower parental COVID-19 vaccine hesitancy. An ecological study from the United States showed that the number of per capita primary care physicians was associated with COVID-19 vaccine uptake.³¹ Likewise, a cross-sectional study conducted in Japan demonstrated that having physicians and nurses as information sources were associated with COVID-19 vaccination willingness.³² However, this previous study only refers to “physicians” as an information source, including experts' opinions available online, not as an accessible, accountable usual source of primary care. The present study has novelty in how it revealed that

TABLE 1 Characteristics of participants and those with and without a usual source of primary care.

	Total (N = 4516)	No usual source of primary care (N = 2656)	Have usual source of primary care (N = 1860)	p-value
Characteristics				
Participants' age				
20–29 years old	1039 (23.0%)	628 (23.6%)	411 (22.1%)	0.052
30–39 years old	2785 (61.7%)	1600 (60.2%)	1185 (63.7%)	
40+ years old	692 (15.3%)	428 (16.1%)	264 (14.2%)	
Household income				
6 million yen or more	1387 (30.7%)	791 (29.8%)	596 (32.0%)	0.217
4 million yen or more to below 6 million yen	1186 (26.3%)	698 (26.3%)	488 (26.2%)	
Below 4 million yen	1075 (23.8%)	633 (23.8%)	442 (23.8%)	
Do not want to answer	868 (19.2%)	534 (20.1%)	334 (18.0%)	
Marital status				
Widowed/divorced/never married	265 (5.9%)	176 (6.6%)	89 (4.8%)	0.010*
Married/has a partner	4251 (94.1%)	2480 (93.4%)	1771 (95.2%)	
Education level				
High	1627 (36.0%)	918 (34.6%)	709 (38.1%)	0.011*
Middle	1527 (33.8%)	896 (33.7%)	631 (33.9%)	
Low	1362 (30.2%)	842 (31.7%)	520 (28.0%)	
Employment status				
Not employed	1826 (40.4%)	1071 (40.3%)	755 (40.6%)	0.857
Employed	2690 (59.6%)	1585 (59.7%)	1105 (59.4%)	
Mental distress (K6)				
9 points or lower	3415 (75.6%)	1898 (71.5%)	1517 (81.6%)	<0.001*
10 points or higher	1101 (24.4%)	758 (28.5%)	343 (18.4%)	
Child's demographics				
Child's sex				
Boy	2308 (51.1%)	1350 (50.8%)	958 (51.5%)	0.654
Girl	2208 (48.9%)	1306 (49.2%)	902 (48.5%)	
Youngest child's age				
0–1 year old	1584 (35.1%)	849 (32.0%)	735 (39.5%)	<0.001*
2–3 years old	1302 (28.8%)	774 (29.1%)	528 (28.4%)	
4+ years old	1630 (36.1%)	1033 (38.9%)	597 (32.1%)	
Number of children				
1	1964 (43.5%)	1177 (44.3%)	787 (42.3%)	0.394
2	1796 (39.8%)	1044 (39.3%)	752 (40.4%)	
3 or more	756 (16.7%)	435 (16.4%)	321 (17.3%)	
COVID-19 vaccine				
Not hesitant	2573 (57.0%)	1453 (54.7%)	1120 (60.2%)	<0.001*
Hesitant	1943 (43.0%)	1203 (45.3%)	740 (39.8%)	

Note: COVID-19 vaccine hesitancy was measured by the question, "Do you want to have your child vaccinated for COVID-19 when the child reaches recommended age?" Answers were "agree," "somewhat agree," "somewhat disagree," and "disagree." "Disagree" and "somewhat disagree" were classified as vaccine-hesitant.

Abbreviation: K6, Kessler Psychological Distress scale.

*p-value under 0.05.

TABLE 2 Crude and adjusted incidence-rate ratio (IRR) for parental COVID-19 vaccine hesitancy.

