

Association between respiratory syncytial virus vaccination and medical information sources among older Japanese in the post-COVID-19 era: a cross-sectional study

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Abstract

Respiratory syncytial virus (RSV) causes substantial morbidity among older adults; however, RSV vaccination remains limited in Japan. Identifying effective information channels to promote RSV vaccination is particularly important in the post-COVID-19 era. We conducted a nationwide, cross-sectional online survey in Japan among adults aged ≥ 60 years. The analysis examined associations between RSV vaccination status and medical information sources, knowledge regarding RSV infection and vaccination, and prior vaccination history. Among the 8,300 participants, RSV vaccination uptake was 4.2%. Individuals who received the RSV vaccine more frequently reported obtaining information from interpersonal or institution-based sources, including healthcare professionals and workplaces or schools, as well as from media-based sources such as academic websites, LINE, and magazine. RSV vaccination was positively associated with higher knowledge score regarding RSV infection and the RSV vaccine, as well as with prior vaccination against SARS-CoV-2, influenza, and pneumococcal disease. RSV vaccination in older adults in Japan is associated with specific interpersonal and media-based sources of information. Recommendations from healthcare professionals may support individualized vaccination promotion, particularly among individuals with a prior vaccination history, whereas push-based information channels such as LINE may be useful for population-level dissemination of RSV-related knowledge.

Article

The clinical spectrum of respiratory syncytial virus (RSV) disease encompasses mild upper respiratory symptoms to severe lower respiratory tract diseases. RSV is primarily known for its substantial disease burden in infants and young children and is now increasingly recognized as a significant cause of serious respiratory illness in older adults and those with underlying comorbidities [1].

The annual incidence rate of RSV infection in older adults is estimated at 2–7% [1, 2, 3, 4], while the estimated annual incidence rate of seasonal influenza in unvaccinated adults is approximately 4–8% [5, 6]. The incidence of RSV infection is comparable to that of influenza [7, 8]. Additionally, the severity of the RSV infection in hospitalized older patients was equivalent to or greater than that of influenza [9, 10]. Considering the incidence and severity, the societal impact of RSV infection is equivalent to that of influenza. Although multiple antiviral agents against influenza are available, as of 2025, no specific antiviral treatment for RSV has been approved for adults. The absence of treatment options underscores the importance of prevention through vaccination of older adults.

RSV vaccines have demonstrated efficacy in decreasing the incidence, hospitalization, and mortality [11, 12]. In Japan, RSV vaccination was introduced in 2024 and is now approved for adults aged ≥ 60 years. In Japan, awareness remains limited as of 2024, with only 17% of respondents reporting awareness of RSV infection and just 7% aware that an RSV vaccine is available [13].

The short interval since vaccine introduction, hesitancy, and limited public awareness result in low RSV vaccination uptake [14]. Given Japan's large older adult population and the effectiveness of the RSV

vaccine, improving its coverage is an important public health priority. Although effective information sources and dissemination strategies for adult vaccines other than that for RSV were reported in the literature before the COVID-19 pandemic [15], evidence regarding effective information sources for RSV vaccination remains limited. Moreover, although the impact of vaccine hesitancy during the COVID-19 pandemic has been discussed [16, 17], vaccine hesitancy may be higher in the post-COVID-19 era. As evidence accumulates, these information strategies require re-evaluation. Accordingly, to inform strategies aimed at improving RSV vaccination uptake, we examined medical information sources associated with vaccination uptake and quantified their impact using the number needed to be exposed. We also assessed prior vaccination history and knowledge related to RSV.

Methods

Study design and participants

We conducted a cross-sectional study using data obtained from an annual cohort study, the Japan COVID-19 and Society Internet Survey (JACSIS) Study 2024. This study involved a nationwide, cross-sectional, Internet-based survey.

