


BMJ Open South Asian Youth as Vaccine Agents of Change (SAY-VAC): evaluation of a public health programme to mobilise and empower South Asian youth to foster COVID-19 vaccine-related evidence-based dialogue in the Greater Toronto and Hamilton Area, Canada

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ABSTRACT

Objectives There have been substantial amounts of misinformation surrounding the importance, safety and effectiveness of the COVID-19 vaccine. The impacts of this misinformation may be augmented as they circulate among ethnic communities, who may concurrently face other barriers related to vaccine uptake and access. To combat some of the key sources of COVID-19 vaccine misinformation among the South Asian communities of the Greater Toronto and Hamilton Area (GTHA), an interdisciplinary team of researchers and marketing experts established the South Asian Youth as Vaccine Agents of Change (SAY-VAC) programme to support and empower South Asian youth to disseminate COVID-19 vaccine information.

Design Cross-sectional and one-group pretest–post-test design.

Setting GTHA.

Participants South Asian youth (18–29 years).

Intervention The team partnered with grass-roots South Asian organisations to collaborate on shared objectives, curate key concerns, create video products regarding the COVID-19 vaccine that would resonate with the community, disseminate the products using established social media channels and evaluate the effectiveness of this effort.

Outcomes We assessed the change in self-reported knowledge about the COVID-19 vaccine and participant confidence to facilitate a conversation around the COVID-19 vaccine using pre-post surveys, after the implementation of the SAY-VAC programme.

Results In total, 30 South Asian youth (median age=23.2 years) from the GTHA participated in the programme. After completing the SAY-VAC programme, participants reported an increase in their self-reported knowledge regarding the COVID-19 vaccine from 73.3% to 100.0% ($p=0.005$),

STRENGTHS AND LIMITATIONS OF THIS STUDY

- ⇒ Cultivation of collaborative multisectoral partnerships.
- ⇒ Use of different avenues to curate key COVID-19 vaccine concerns.
- ⇒ Use of diverse dissemination strategies (eg, cross-promoting products with support from other organisations while concurrently working more actively with youth ambassadors on tailored outreach).
- ⇒ As this was a small-scale community intervention (which could potentially be scaled up), our sample size was relatively small.
- ⇒ Our convenience sample was not representative of the entire South Asian population in Canada (eg, none of the participants self-identified as Muslim, Pakistani or Bengali, who compose a sizeable proportion of the South Asian population in Canada).

and their self-reported confidence to have a conversation about the vaccine with their unvaccinated community members increased from 63.6% to 100.0% ($p=0.002$). Overall, 51.9% of the participants reported being able to positively affect an unvaccinated/community member's decision to get vaccinated.

Conclusions The SAY-VAC programme highlights the importance of community partnerships in developing and disseminating culturally responsive health communication strategies. A constant assessment of the evidence and utilisation of non-traditional avenues to engage the public are essential.

INTRODUCTION

There has been a substantial amount of misinformation surrounding the importance,



safety and effectiveness of the COVID-19 vaccine. This may be attributable to the ‘infodemic’ that resulted from scientists, media outlets (eg, newspapers), healthcare professionals and government officials sharing widespread information surrounding the pandemic and the vaccine without creating a centralised verified source for the general public.¹ Many marginalised groups have faced challenges trying to understand such variable information throughout the pandemic due to language barriers and/or lack of access to technology that makes such information accessible.^{2,3} Developing evidence demonstrates that exposure to misinformation and inability to access accurate information can lower one’s confidence in the COVID-19 vaccine.⁴

Certain subsets of the South Asian community (people originating from India, Pakistan, Sri Lanka, Bangladesh and/or Nepal) may be more prone to consume misinformation related to alternative and complementary forms of medicine practised in the culture.⁵ Many South Asians may also prefer traditional health options related to immune boosting regimens.⁶ This is compounded by the disproportionate impact of COVID-19 on South Asians living in Canada, including being at increased risk of infection, intensive therapy admission and death; while being less confident in the vaccine.^{7–9} At the roll-out of the vaccine programme in Canada, about 20% of adult South Asians from Ontario reported that they were unlikely to receive vaccination against COVID-19, compared with about 40% of the Black population and about 25% of non-visible minorities.¹⁰ Some preliminary survey-based research conducted in the South Asian community of the UK suggests that such lack of confidence in the COVID-19 vaccine originates from concerns around its rapid development, ingredients (chemical preservatives, presence of animal products as ingredients, etc) and long-term side effects.¹¹ Thus, equipping under-represented communities such as South Asians with accurate information that is culturally specific may help them navigate these *infodemics* in the future.¹²