	COVID-19 vaccine hesitancy					
	Crude Poisson regression model			Adjusted Poisson regression model		
	IRR	95% CI	p-value	IRR	95% CI	p-value
Usual source of primary care						
Do not have	Ref			Ref		
Have	0.88	0.82–0.94	<0.001*	0.9	0.84–0.96	0.002*
Mother's age						
20–29 years old	Ref			Ref		
30–39 years old	1.00	0.92–1.09	0.996	1.04	0.95–1.13	0.390
40+ years old	1.12	1.01–1.24	0.039*	1.18	1.04–1.33	0.008*
Household income						
6 million yen or more	Ref			Ref		
4 million yen or more to below 6 million yen	1.04	0.95–1.14	0.425	1.00	0.91–1.10	0.992
Below 4 million yen	1.08	0.99–1.18	0.099	1.01	0.92–1.12	0.796
Do not want to answer	1.04	0.94–1.15	0.464	0.99	0.89–1.09	0.777
Marital status						
Widowed/divorced/never married	Ref			Ref		
Married/has a partner	0.46	0.40–0.52	<0.001*	0.97	0.84–1.12	0.657
Education level						
High	Ref			Ref		
Middle	1.11	1.02–1.21	0.012*	1.09	1.01–1.19	0.037*
Low	1.15	1.06–1.25	<0.001*	1.11	1.02–1.21	0.018*
Employment status						
Not employed	Ref			Ref		
Employed	0.45	0.43–0.47	<0.001*	0.93	0.86–0.99	0.03*
Mental distress (K6)						
9 points or lower	Ref			Ref		
10 points or higher	1.13	1.05–1.22	0.001*	1.10	1.02–1.19	0.01*
Child sex						
Boy	Ref			Ref		
Girl	0.98	0.92–1.05	0.589	0.98	0.92–1.05	0.584
Youngest child's age						
0–1 year old	Ref			Ref		
2–3 years old	1.01	0.92–1.10	0.900	1.01	0.92–1.01	0.878
4+ years old	1.07	0.99–1.16	0.081	1.09	1.00–1.20	0.048*
Number of children						
1	Ref			Ref		
2	1.03	0.96–1.11	0.375	1.04	0.97–1.12	0.293
3 or more	1.05	0.95–1.15	0.324	1.06	0.96–1.17	0.220

Abbreviations: IRR, incidence-rate ratio; K6, Kessler Psychological Distress scale.

*p-value under 0.05.

having a primary care physician as a usual source of primary care was associated with lower parental COVID-19 vaccine hesitancy among mothers in Japan.

Demographic factors associated with having a usual source of primary care, compared to those without, were being married or

having a partner, having higher education, having lower mental distress, and having a younger child. In previous studies among the community-dwelling adult population of the United States, being married and having higher education were associated with having a usual source of care.^{33–35} Regarding the association between the

child's age and having a primary care physician, a survey from Japan reported that younger children had more frequent physician visits compared to older children, which concurs with the present study's results.⁵ Another study reported that individuals with higher psychologic distress tended not to receive recommended preventive care, which may be relevant to the present study's results stating that participants with lower mental distress were more likely to have a primary care physician.³⁶ As shown, many of the identified factors associated with having a usual source of primary care were consistent with those reported previously.³³⁻³⁶ Future research and policy interventions should focus on improving access to primary care for those without a usual source of primary care.

Our results revealed that mothers with a usual source of primary care, compared to those without a primary care physician, were less hesitant to have their child vaccinated for COVID-19 after adjusting for other covariates. Previous studies have demonstrated that healthcare continuity, embodied by a usual source of care, may play a role in enhancing parental vaccination willingness.³⁷ Continuity is defined as care cohesion over a longitudinal time course and care focused on patients' context and medical needs.³⁸ A lower level of continuity of care have been reported to be associated with lower flu vaccine uptake among the underserved older population³⁹ and children.³⁷ Similarly, in Japan, better care longitudinality, measured by the Japanese version of the Primary Care Assessment Tool, was associated with higher pneumococcal vaccine uptake.⁴⁰ In addition to healthcare continuity, physicians' interpersonal skills may be crucial for parental vaccine uptake. Interpersonal skills are comprised of understanding, empathy, and relational versatility, and are important in discovering emotional mutuality to support the challenge of agreeing on a treatment.⁴¹ According to a Japanese study of older patients, having a family physician and a high rating for physicians' listening attitude were positively associated with higher uptake of pneumococcal and influenza vaccinations.¹² These studies, together with our results, imply that the continuity of care provided by primary care physicians with good interpersonal skills may influence parents' vaccine acceptance.

