Drivers of COVID-19 Vaccine Intent Among Survivors of Adolescent and Young Adult Cancer: a Mixed Method Study

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Abstract

Background Survivors of adolescent and young adult (AYA) cancer are susceptible to severe COVID-19 outcomes due to their cancer history. Drivers of COVID-19 vaccine hesitancy and willingness are largely unexplored among AYA cancer survivors.

Methods We surveyed survivors of AYA cancer from October 2020–February 2021 who received services through an AYA cancer care program. Survey measures included vaccine hesitancy on a five-point Likert scale and an open-ended question on vaccine intent. Open-ended responses were content analyzed through two cycles of structured coding. Quantitative vaccine intent and qualitative drivers of intent were integrated during data analysis.

Results Of participants who responded to the open-ended vaccine intent question (N = 300), 39.0% reported COVID-19 vaccine hesitancy. Qualitative content analysis resulted in N = 517 codes and seven content categories. The most common content category associated with hesitancy included COVID-19 vaccine development, approval, and efficacy (34.5%; p value ≤ 0.001), as well as content areas including presence of misinformation about COVID-19 in the response (4.8%; p value = 0.04), the desire for more information about COVID-19/COVID-19 vaccine (6.0%; p value ≤ 0.001), and reference to political influence on participants’ intent to get the vaccine (2.5%; p value = 0.005). The most common category associated with vaccine willingness was personal perceptions of COVID-19 vaccination including protecting oneself and others (36.6% of codes; p value ≤ 0.001), followed by pro-vaccine beliefs (8.3%; p value ≤ 0.001) and trust in science (3.9%; p value ≤ 0.001).

Conclusions Common drivers of COVID-19 vaccine hesitancy among survivors of AYA cancer include concern about vaccine side effects and approval process, and misinformation. Cancer survivors COVID-19 vaccine uptake could be improved by focusing communication on drivers of willingness, motivational interviewing, and physician recommendations.

Keywords COVID-19 vaccine · Vaccine hesitancy · Vaccine willingness · Adolescent and young adult survivors

Background

As of January 2022, there have been over 62 million cases of the coronavirus disease 2019 (COVID-19) and nearly 850,000 deaths in the United States (US) alone.1 COVID-19 has disproportionately impacted vulnerable communities including the elderly,2 communities of color,3 and the medically vulnerable such as cancer survivors. Cancer survivors may have weakened immune systems due to cancer treatment, and are more likely to develop severe respiratory infections due to COVID-19 than the general population.4 The National Comprehensive Cancer Network (NCCN) and other leading cancer organizations recommend that cancer survivors receive the COVID-19 vaccine if they have no contraindications.5
Vaccination hesitancy, defined as delay in acceptance or refusal of vaccination despite availability, remains a barrier to protection against COVID-19 as roughly 20–40% of the U.S. population has reported hesitancy throughout vaccination efforts. Adolescent and young adult (AYA) cancer survivors, who are susceptible to severe COVID-19 due to their cancer history, experience suboptimal uptake of other vaccines, such as the HPV vaccine. We previously documented that 37.1% of survivors of AYA cancer reported COVID-19 vaccine hesitancy. Furthermore, young people have a high rate of COVID-19 transmission, which is particularly concerning as COVID-19 infection rates rise with the spread of more contagious COVID-19 variants. Documenting COVID-19 vaccine hesitancy trends is important to inform ongoing COVID-19 vaccination strategies for vaccine initiation and receipt of booster vaccinations.

We conducted a survey to document COVID-19 experiences with survivors of AYA cancer receiving care through an AYA cancer care program that serves the Mountain West region and is based in Utah. Using a mixed method approach, we identified, categorized, and analyzed patient-reported drivers for COVID-19 vaccine intent to understand the motivators and deterrents to COVID-19 vaccine receipt. Such information has the potential to inform provider, cancer center, and public health interventions for survivors of AYA cancer, particularly those in regions with high COVID-19 vaccine hesitancy.

Methods

Data Collection and Survey Domains

Eligible participants were ages 18 or older, diagnosed with cancer between 15 and 39 years of age, and had currently or previously received services through the Huntsman Intermountain Adolescent and Young Adult (HIAYA) Cancer Care Program. The HIAYA program provides programming and patient navigation to AYA cancer survivors in the Mountain West. HIAYA survivors were emailed a one-time survey on experiences during COVID-19 in October 2020. Follow-up emails, texts, and mail notifications occurred between October 2020 and January 2021.

Survey domains included sociodemographics, COVID-19-related factors (e.g., survey timing in relation to the announcement of a viable COVID-19 vaccine), as well as COVID-19 vaccination intent. Participants reported COVID-19 vaccine intent by first answering a five-point Likert scale ranging from strongly agree to strongly disagree on their likelihood of getting the COVID-19 vaccine if available and recommended. This item was collapsed to a binary outcome (willing to vaccinate = strongly agree to agree vs. hesitant to vaccinate = neutral to strongly disagree). Participants also answered a free response question asking the reason for their COVID-19 vaccine intent: “If available and recommended, why or why not would you get the COVID-19 vaccine?” Analyses were limited to individuals who responded to the free response question. Overall COVID-19 vaccine hesitancy and sociodemographic associations was previously published. All study activities were approved by the University of Utah Institutional Review Board (IRB#00091443).