Data collection was conducted by Rakuten Insight, Inc., a major research company specializing in Internet-based surveys and related research. The survey was launched on December 2, 2024, and completed on January 16, 2025. Among all respondents to the 2015–2024 Internet survey, 45,359 were contacted by the survey company. Of these, 26,097 participants who provided responses (response rate = 26,097/45,359; 57.5%) were included in the survey. Additionally, a new supplementary survey using the same questionnaire was administered to panel members aged 16–79 years from January 12, 2025, to January 16, 2025, yielding 1,903 responses. In total, combining the follow-up and supplementary surveys, 28,000 respondents participated.

For this analysis, 2,918 participants were excluded due to invalid responses such as answering the questionnaire in < 600 s; reporting that the number of people living together is more than 15; wrongly answering the question, “Choose the second one from the bottom”; reporting use of all drugs; and reporting having all comorbidities. In Japan, RSV vaccines have been approved for use in adults aged ≥ 60 years. Accordingly, we selected 8,300 individuals aged ≥ 60 years for the analysis. Figure 1 shows a flowchart of the study inclusion. This study was conducted in accordance with the Ethical Guidelines for Life Science and Medical Research Involving Human Subjects. All research protocols were reviewed and approved by the Research Ethics Committee of the Osaka International Cancer Institute (No. 20084-8). Informed consent was obtained electronically from all participants at the time of enrollment.

Definition of variables

Vaccination history

The definition of vaccination history is as follows. RSV vaccine: those who answered that they had been vaccinated previously. Influenza vaccine: those who reported having received at least one dose between the 2023 fiscal year and the period from October 2024 to March 2025. SARS-CoV-2 vaccine: those who reported having received at least one dose between April 2023 and September 2024 or who expressed intent to receive the vaccine after October 2024. Pneumococcal vaccine: those who reported having received the vaccine within the past 5 years.

To examine the association between RSV vaccination and recent uptake of other vaccines, we defined the vaccination time window for other vaccines as described above. In Japan, GSK's Arexvy® and Pfizer's Abrysvo® were launched on January 15 and May 31, 2024, respectively. Because these vaccines were recently introduced and administered as a single dose, the RSV vaccination history was fully captured.

medical information sources

The participants were asked about the sources from which they had obtained information on COVID-19 and other medical topics. The questionnaire included 20 possible sources: interpersonal (family, friends, acquaintances, workplace/school, and healthcare professionals), public figures (celebrities and experts), official websites (governmental agencies and universities/societies), online media (video-sharing sites, social networking services [LINE, Twitter, Facebook, Instagram], and online news), and traditional media (newspapers, magazines, books, television news, television talk shows, and radio). The respondents indicated whether they had obtained information from each source.

RSV knowledge score

The primary outcome was the RSV knowledge score based on three items included in the questionnaire. Participants were asked whether they knew that (1) RSV causes respiratory infections such as bronchitis and pneumonia, (2) older adults and individuals with underlying conditions are at a higher risk of severe disease, and (3) older adults are eligible for RSV vaccination. Each correct response was assigned 1 point, resulting in a total score ranging from 0 to 3, with higher scores indicating greater knowledge of RSV.

Statistical analysis

We conducted multivariate logistic regression analyses to examine the associations between RSV vaccination status and (1) medical information sources, (2) knowledge of RSV infection, and (3) the presence of comorbidities or other vaccinations. Age and sex were included as the covariates. To enhance the applicability of the findings to clinical practice, we did not adjust for factors such as annual income and educational background, which are often difficult to ascertain in routine clinical settings. The adjusted odds ratios (aORs) and 95% confidence intervals (CIs) were calculated using these models. The adjusted number needed to be exposed (aNNE) was calculated using the bootstrap method with 1,000

repetitions. All analyses were considered statistically significant at $p < 0.05$. A variance inflation factor < 3 indicated no substantial multicollinearity. All analyses were performed using R (version 4.3.1) and EZR on R Commander (version 1.68).