Several health promotion practices have established the importance of engaging ‘independent’ individuals that are essential in health promotion initiatives due to their ability to act as change agents in diverse ways.^{13,14} These ‘agents of change’ are crucial in achieving mutually beneficial health outcomes.¹³ In fact, several notable mass vaccination efforts across the globe, such as Nigeria, and the human papillomavirus vaccination campaign in the USA have employed diverse groups and individuals as agents of change to successfully improve vaccine confidence among the public.^{14,15} Thus, it is plausible that South Asian youth can serve as agents of change due to their role as technological experts and purveyors of evidence-based information in their respective large multigenerational households.

The Greater Toronto and Hamilton Area (GTHA) of Ontario is a region with a high concentration of South Asians (approximately 15%).^{16–19} Several community-based health promotion initiatives have been developed

over the course of the pandemic to disseminate culturally responsive content to address the misinformation in under-represented communities like South Asians.²⁰ However, a coordinated effort that addresses multiple different facets of behavioural change theory and is inclusive of diverse media platforms such as video-based content, remains lacking. This paper outlines a roadmap that illustrates how an effective community health promotion campaign, *South Asian Youth as Vaccine Agents of Change (SAY-VAC)*, aimed at addressing misinformation and improving vaccine confidence among South Asians in the GTHA during COVID-19, using youth as agents of change, was conducted. The SAY-VAC programme aimed to: (1) create a series of evidence-based narrative messages in the form of engaging videos (‘Arts based Knowledge Translation’) to address the key sources of vaccine hesitancy/lack of confidence among South Asians living in Canada (eg, religious concerns stemming from vaccine ingredients, lack of culturally reflective and effective materials in South Asian languages); and (2) collaborate with digitally savvy youth ambassadors who act as ‘agents of change’ to disseminate the videos and foster evidence-based dialogue within their familial networks. The primary objective of this programme evaluation is to assess the change in self-reported knowledge about the COVID-19 vaccine and self-reported confidence in conversing about the vaccine with their unvaccinated community members. The knowledge mobilisation plan included a two-pronged approach: (1) partnering with several grass-roots organisations to share our videos via social media platforms; and (2) hosting ‘action station’ webinars with youth in the GTHA to better equip them to foster COVID-19 vaccine dialogue within their households.

METHODS

Participants and recruitment

In addition to recruiting within the COVID-19 CommUNITY study,⁹ 30 SAY-VAC youth ambassadors were recruited through a convenience sample within the South Asian community in Ontario. South Asian community organisations and South Asian student organisations in Ontario were contacted to advertise participant recruitment through their email listservs and social media networks. A small number of participants were recruited to ensure feasibility of this small-scale community intervention, which could potentially be scaled up. Additionally, the study team contacted South Asian youth within their personal and professional networks, which resulted in snowball sampling. The inclusion criteria to participate in the study were self-identifying as South Asian (people originating from or having ancestry from India, Pakistan, Sri Lanka, Bangladesh and/or Nepal), being aged 18–29 years at recruitment and living in the GTHA. The GTHA comprises the cities of Toronto and Hamilton, and the municipalities of Halton, Peel, York and Durham, with a total population of 7.66 million representing half of the population in the province of Ontario.¹⁷ After attending

the orientation session, debrief session and completing the presurveys and postsurveys, participants were compensated with a \$C50 gift card as a token of appreciation.

SAY-VAC programme

The SAY-VAC programme was a digital media health programme initiated by an interdisciplinary group composed of South Asian health researchers, epidemiologists, medical students and marketing specialists in the private sector. The SAY-VAC programme started on 1 September 2021 and was run for 1 week (due to financial and timeline constraints as governed by the Public Health Agency of Canada grant that funded the project). A mandatory orientation session was held through video call on Zoom with the study team and 30 youth ambassadors. The study team introduced the SAY-VAC programme and the tools (videos and corresponding information sheet), its objectives and the roles and responsibilities of the youth ambassadors.