Qualitative Content Analysis

COVID-19 vaccine free response answers were exported to Excel and analyzed using a qualitative content analysis consisting of two cycles of structured coding. First ARW and JSA immersed themselves in the data, took qualitative memos, and discussed initial insights with ELW. A coding structure was then constructed based on emergent categories. In first cycle coding, ARW and JSA coded 10% of the responses into the structure. Adjustments to the coding structure and category definitions were made by coder consensus and input from the tiebreaker/third coder (ELW). Second cycle coding began once the coding structure was finalized; ARW and JSA then double coded 20% of the responses into the structure to assess intercoder reliability. A Kappa statistic was calculated, $k = 0.81$, exceeding the threshold for high intercoder reliability ($k = 0.80$). All data were then coded into the structure. During the content analysis, to reduce coder bias, each free response was coded into the coding structure without knowledge of participants’ answer to the prior COVID-19 vaccine intent 5-point Likert question, unless free responses were too brief to interpret without such context.

Data Integration

Data collection followed a convergent mixed method study design as both qualitative and quantitative data were collected using the same instrument and were merged during an integration stage to enrich the description of the qualitative and quantitative results. Integration occurred during the data analysis phase using data transformation. Qualitative data from the content analysis were transformed into frequencies to represent drivers of COVID-19 vaccine intent. The unit of analysis was the number of mentions for each content area; thus, participants could mention multiple content areas. Qualitative data were transformed to facilitate statistical comparisons of reasons for intent with the collapsed Likert vaccine intent responses.

Quantitative Analysis

Sociodemographic differences by COVID-19 vaccine intent were calculated using chi-squared or Fisher’s exact tests.
Content analysis categories and content areas were compared with participants’ binary intent to receive the COVID-19 vaccine using chi-squared or Fisher’s exact tests where appropriate. All analyses were conducted using STATA 14. Statistical significance was preset at $p < 0.05$.

**Results**

Out of the total $N = 675$ eligible survivors, $N = 341$ completed the survey (50.5% participation rate); 88.0% of the survey sample ($N = 300$) answered the free response COVID-19 vaccine intent question and were included in this analysis. Participants that completed the free response item did not differ on age, race/ethnicity, or gender from participants who did not complete the item. Demographic summary statistics that characterize the analytic sample for this analysis are in Table 1.

COVID-19 vaccine hesitancy was reported by 39.0% of participants (data not shown). Statistically significant differences in demographics between the willing/hesitant groups include female participants were more likely to express vaccine hesitancy (44.0% females vs. 31.4% males, $p = 0.03$) and publicly insured survivors were more likely to express vaccine willingness (21.1% vs. 15.5%, overall $p$ for insurance $= 0.048$) than their hesitant counterparts. Although not statistically significant, the vaccine willing group tended to have higher education (college graduate or more 51.1% vs some college 40.1% vs high school education or less 8.8%, $p = 0.05$) compared to the hesitant group.

Qualitative content analysis resulted in $N = 517$ content codes across $N = 300$ (88.0%) survey participants. The median number of content codes within each participant’s written response was 2 (range $= 1–5$). We identified seven categories explaining vaccine intent. Definitions for each category are in Table 2. Frequencies for the content areas and statistical comparisons of intent to receive the COVID-19 vaccine are presented below, and in Table 3. Categories 6 and 7, work requirements (1.2%) and general uncertainty (1.0%), respectively, are not described below given their low prevalence.

**Category 1: Personal Perceptions of COVID-19 Vaccination**

This was the largest category, accounting for 36.6% of all content codes (189/517; Table 3). This category was broken down into four topics: first, protecting others (10.4%) represents the idea that it is important to protect other individuals from COVID-19. Second, protecting self (16.4%) represents explicit mentions of protecting oneself from COVID-19, both in general and due to cancer-related vulnerabilities. Third, respondents desired normalcy (4.1%), or returning to society as it was prior to COVID-19 (i.e., no masks or social distancing). Fourth, views that the COVID-19 vaccine lacked personal applicability (5.6%) because participants perceived their immune system was strong enough to