Results

Participants' characteristics

The characteristics of all the study participants, RSV vaccine recipients, and non-recipients are shown in Table 1. Among the survey respondents, a total of 8,300 individuals aged 60 or older were included in this study, comprising 4,201 men (50.6%) and 4,099 women (49.4%). Among these 8,300 individuals, the number of recipients of the RSV vaccine, SARS-CoV-2 vaccine, influenza vaccine, and pneumococcal vaccine were 349 (4.2%), 4,981 (60.0%), 3,924 (47.3%), and 2,465 (29.7%), respectively. The vaccination rate for the RSV vaccine was lower than that for the other vaccines. The sex distribution was similar between individuals who received the RSV vaccine and those who did not. Obesity (body mass index [BMI] $\geq 25 \text{ kg/m}^2$) was similar between the two groups. Conversely, several comorbidities, including diabetes mellitus, pneumonia, asthma, chronic kidney disease, and chronic hepatitis or cirrhosis, were more common among RSV vaccination than among non-RSV vaccination, with a larger difference observed in chronic obstructive pulmonary disease (COPD).

Table 1
Characteristics of participants (N = 8,300).

	All participants (n = 8,300)	Participants with RSV vaccination (n = 349)	Participants without RSV vaccination (n = 7,951)
Age, n (%)*			
60–64 years	2,069 (24.9)	52 (14.9)	2,017 (25.4)
65–69 years	1,916 (23.1)	63 (18.1)	1,853 (23.3)
70–74 years	2,011 (24.2)	89 (25.5)	1,922 (24.2)
≥75 years	2,304 (27.8)	145 (41.5)	2,159 (27.2)
Sex, n (%)			
Male	4,201 (50.6)	192 (55.0)	4,009 (50.4)
Female	4,099 (49.4)	157 (45.0)	3,942 (49.6)
Comorbidity, n (%)			
Obesity (BMI ≥ 25 kg/m ²)	1,676 (20.2)	71 (20.3)	1,605 (20.2)
Diabetes	1,267 (15.3)	88 (25.2)	1,179 (14.8)
Pneumonia	1,689 (20.3)	79 (22.6)	1,610 (20.2)
Asthma	905 (10.9)	50 (14.3)	855 (10.8)
Chronic obstructive pulmonary disease	179 (2.2)	26 (7.4)	153 (1.9)
Chronic kidney disease	382 (4.6)	26 (7.4)	356 (4.5)
Chronic hepatitis or Cirrhosis	259 (3.1)	24 (6.9)	235 (3.0)
Medical information sources, n (%)			
Family	3,982 (48.0)	205 (58.7)	3,777 (47.5)
Friends	3,397 (40.9)	175 (50.1)	3,222 (40.5)
Workplaces or schools	1,887 (22.7)	107 (30.7)	1,780 (22.4)
Healthcare professionals	3,804 (45.8)	212 (60.7)	3,592 (45.2)
Celebrity	942 (11.3)	52 (14.9)	890 (11.2)
Experts	2,668 (32.1)	136 (39.0)	2,532 (31.8)

	All participants (n = 8,300)	Participants with RSV vaccination (n = 349)	Participants without RSV vaccination (n = 7,951)
Government websites	3,532 (42.6)	169 (48.4)	3,363 (42.3)
Academic websites	729 (8.8)	60 (17.2)	669 (8.4)
Commercial videos	1,183 (14.3)	75 (21.5)	1,108 (13.9)
LINE	834 (10.0)	74 (21.2)	760 (9.6)
Twitter	366 (4.4)	33 (9.5)	333 (4.2)
Facebook	301 (3.6)	32 (9.2)	269 (3.4)
Instagram	231 (2.8)	27 (7.7)	204 (2.6)
Online news	3,889 (46.9)	163 (46.7)	3,726 (46.9)
Newspapers	4,318 (52.0)	210 (60.2)	4,108 (51.7)
Magazines	980 (11.8)	76 (21.8)	904 (11.4)
Books	879 (10.6)	57 (16.3)	822 (10.3)
Television news	6,541 (78.8)	284 (81.4)	6,257 (78.7)
Television talk shows	4,604 (55.5)	213 (61.0)	4,391 (55.2)
Radio	1,587 (19.1)	97 (27.8)	1,490 (18.7)

*Percentages of each characteristic in all participants (left column) /vaccinated group for RSV vaccine (middle column) /and non-vaccinated group for RSV vaccine (right column) (same as below). n denotes number. BMI: body mass index.