To create a culturally sensitive video to address current COVID-19 vaccine concerns in the South Asian community, the team obtained feedback from local grass-roots South Asian community organisations. The marketing working group used this information to hold a creative brainstorming session with the full SAY-VAC team to crystallise visuals, colours and a culturally authentic plot for the video. From this, a storyboard was developed, which was passed along to the video production team to operationalise. The video production team recruited community members reflective of the target audience through personal contacts and social media. Recruited community members were then asked to participate in reading the script onscreen while the video production team developed the corresponding animations and B-roll. Two informational videos were developed: 1) a full English version and 2) a multilingual version interweaving the top four spoken South Asian languages in Canada (Punjabi, Hindi, Tamil, Gujarati) as confirmed by Statistics Canada.¹⁶ The videos were uploaded onto YouTube (<https://www.youtube.com/watch?v=15VcB-Cuv2Q0>) and downloadable compressed versions, which youth ambassadors were encouraged to share in their familial/community networks through WhatsApp, Facebook and other social media. These videos were intended to be a means through which conversations about the COVID-19 vaccine could be initiated with family/community members and to encourage unvaccinated individuals to consider receiving a vaccine.

Data collection and analysis

Data were collected at SAY-VAC programme initiation and a week later at programme termination. Immediately before SAY-VAC programme initiation on 1 September 2021, a presurvey was completed by participants to collect sociodemographic information and to measure programme evaluation variables. One week later, at programme termination, an online debrief session was hosted by the study team to discuss with youth ambassadors the successes

and challenges of the programme and the video, and the feedback from family/community members. Participants completed a postsurvey immediately before the debrief session. The study design is cross-sectional and one-group pretest–post-test design. Survey data were collected using a secure web-based application (REDCap).

Descriptive statistics were conducted to describe the sociodemographic characteristics of the cohort of SAY-VAC youth ambassadors, reporting mean with 95% CI for continuous variables and proportion for categorical variables. Descriptive statistics, such as proportion, and proportion of participants who agreed or strongly agreed on a 7-point Likert scale, were used to assess the effectiveness of the SAY-VAC programme. To compare dichotomous variables at programme initiation and termination, McNemar's test was used to compare proportions between paired data. Participants who responded 'prefer not to say' and 'not applicable' in either the presurvey or postsurvey for each question were excluded from this analysis due to missing data. Based on the research objectives, the primary outcomes of interest were self-reported knowledge about the COVID-19 vaccine and participants' confidence to facilitate a conversation around the COVID-19 vaccine. Secondary outcome of interest is having convinced at least one unvaccinated family or community member to get vaccinated. All analyses were performed using Stata (V.16.1).

Patient and public involvement

Patients were not involved in the design, conduct or reporting of this study. The public was involved in the conduct of this study (data collection and dissemination).

RESULTS

Description of study population

In total, 30 participants were enrolled in the SAY-VAC programme, and all completed the presurvey and postsurvey. Of the total, 22 (73.3%) self-identified as cisgender females, 6 (20.0%) as cisgender males, 1 (3.3%) as gender non-conforming and 1 (3.3%) preferred not to disclose (table 1). Participants reported a median age of 23.2 years (IQR 20, 25). All participants lived in the GTHA, and 27 (90.0%) had immediate or extended family living in the GTHA. All participants self-identified as South Asian, with the most represented ethnic groups being Gujarati (26.7%), Punjabi (20.0%) and Tamil (16.7%). Most of the participants spoke at least one other language in addition to English (83%). The most spoken language other than English was Hindi (50.0%), followed by Gujarati (26.7%) and Punjabi (23.3%). In terms of religious affiliation, about half of the participants self-identified as Hindu (56.7%), followed by Christian (23.3%). All participants had received at least one dose of the COVID-19 vaccine with 29 (96.7%) having received both doses and one (3.3%) having received exactly one dose.