In relation to the physician's interpersonal skills, another noteworthy aspect of this study is the relatively high vaccine hesitancy rate even among mothers with a usual source of primary care. This may reflect parents' potential concerns about the COVID-19 vaccine, which has yet to be applied long enough for the pediatric population. This warrants primary care providers to be fully equipped to help parents make informed decisions about vaccination through the continuity of care.

Regarding other covariates and vaccine hesitancy in the current study, younger mothers tended to be less vaccine-hesitant, which contradicts previous studies reporting that younger mothers were more vaccine-hesitant toward recommended routine vaccines.^{14,42} Further in-depth investigation of mothers' perceptions of vaccination and the difference in healthcare-seeking behavior among each age group may be required to explain these inconsistent results. In addition to mother's age, this study showed that mothers of younger children were less vaccine-hesitant, but the child's age obtained in

this study is merely the first child's age. Thus, it is difficult to draw conclusions regarding a child's age and hesitancy tendencies. Other than these age-related factors, our results concur with previous studies regarding how higher education attainment and employment were associated with lower vaccine hesitancy.¹⁴⁻¹⁷ These factors, educational history and employment, were also associated with having a family physician; thus, the presence of a usual source of primary care may be a confounding factor. However, even after adjusting for having a usual source of primary care, educational history and employment remained significant predictors of a lower vaccine hesitancy.

This study has several limitations. First, covariates were only those measured in the survey; consequently, it could not account for possible unmeasured covariates such as the oldest child's age and health literacy. However, this study included most confounders included in previous studies, such as socioeconomic status and mothers' mental health status. Second, whether the primary care physician was the participant's or the child's physician could not be determined. Therefore, it was not possible to distinguish whether the observed effect on vaccine hesitancy was due to the presence of pediatric care or to more general access to regular care. However, previous studies have indicated that both mother's and child's usual source of care contributes to the child's preventive care use³; thus, it can be assumed that it is plausible to refer to both the mother's and child's primary care physician with the same term. Lastly, the assumption can be made that there was a selection bias regarding internet literacy because this was an online survey. Consequently, the results may not be generalizable to the general population.

In conclusion, this nationwide large-sample study suggested that having a usual source of primary care may contribute to lower parental COVID-19 vaccine hesitancy even after controlling for potential confounders. Thus, efforts to improve access to primary care may contribute to improve COVID-19 vaccine uptake. Another noteworthy aspect of this study is that the vaccine hesitancy rate was relatively high even in mothers with a usual source of primary care. This warrants primary care physicians to be fully equipped to help parents make informed decisions about vaccination through the continuity of care.

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CONFLICT OF INTEREST STATEMENT

The authors have stated explicitly that there are no conflicts of interest in connection with this article.

ETHICAL APPROVAL STATEMENT

The authors confirm that the ethical policies of the journal based on the core practices of the Committee on Publication Ethics (COPE), as noted on the journal's author guidelines page, have been adhered.

PATIENT CONSENT STATEMENT

Consent information was provided at the beginning of the web-based survey, and consent was obtained by submission of the completed survey.

CLINICAL TRIAL REGISTRATION

Not applicable.