Impact of RSV vaccination and medical information sources

Table 2 shows the associations between RSV vaccination and the type of medical information source using multivariate logistic regression analyses. RSV vaccination was significantly associated with information obtained from workplaces or schools, healthcare professionals, research institution websites (such as universities and academic societies), LINE, and magazines. Conversely, open social networking services such as Facebook and Instagram did not show a significant association with RSV vaccination.

Furthermore, the number needed to be exposed (NNE) was calculated for each information source. The adjusted NNE was 70 for workplaces and schools, 65 for healthcare professionals, 52 for research institution websites, 39 for LINE, and 45 for magazines.

Table 2
Associations between RSV vaccination and the type of medical information sources.

All participants (n = 8,300)					
	Adjusted OR[†]	95%CI	p-value	Adjusted NNE[‡]	NNE 95%CI
Family					
No	1 (reference)	-	-	-	-
Yes	1.15	0.87–1.53	0.323	178	–1737 ∞ ∞ 1926
Friends					
No	1 (reference)	-	-	-	-
Yes	0.93	0.69–1.25	0.621	-341	–4011 ∞ ∞ 1944
Workplace or school					
No	1 (reference)	-	-	-	-
Yes	1.40	1.05–1.87	0.023	70	33–473
Healthcare professionals					
No	1 (reference)	-	-	-	-
Yes	1.47	1.13–1.92	0.004	66	39–175
Celebrity					
No	1 (reference)	-	-	-	-
Yes	0.75	0.51–1.10	0.135	-95	–785 ∞ ∞ 491
Expert					
No	1 (reference)	-	-	-	-
Yes	0.92	0.69–1.22	0.564	-304	–2743 ∞ ∞ 3317
Government websites					
No	1 (reference)	-	-	-	-
Yes	0.90	0.69–1.17	0.416	-234	–2967 ∞ ∞ 1766
Academic websites					
No	1 (reference)	-	-	-	-
Yes	1.52	1.05–2.20	0.026	52	23–334
Commercial video					

All participants (n = 8,300)					
	Adjusted OR [†]	95%CI	p-value	Adjusted NNE [‡]	NNE 95%CI
No	1 (reference)	-	-	-	-
Yes	0.99	0.70–1.41	0.973	-4272	-2310 ∞ ∞ 2258
LINE					
No	1 (reference)	-	-	-	-
Yes	1.73	1.21–2.48	0.003	39	20–129
Twitter					
No	1 (reference)	-	-	-	-
Yes	1.19	0.67–2.09	0.551	138	-970 ∞ ∞ 873
Facebook					
No	1 (reference)	-	-	-	-
Yes	1.16	0.64–2.11	0.617	157	-1194 ∞ ∞ 829
Instagram					
No	1 (reference)	-	-	-	-
Yes	1.41	0.73–2.70	0.306	65	-581 ∞ ∞ 626
Online news					
No	1 (reference)	-	-	-	-
Yes	0.78	0.61–1.00	0.049	-101	-669 ∞ ∞ 203
Newspapers					
No	1 (reference)	-	-	-	-
Yes	1.00	0.76–1.31	0.995	-30036	-2529 ∞ ∞ 3401
Magazines					
No	1 (reference)	-	-	-	-
Yes	1.62	1.12–2.34	0.011	46	23–241
Books					
No	1 (reference)	-	-	-	-
Yes	0.69	0.46–1.05	0.081	-77	-552 ∞ ∞ 320
Television news					

All participants (n = 8,300)					
	Adjusted OR [†]	95%CI	p-value	Adjusted NNE [‡]	NNE 95%CI
No	1 (reference)	-	-	-	-
Yes	0.82	0.57–1.17	0.272	-119	-1723 ∞ ∞ 924
Television talk show					
No	1 (reference)	-	-	-	-
Yes	1.05	0.80–1.38	0.741	549	-4488 ∞ ∞ 2871
Radio					
No	1 (reference)	-	-	-	-
Yes	1.16	0.88–1.53	0.292	165	-1426 ∞ ∞ 1338

[†]Estimated using multivariable logistic regression modeling with adjustment for age, sex and all listed variables. [‡]Calculated using the bootstrap method. Values of p < 0.05 were considered statistically significant. OR: odds ratio, CI: confidence interval, NNE: number needed to be exposed.