Presurvey

At the time when the presurvey was administered, 22 (73.3%) participants agreed or strongly agreed that

Table 1 Demographic characteristics of SAY-VAC programme ambassadors

	n	%
Gender		
Cisgender male	6	20.0
Cisgender female	22	73.3
Gender non-conforming	1	3.3
Prefer not to say	1	3.3
	Median	IQR
Age	23	20, 25
Live in the Greater Toronto and Hamilton Area (GTHA)		
Yes	30	100.0
Have immediate or extended family living in the GTHA		
Yes	27	90.0
No	3	10.0
Self-identify as South Asian (people originating or having ancestry from India, Pakistan, Sri Lanka, Bangladesh and/or Nepal)		
Yes	30	100.0
Ethnic origin (select all that apply)		
Gujarati	8	26.7
Punjabi	6	20.0
Tamil	5	16.7
Telugu	4	13.3
Sri Lankan	3	10.0
East Indian	2	6.7
Goan	1	3.3
Malayali	1	3.3
Other	1	3.3
Spoken languages other than English (select all that apply)		
Hindi	15	50.0
Gujarati	8	26.7
Punjabi	7	23.3
Tamil	7	23.3
Telugu	4	13.3
None	5	16.7
Urdu	2	6.7
Malayalam	1	3.3
French	1	3.3
Religion		
Hindu	17	56.7
Christian	7	23.3
No religion	3	10.0
Sikh	2	6.7
Prefer not to say	1	3.3
SAY-VAC, South Asian Youth as Vaccine Agents of Change.		

they felt knowledgeable about the COVID-19 vaccine. Additionally, 19 (60.0%) participants agreed or strongly agreed that they felt confident to facilitate a conversation with an unvaccinated individual in their family or in the South Asian community who is eligible for the COVID-19 vaccine to get vaccinated. A third (33.3%) of the participants knew at least one unvaccinated family member or member of the South Asian community who was eligible to receive the COVID-19 vaccine. The participant's understanding of this family/community member's reason for not getting vaccinated included a multitude of reasons as identified previously in the literature (online supplemental table 1).¹¹ Overall, 22 (73.3%) participants had facilitated a conversation with an unvaccinated family/community member who was eligible for the vaccine and 21 (70.0%) participants had been able to convince at least one unvaccinated family/community member to be vaccinated over the course of the pandemic and prior to the administration of the presurvey.

Postsurvey

At the time of the postsurvey, 15 (50.0%) participants knew at least one unvaccinated family member or member of the South Asian community who was currently eligible to receive the COVID-19 vaccine while 23 (76.7%) had facilitated a conversation with an unvaccinated family/community member (online supplemental table 1) over the course of the pandemic and until the time of the postsurvey. Since the SAY-VAC orientation session, about half (14, 46.7%) of participants were able to convince at least one unvaccinated individual to get vaccinated within a week. Most participants (28, 93.4%) agreed or strongly agreed that they felt knowledgeable about the COVID-19 vaccine. Most participants (28, 93.4%) also agreed or strongly agreed that they felt confident to facilitate a conversation with an unvaccinated family/community member to get vaccinated. In terms of the SAY-VAC orientation session, most participants agreed or strongly agreed that they learnt new information (22, 73.3%) and that it empowered them to facilitate conversations about the COVID-19 vaccine with family/community members (26, 86.7%). Most participants agreed or strongly agreed that the SAY-VAC video empowered them to facilitate a conversation about the COVID-19 vaccine with family/community members (25, 83.4%), and that their family/community members found the video helpful in answering their questions (21, 70.0%). Among the 14 participants who were able to convince a family/community member to get vaccinated, all agreed or strongly agreed that the SAY-VAC programme helped them convince at least one unvaccinated family/community member to get vaccinated. Among all participants, 24 (80%) agreed or strongly agreed that the programme helped them answer questions about the COVID-19 vaccine to already vaccinated family/community members.

Examining the proportion of participants who agreed or strongly agreed to statements rated on a 7-point Likert scale between presurveys and postsurveys, participants'

Table 2 Comparison of dichotomous variables before and after programme implementation (1 week duration)

	n	Presurvey (%)	Postsurvey (%)	P value*
I feel knowledgeable about the COVID-19 vaccine (agree or strongly agree).	28	73.3	100.0	0.005
I feel confident to facilitate a conversation with an unvaccinated individual in my family or in the South Asian community who is eligible for the COVID-19 vaccine to get vaccinated (agree or strongly agree).	29	63.3	93.1	0.006
Know at least one family member or member of the South Asian community who is currently eligible for vaccination but has not yet received at least one dose of the COVID-19 vaccine.	29	34.5	51.7	0.025
Had facilitated a conversation with an unvaccinated individual in their family or in the South Asian community who was eligible for the COVID-19 vaccine to get vaccinated.	30	73.3	76.7	0.763
Had been able to convince at least one unvaccinated individual in your family or community who was eligible for the COVID-19 vaccine to get vaccinated.	27	70.4	51.9	0.132