ORCID

Kenya Ie  <https://orcid.org/0000-0002-1387-0588>

Mio Kushibuchi  <https://orcid.org/0000-0003-1651-2177>

Tomoya Tsuchida  <https://orcid.org/0000-0002-8517-3941>

REFERENCES

- Kim MY, Kim JH, Choi IK, Hwang IH, Kim SY. Effects of having usual source of care on preventive services and chronic disease control: a systematic review. *Korean J Fam Med.* 2012;33(6):336–45.
- Aoki T, Fujinuma Y, Matsushima M. Usual source of primary care and preventive care measures in the COVID-19 pandemic: a nationwide cross-sectional study in Japan. *BMJ Open.* 2022;12:e057418.
- Hoilette LK, Clark SJ, Gebremariam A, Davis MM. Usual source of care and unmet need among vulnerable children: 1998-2006. *Pediatrics.* 2009;123(2):e214–9.
- DeVoe JE, Tillotson CJ, Wallace LS, Angier H, Carlson MJ, Gold R. Parent and child usual source of care and children's receipt of health care services. *Ann Fam Med.* 2011;9(6):504–13.
- Ministry of Health Labour and Welfare. Abstract of patient survey, 2020 [Internet]. Available from: <https://www.mhlw.go.jp/toukei/saikin/hw/kanja/20/index.html>
- Ministry of Health Labour and Welfare. What is a primary care physician? [Internet]. [cited 2023 Mar 10]. Available from: <https://kakarikata.mhlw.go.jp/kakaritsuke/motou.html>
- Ministry of Health Labour and Welfare. Regarding assessment on function of primary care physicians, and role of paramedics in outpatient care [Internet]. 2020. [cited 2023 Mar 10]. Available from: <https://www.mhlw.go.jp/content/10800000/000607891.pdf>
- Japan Medical Association. Report on the seventh opinion survey regarding medical care in Japan [Internet]. [cited 2023 Mar 10]. Available from: https://www.med.or.jp/dl-med/teireikaiken/20201007_4.pdf
- MacDonald NE, SAGE Working Group on Vaccine Hesitancy. Vaccine hesitancy: definition, scope and determinants. *Vaccine.* 2015;33(34):4161–4.
- Jones AM, Omer SB, Bednarczyk RA, Halsey NA, Moulton LH, Salmon DA. Parents' source of vaccine information and impact on vaccine attitudes, beliefs, and nonmedical exemptions. *Adv Prev Med.* 2012;2012:932741.
- Kestenbaum LA, Feemster KA. Identifying and addressing vaccine hesitancy. *Pediatr Ann.* 2015;44(4):e71–5.
- Sato K, Kondo N, Murata C, Shobugawa Y, Saito K, Kondo K. Association of pneumococcal and influenza vaccination with patient-physician communication in older adults: a nationwide cross-sectional study from the JAGES 2016. *J Epidemiol.* 2022;32(9):401–7.
- Opel DJ, Heritage J, Taylor JA, Mangione-Smith R, Salas HS, DeVere V, et al. The architecture of provider-parent vaccine discussions at health supervision visits. *Pediatrics.* 2013;132(6):1037–46.
- Reuben R, Aitken D, Freedman JL, Einstein G. Mistrust of the medical profession and higher disgust sensitivity predict parental vaccine hesitancy. *PLoS One.* 2020;15(9):e0237755.
- Vikram K, Vanneman R, Desai S. Linkages between maternal education and childhood immunization in India. *Soc Sci Med.* 2012;75(2):331–9.
- Mohd Azizi FS, Kew Y, Moy FM. Vaccine hesitancy among parents in a multi-ethnic country, Malaysia. *Vaccine.* 2017;35(22):2955–61.
- Chen MF, Wang RH, Schneider JK, Tsai CT, Dah-Shyong Jiang D, Hung MN, et al. Using the health belief model to understand caregiver factors influencing childhood influenza vaccinations. *J Community Health Nurs.* 2011;28(1):29–40.
- Alfieri NL, Kusma JD, Heard-Garris N, Davis MM, Golbeck E, Barrera L, et al. Parental COVID-19 vaccine hesitancy for children: vulnerability in an urban hotspot. *BMC Public Health.* 2021;21(1):1662.
- Horiuchi S, Sakamoto H, Abe SK, Shinohara R, Kushima M, Otawa S, et al. Factors of parental COVID-19 vaccine hesitancy: a cross sectional study in Japan. *PLoS One.* 2021;16(12):e0261121.
- Gordon A, Reich MR. The puzzle of vaccine hesitancy in Japan. *J Jpn Stud.* 2021;47(2):411–36.
- Prime Minister's Office of Japan. COVID-19 vaccine immunization results by age group [Internet]. [cited 2023 Mar 10]. Available from: https://www.kantei.go.jp/jp/content/nenreikaikyubetsu-vaccination_data.pdf
- Kimura M. Negative social support experiences and their impacts on mothers of infants/preschoolers. [cited 2023 Mar 10]. Final Research Report of Grant-in-Aid for Scientific Research (B) 2021. Available from: <https://kaken.nii.ac.jp/ja/file/KAKENHI-PROJECT-17H02612/17H02612seika.pdf>
- Kimura M, Kimura K, Ojima T. Relationships between changes due to COVID-19 pandemic and the depressive and anxiety symptoms among mothers of infants and/or preschoolers: a prospective follow-up study from pre-COVID-19 Japan. *BMJ Open.* 2021;11(2):e044826.
- Kimura M, Ojima T. The reliability and validity of the scale for the capacity to receive support: In the cases of mothers of babies and preschoolers. *Bull of Soc Med.* 2021;38(1):41q–53.
- Kimura M, Ide K, Ojima T. Mental distress during the COVID-19 pandemic among mothers of young children and the related factors: a focus on their difficulties in raising their child, concerns about their child's development, social support, and capacity to receive support. *Nihon Koshu Eisei Zasshi.* 2022;69(4):273–83.
- Kimura M, Ide K, Kimura K, Ojima T. Predictors of happiness during the COVID-19 pandemic in mothers of infants and/or preschoolers: a pre-COVID-19 comparative study in Japan. *Environ Health Prev Med.* 2022;27(14):1–10.
- Opel DJ, Mangione-Smith R, Taylor JA, Korfiatis C, Wiese C, Catz S, et al. Development of a survey to identify vaccine-hesitant parents: the parent attitudes about childhood vaccines survey. *Hum Vaccin.* 2011;7(4):419–25.
- Kessler RC, Andrews G, Colpe LC, Hiripi E, Mroczek DK, Normand SLT, et al. Short screening scales to monitor population prevalences and trends in non-specific psychological distress. *Psychol Med.* 2002;32(6):959–76.
- Kessler RC, Barker PR, Colpe LJ, Epstein JF, Gfroerer JC, Hiripi E, et al. Screening for serious mental illness in the general population. *Arch Gen Psychiatry.* 2003;60:184–9.
- Furukawa TA, Kawakami N, Saitoh M, Ono Y, Nakane Y, Nakamura Y, et al. The performance of the Japanese version of the K6 and K10 in the world mental health survey Japan. *Int J Methods Psychiatr Res.* 2008;17(3):152–8.
- Lo CH, Chiu L, Qian A, Khan MZ, Alhassan HA, Duval AJ, et al. Association of primary care physicians per capita with COVID-19 vaccination rates among US counties. *JAMA Netw Open.* 2022;5(2):e2147920.
- Nomura S, Eguchi A, Yoneoka D, Kawashima T, Tanoue Y, Murakami M, et al. Reasons for being unsure or unwilling regarding intention to take COVID-19 vaccine among Japanese people: a large