Relationship between knowledge of RSV vaccination and RSV infection

Table 3 shows whether the amount of knowledge about RSV infection is associated with receiving the RSV vaccination, based on multivariate logistic regression analyses. The questionnaire included three items assessing knowledge of RSV infection. The analysis results showed that awareness of RSV infection was significantly associated with RSV vaccination, irrespective of the number of knowledge items endorsed. Furthermore, this association became stronger as the number of knowledge items increased.

Table 3
Associations between RSV vaccination and knowledge about RSV infection and vaccine.

All participants (n = 8,300)			
	Adjusted OR [†]	95%CI	p-value
Number of pieces of knowledge about RSV infection and vaccine			
None	1 (reference)	-	-
One item	1.50	1.06–2.13	0.023
Two items	3.36	2.48–4.56	< 0.001
Three items	6.50	4.95–8.55	< 0.001

[†]Estimated using multivariable logistic regression modeling with adjustment for age, sex and the number of pieces of knowledge about RSV infection. Values of $p < 0.05$ were considered statistically significant. OR: odds ratio, CI: confidence interval.

Relationship between RSV vaccination and other vaccinations or comorbidities

RSV vaccination had a significant positive association with pneumococcal, influenza, and SARS-CoV-2 vaccination (Table 4). Among comorbidities, RSV vaccination had significant association with diabetes, COPD, and chronic liver disease. Bronchial asthma was associated with a tendency toward RSV vaccination; however, this difference was not statistically significant.

Table 4
Associations between RSV vaccination and the presence of comorbidities or other vaccinations.

All participants (n = 8,300)			
	Adjusted OR [†]	95%CI	p-value
SARS-CoV-2 Vaccine			
unvaccinated	1 (reference)	-	-
vaccinated	1.87	1.38–2.53	< 0.001
Influenza vaccine			
unvaccinated	1 (reference)	-	-
vaccinated	1.57	1.21–2.03	< 0.001
Pneumococcal vaccine			
unvaccinated	1 (reference)	-	-
vaccinated	1.83	1.44–2.33	< 0.001
Obesity (BMI ≥ 25 kg/m ²)			
No	1 (reference)	-	-
Yes	0.99	0.75–1.31	0.954
Diabetes			
No	1 (reference)	-	-
Yes	1.56	1.19–2.04	0.001
Pneumonia			
No	1 (reference)	-	-
Yes	0.82	0.61–1.11	0.199
Asthma			
No	1 (reference)	-	-
Yes	1.21	0.85–1.72	0.28
Chronic obstructive pulmonary disease			
No	1 (reference)	-	-
Yes	3.00	1.83–4.91	< 0.001
Chronic kidney disease			

	All participants (n = 8,300)		
	Adjusted OR [†]	95%CI	p-value
No	1 (reference)	-	-
Yes	1.02	0.64–1.63	0.93
Chronic hepatitis or Cirrhosis			
No	1 (reference)	-	-
Yes	1.65	1.02–0.68	0.04

[†]Estimated using multivariable logistic regression modeling with adjustment for age, sex and all listed variables. Values of $p < 0.05$ were considered statistically significant. OR: odds ratio, CI: confidence interval, BMI: body mass index.

Discussion

In this nationwide study of adults aged ≥ 60 years in Japan, we examined factors associated with RSV vaccination, focusing on medical information sources, prior vaccination history, and knowledge regarding RSV infection. Individuals who received the RSV vaccine more frequently reported obtaining information from their workplaces or schools, healthcare professionals, academic websites, LINE, and magazines. RSV vaccination was also associated with higher knowledge scores for RSV infection and vaccine. Additionally, RSV vaccination was positively associated with prior vaccinations against SARS-CoV-2, influenza, and pneumococcal diseases.