*McNemar's test.

self-rated knowledge about the COVID-19 vaccine increased from 73.3% to 100.0% ($p=0.005$) and their self-rated confidence to facilitate a conversation about the COVID-19 vaccine with unvaccinated family/community members increased from 63.3% to 93.1% ($p=0.006$). Comparing the dichotomous variables between presurveys and postsurveys, knowing at least one unvaccinated family/community member increased from 34.5% to 51.7% ($p=0.025$). However, there was not a statistically significant difference between presurveys and postsurveys regarding facilitating a conversation with an unvaccinated family/community member (70.4%–51.9%, $p=0.132$) and being able to convince an unvaccinated family/community member to get vaccinated (73.3%–76.7%, $p=0.76$) (table 2).

DISCUSSION

Overall, the SAY-VAC programme was effective—comparison of the proportion of participants who agreed or strongly agreed that they felt knowledgeable about the COVID-19 vaccine and confident to facilitate conversations about the vaccine both increased to 100.0% and 93.1%, respectively, in the postsurvey. Approximately half (51.9%) of youth ambassadors reported being able to positively influence an unvaccinated family/community member to be vaccinated, after only 1 week of implementing the programme. Additionally, the programme helped provide information and tools to facilitate conversations with unvaccinated family/community members. The proportion of youth ambassadors knowing at least one unvaccinated family/community member increased from 34.5% in the presurvey to 51.7% in the postsurvey. It was possible that in the process of sharing the video within their familial and community networks, youth ambassadors became aware of the vaccination status of members that they were not aware of previously. Additionally, the proportion of youth ambassadors reporting having been able to convince an unvaccinated family/

community member to get vaccinated decreased from 70.4% to 51.9%. In the presurvey, individuals were asked if they were ever able to convince a family/community member to be vaccinated compared with the postsurvey, which referred to the last week during the programme duration. Given that the presurvey asked over a longer period, it is understandable that the proportion would be higher. Also, it is possible that eligible individuals who remain unvaccinated by September 2021 may have more concerns regarding the vaccine and may be more difficult to convince to be vaccinated.

At the onset of the project, an interdisciplinary team (multisectoral partnerships across medicine, epidemiology, South Asian health research, knowledge translation science and practice, creative design and marketing) was established so that we could foster experience-based guidance and build off the multiple perspectives from a diverse group. Particularly, it was important to foster collaborations between academia (to understand the current scientific evidence) and marketing and communications (to understand how to optimise the crafting, simplification and dissemination of messages). All individuals were brought together in a collaborative session to generate ideas about values, imagery, objectives and knowledge to be conveyed in the videos. Collaborative tools (eg, Miro Board, an online platform to brainstorm ideas with ease) which allowed for active and equitable partnership among all team members were used. Throughout the course of the project, South Asian-based partner organisations were engaged early and often to (a) crystallise current needs/concerns in the South Asian community; and (b) mobilise sharing of the final narrative videos.

Some of the key big picture learnings from implementing this programme included the following: (1) Establishing an avenue to proactively plan for the changing guidelines around COVID-19. This can be achieved by prioritising on-the-ground needs assessment in regular