- cross-sectional national survey. *Lancet Reg Health West Pac.* 2021;14:100223.
33. Viera AJ, Pathman DE, Garrett JM. Adults' lack of a usual source of care: a matter of preference? *Ann Fam Med.* 2006;4(4):359–65.
 34. Stransky ML. Two-year stability and change in access to and reasons for lacking a usual source of care among working-age US adults. *Public Health Rep.* 2017;132(6):660–8.
 35. Chang E, Chan KS, Han HR. Factors associated with having a usual source of care in an ethnically diverse sample of Asian American adults. *Med Care.* 2014;52(9):833–41.
 36. Thorpe JM, Kalinowski CT, Patterson ME, Sleath BL. Psychological distress as a barrier to preventive care in community-dwelling elderly in the United States. *Med Care.* 2006;44(2):187–91.
 37. Campitelli MA, Inoue M, Calzavara AJ, Kwong JC, Guttman A. Low rates of influenza immunization in young children under Ontario's universal influenza immunization program. *Pediatrics.* 2012;129(6):e1421–30.
 38. Haggerty JL, Reid RJ, Freeman GK, Starfield BH, Adair CE, Mckendry R. Continuity of care: a multidisciplinary review. *BMJ.* 2003;327(7425):1219–21.
 39. Bazargan M, Wisseh C, Adinkrah E, Ameli H, Santana D, Cobb S, et al. Influenza vaccination among underserved African-American older adults. *Biomed Res Int.* 2020;2020:2160894.
 40. Kaneko M, Aoki T, Goto R, Ozone S, Haruta J. Better patient experience is associated with better vaccine uptake in older adults: multicentered cross-sectional study. *J Gen Intern Med.* 2020;35(12):3485–91.
 41. Dyche L. Interpersonal skill in medicine: the essential partner of verbal communication. *J Gen Intern Med.* 2007;22(7):1035–9.
 42. Danis K, Georgakopoulou T, Stavrou T, Laggas D, Panagiotopoulos T. Socioeconomic factors play a more important role in childhood vaccination coverage than parental perceptions: a cross-sectional study in Greece. *Vaccine.* 2010;28(7):1861–9.

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