Before the COVID-19 pandemic, vaccination uptake was associated with a broad range of information sources, including interpersonal and professional sources (such as healthcare professionals), official and institutional websites, social media and messaging platforms, and traditional mass media [15, 18, 19, 20]. Prior vaccination status has consistently been associated with the uptake of other vaccines [21, 22]. Following the COVID-19 pandemic, where strong hesitancy toward vaccines impacted vaccination rates [16, 17], re-examining which information sources and populations can be effectively targeted for vaccination promotion is therefore necessary, especially focusing on RSV vaccination in the post-COVID-19 era.

In our study, interpersonal or institution-based sources, such as healthcare professionals, workplaces, and schools, were positively associated with RSV vaccination. Healthcare professionals, workplaces, and schools can serve as credible channels for vaccine-related communication, and recommendations and advice from physicians and public health experts have been associated with vaccination uptake even before the COVID-19 pandemic [18, 23]. From an implementation standpoint, recommendations from healthcare professionals may be particularly effective because they can be delivered directly during

clinical encounters, especially among individuals with a prior vaccination history or chronic respiratory disease.

Our study also showed that media-based medical information sources, including LINE, academic websites, and magazines, were positively associated with RSV vaccination, even in the post-COVID-19 era of prevalent vaccine hesitancy. LINE has functioned as a practical channel for vaccine-related communication in Japan, and exposure to LINE-based information has been associated with vaccination uptake in an Internet-based survey conducted in 2021 [24]. Academic websites and magazines are considered important sources of vaccine-related information [25, 26]. Conversely, in our analysis, open social networking services such as Facebook and Instagram were not associated with RSV vaccination uptake. These platforms may expose users to a combination of accurate information and misinformation, potentially reinforcing vaccine hesitancy, particularly among individuals who already have hesitant attitudes and are more likely to seek negative or critical information [27]. Therefore, information sources that were effective before the COVID-19 pandemic may not necessarily remain effective in the current context, and the effectiveness of passive information dissemination may continue to decline compared with that in the pre-COVID-19 period. Our findings indicate that push-based information channels such as LINE and magazines may be effective in delivering vaccine-related information to a broad audience. These channels can reach individuals with or without vaccine hesitancy. In contrast, academic websites may be preferentially accessed by individuals who already hold favorable attitudes toward vaccination, and therefore, may be less effective as intervention tools for broadly disseminating vaccine-related information. Overall, in our study, RSV vaccination was positively associated with trusted information sources, which is broadly consistent with findings from pre-COVID-19 literature on other adult vaccines [28]. Although the COVID-19 pandemic may have shaped attitudes towards vaccines, our findings indicate that the general pattern of associations between trusted information channels and vaccination behavior remained largely consistent in the post-COVID-19 era.

From an implementation perspective, our findings provide insights regarding effective strategies for promoting RSV vaccination.

Among interpersonal or institution-based sources, workplaces or schools (NNE = 70) may have their limits in disseminating information, as individuals aged ≥ 65 years are less likely to be reached due to retirement in Japan. Although time constraints in busy clinical settings may constrain the ability of healthcare professionals (NNE = 66) to recommend vaccination to all patients, selectively targeting individuals with a prior vaccination history may be an effective strategy to increase RSV vaccination.

Among the media-based medical information sources, magazines (NNE = 46) may reach a relatively limited and self-selected audience. LINE (NNE = 39) is widely used among older adults in Japan [29]. LINE may provide more efficient and large-scale dissemination of vaccine-related information through proactive messaging.

The RSV vaccination was associated with higher knowledge scores regarding RSV infection and vaccine. In this analysis, greater knowledge about RSV infection was strongly associated with higher vaccination

rates among individuals aged 65 years and older. A previous report [30] similarly demonstrated that intention to receive the RSV vaccine in pregnant women was significantly associated with their level of knowledge of RSV infection and the RSV vaccine. These findings indicate that enhancing knowledge regarding RSV infection and vaccination may play a key role in improving RSV vaccination uptake among healthcare professionals or LINE.