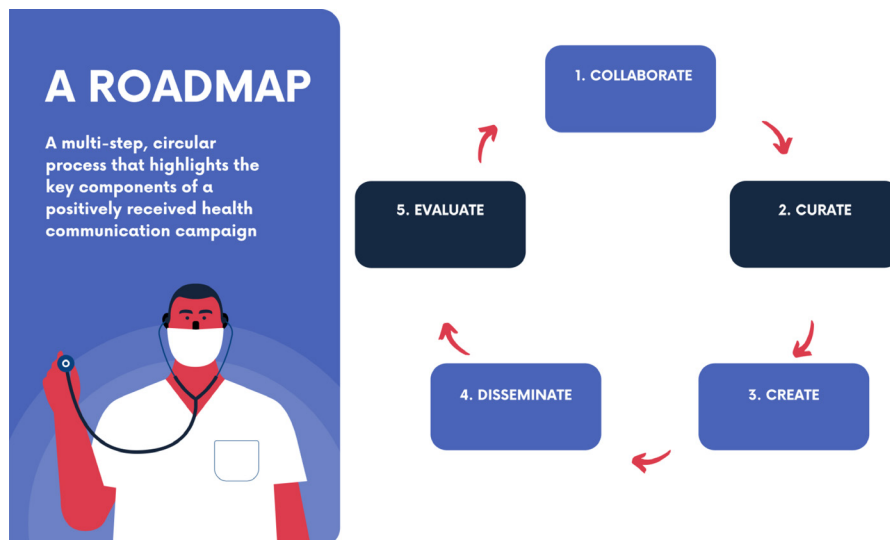


Figure 1 Roadmap highlighting the key processes undertaken during the South Asian Youth as Vaccine Agents of Change (SAY-VAC) campaign.

intervals and consistently reviewing the changing landscape. For example, early in the summer of 2021, the conversation was heavily focused on vaccine brands, mixing and concerns of side effects. As autumn of 2021 approached, the conversation had shifted towards vaccinations of younger cohorts of children aged older than or equal to 11 years, booster shots and global vaccine equity. (2) Aim to get more linguistic representation—the South Asian community is very heterogenous (linguistically and culturally). Although we were able to include five primary languages, it would have been even more fruitful to include others, even those that are less frequently spoken in the GTHA.

Limitations of this programme include the small sample size and the biases (eg, recall, self-reporting and social desirability bias) associated with some of the questions asked in the pre-post surveys, as this was a small-scale community intervention without a control arm, which could potentially be scaled up if proven to be effective. Additionally, our convenience sample was not representative of the entire South Asian population in Canada. In particular, none of the participants self-identified as Muslim, Pakistani or Bengali, who make up a sizeable proportion of the South Asian population in Canada. Finally, due to the short timeline of the programme and to ensure a feasible workload for youth ambassadors, detailed participant data such as how many of the people they communicated with were unvaccinated and how many of them were able to get vaccinated were not collected. This made it difficult to assess the granularity of the programme's impact on vaccine uptake. The strengths of the study include the collaborative multisectoral partnerships, use of different avenues to curate key COVID-19 vaccine concerns and use of diverse dissemination strategies (eg, cross-promoting the products with support from other organisations while concurrently working more actively with youth ambassadors on tailored outreach).

CONCLUSION

The aforementioned learnings from this public health programme can be consolidated into a five-step circular roadmap: (1) developing collaborations with existing grass-roots South Asian organisations, local residents and project partners to codevelop goals and objectives; (2) building on those partnerships to curate key information needs/gaps; (3) creating the video narratives based on community priorities and cultural values (eg, altruism, multilingual preferences); (4) wide dissemination while keeping in mind non-traditional avenues such as 1:1 conversations and private messaging platforms like WhatsApp; and (5) evaluation of the process and products. These components exist in a circular pattern, which highlights that information needs change over time and need to be consistently reassessed (iterative assessments also help prioritise current evidence and public health recommendations/practices) (see [figure 1](#)).

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Contributors First coauthors SK, AA and JL conceptualised and designed the work with significant contributions from DA, LL, BM, EP, AS, AU, KMV, NCW and SSA. SK, AA and JL led the acquisition, analysis and interpretation of data. SK, AA, JL, DA, LL, BM, EP, AS, AU, KMV, NCW and SSA participated in drafting the work and revised it critically for important intellectual content. SK, AA, JL, DA, LL, BM, EP, AS, AU, KMV, NCW and SSA provided final approval of the version to be published and agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. SK, AA, and JL (guarantors) accept full responsibility for the finished work, the conduct of the study, had access to the data, and controlled the decision to publish.

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Competing interests None declared.

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Patient consent for publication Not applicable.

Ethics approval This study involves human participants and ethics approval was obtained from the Hamilton Integrated Research Ethics Board (HIREB; project ID: 133232) on 26 August 2021. It was approved as a substudy within a larger study, COVID COMMUNITY (South Asian), aiming to understand immune response and vaccine confidence within the South Asian communities of Ontario and British Columbia. All participants provided informed written consent electronically via the REDCap platform to participate in the SAY-VAC programme and for their data to be used in the programme evaluation.

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Data availability statement All data relevant to the study are included in the article or uploaded as supplementary information.

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