RSV vaccination is positively associated with prior vaccination against SARS-CoV-2, influenza, and pneumococcal diseases. These findings are consistent with the pre-COVID-19 observations and may, in part, be explained by a greater willingness to engage in preventive health behaviors (e.g., health checkups and smoking cessation) and more frequent contact with healthcare services due to chronic diseases [31]. However, disparities in vaccination behavior may have widened since the COVID-19 pandemic, with individuals who have higher health awareness being more likely to receive vaccination, while those with lower health awareness remain unvaccinated. Therefore, targeting individuals with a vaccination history may be even more important during the post-pandemic period. Our results also showed that among chronic conditions, only COPD was significantly associated with RSV vaccination uptake, whereas chronic kidney disease and chronic liver disease were not. These findings suggest that the presence of chronic disease alone may be insufficient to increase vaccination uptake, and that chronic respiratory disease, in particular, may play a more important role in motivating RSV vaccination. Our results indicate that recommending RSV vaccination to individuals with a prior vaccination history, particularly those with COPD, may represent an effective strategy for improving RSV vaccination uptake. With regard to COVID-19 vaccination, our analysis focused on individuals who received voluntary SARS-CoV-2 vaccination between April 2023 and September 2024 or who expressed an intention to receive voluntary vaccination after October 2024, rather than individuals who received fully government-covered routine vaccinations only during the early phase of the pandemic. Thus, recommending vaccination to individuals with a prior vaccination history may represent an effective strategy, although the timing of previous SARS-CoV-2 vaccination should be carefully considered. Our overall analysis suggests that increasing awareness of RSV through personalized recommendations from healthcare professionals for individuals with a prior vaccination history, together with the dissemination of media-based medical information via LINE to the general population, may represent a promising strategy.

Although healthcare professionals remain among the most trusted sources of vaccine-related information for older adults, their reach is inherently limited to those who actively seek medical care. In contrast, LINE, which is widely used among older adults in Japan, enables rapid, repeated, and low-burden dissemination of health information to a broader population, including those with infrequent healthcare visits. Thus, healthcare professionals and LINE may serve complementary roles in promoting vaccination

This study had some limitations. First, this study involved a retrospective cross-sectional analysis; therefore, causal relationships could not be established. Second, the questionnaire asked about the sources from which participants had obtained information on COVID-19 and other medical topics, rather than information sources specific to RSV. Third, the self-reported response method may have introduced

recall or reporting bias. Fourth, as surveys were conducted online, selection bias may have been introduced, potentially including individuals with higher information literacy and a greater ability to use modern electronic media than that of the general population.

Conclusions

Individuals who received the RSV vaccine more frequently reported obtaining information from their workplaces or schools, healthcare professionals, academic websites, LINE, and magazines. RSV vaccination was also associated with higher knowledge scores regarding RSV infection and the RSV vaccine, as well as with prior vaccination against SARS-CoV-2, influenza, and pneumococcal disease. Healthcare professionals may be effective in delivering individualized interventions to enhance RSV vaccination uptake, whereas LINE may be particularly suitable for population-level social interventions.

Declarations

Additional Information

Competing Interests

Kazuhisa Asai reports receiving lecture fees from AstraZeneca, GlaxoSmithKline and Sanofi; Tetsuya Watanabe, receiving lecture fees from AstraZeneca, GlaxoSmithKline, Sanofi and Regeneron; Takahiro Tabuchi received financial support for research (research fundings, consulting fees or lecture fees) from Daiichi Sankyo Healthcare Co., Ltd., Johnson & Johnson K.K., Data Seed Inc., Workout-Plus LLC, EMMA Co., Ltd, Address Inc., and CotoIT Inc.

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Author Contribution

T.T. had full access to all of the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis. Study concept and design: all authors; acquisition of data: T.T.; analysis and interpretation of data: all authors; drafting of the manuscript: M.T.; critical revision of the manuscript intellectual content: all authors; statistical analysis: M.T.; and study supervision: K.Y., K.A., T.T., and T.K.

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Data Availability

The data are not publicly available due to privacy restrictions, but available from Takahiro Tabuchi (E-mail: tabuchitak@gmail.com) on reasonable request.

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Figures

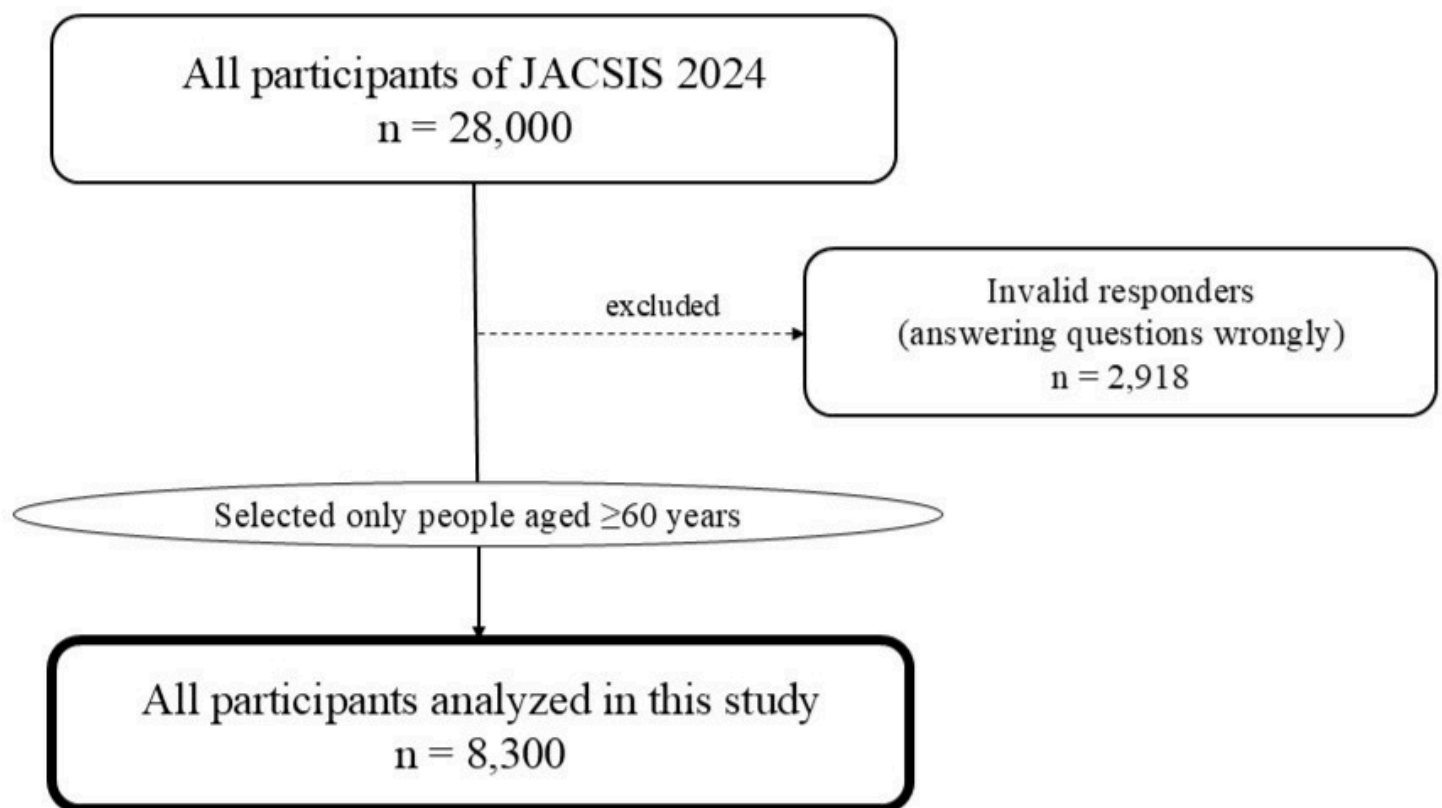


Figure 1

A flowchart of the study inclusion