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**Table 1 Sociodemographic and COVID-19-related factors among survivors of adolescent and young adult (AYA) cancer ($N = 300$)**

| Category                               | N  | %  |
|----------------------------------------|----|----|
| Age at survey                          |    |    |
| 18-25 years                            | 111| 37.0|
| 26-55 years                            | 189| 63.0|
| Treatment status$^a$                   |    |    |
| Received treatment during pandemic     | 164| 55.2|
| Did not receive treatment during pandemic | 133| 44.8|
| Gender                                 |    |    |
| Male                                   | 118| 39.3|
| Female                                 | 182| 60.7|
| Education$^b$                          |    |    |
| College graduate or higher             | 139| 46.5|
| Some college                           | 125| 41.8|
| High school education or less          | 35 | 11.7|
| Race/Ethnicity                         |    |    |
| Non-Hispanic white                     | 243| 81.0|
| Hispanic White                         | 31 | 10.3|
| Non-Hispanic racial minority           | 26 | 8.7 |
| Living with children                   |    |    |
| Yes                                    | 97 | 32.3|
| No                                     | 203| 67.7|
| Essential worker$^c$                    |    |    |
| Essential worker, Health care          | 51 | 17.0|
| Essential worker, Non-health care      | 66 | 22.0|
| Not an essential worker                | 183| 61.0|
| Health insurance status at surveyc$^d$ |    |    |
| Private insurance                      | 226| 76.4|
| Public insurance                       | 56 | 18.9|
| Uninsured                              | 8  | 2.7 |
| Don’t know                             | 6  | 2.0 |
| Survey timing$^d$                      |    |    |
| Before Pfizer press release            | 220| 73.3|
| After Pfizer press release             | 80 | 26.7|
| Ever tested positive for COVID-19      |    |    |
| Yes                                    | 22 | 7.3 |
| No                                     | 278| 92.7|
| Positive COVID-19 test within social circle |    |    |
| Yes                                    | 144| 48.0|
| No/don’t know                          | 156| 52.0|

$^a$Missing $n = 3$

$^b$Missing $n = 1$

$^c$Missing $n = 4$

$^d$Participants flagged as survey completed before and after the Pfizer press release indicating COVID-19 vaccine efficacy and safety on November 09, 2020
fight off COVID-19 if infected or that they were not eligible for the vaccine due to an immunocompromised/suppressed status as a cancer survivor.

Overall personal perception codes were significantly more common among respondents who were willing to receive the COVID-19 vaccine than respondents who were hesitant \((p \text{ value} < 0.001; \text{Table 3})\). For each of the areas of feedback, significantly higher proportions of codes in the content areas of protecting others, protecting self, and desire for normalcy were present among respondents who were willing to receive the COVID-19 vaccine than those who were hesitant to vaccinate \((p \text{ values} < 0.001)\). Furthermore, a significantly higher proportion of codes about lack of personal applicability were present in the hesitant to vaccinate groups responses \((p \text{ value} < 0.001)\).
Table 3 Reasons for survivors of AYA cancer vaccine intent by willingness to receive the COVID-19 vaccine (N=517 codes)

| Category 1: Personal perceptions of COVID-19 vaccination | Total codes (N=517, 100%) | Codes by vaccine intent | p value |
|--------------------------------------------------------|---------------------------|------------------------|---------|
| Present                                                | 189 (36.6%)               | 163 (52.2%)            | 27 (13.2%) | <0.001 |
| Not present                                            | 328 (63.4%)               | 149 (47.8%)            | 178 (86.8%) | 
| Protecting others                                      |                           |                        |         |
| Yes                                                    | 54 (10.4%)                | 54 (17.3%)             | 0 (0)    | <0.001 |
| Not present                                            | 463 (89.6%)               | 254 (82.7%)            | 205 (100) | 
| Protecting self                                        |                           |                        |         |
| Yes                                                    | 85 (16.4%)                | 84 (26.9%)             | 1 (0.5)  | <0.001 |
| Not present                                            | 430 (83.6%)               | 228 (73.1%)            | 204 (99.5) | 
| Desire for normalcy                                    |                           |                        |         |
| Yes                                                    | 21 (4.1%)                 | 20 (6.4%)              | 1 (0.5)  | <0.001 |
| Not present                                            | 497 (95.8%)               | 292 (93.6%)            | 204 (99.5) | 
| Lack of personal applicability                         |                           |                        |         |
| Yes                                                    | 29 (5.6%)                 | 5 (1.6%)               | 24 (11.7) | <0.001 |
| Not present                                            | 488 (94.4%)               | 292 (93.6%)            | 204 (99.5) | 

Category 2: COVID-19 vaccine development, approval, and efficacy

| Present                                                | 179 (34.5%)               | 57 (18.3%)             | 122 (59.5%) | <0.001 |
| Not present                                            | 340 (65.5%)               | 255 (81.7%)            | 83 (40.5)   | 
| Vaccine: side effects, adverse reactions, efficacy     |                           |                        |         |
| Confidence                                             | 16 (3.1%)                 | 16 (5.1%)              | 0 (0)      | <0.001 |
| Concern                                                | 79 (15.2%)                | 17 (5.5%)              | 62 (30.2)  | 
| Not present                                            | 424 (81.7%)               | 279 (89.4%)            | 143 (69.8) | 
| Process: quickness and newness                         |                           |                        |         |
| Confidence                                             | 3 (0.6%)                  | 3 (1.0)                | 0 (0)      | <0.001 |
| Concern                                                | 50 (9.6%)                 | 15 (4.8)               | 35 (17.1)  | 
| Not present                                            | 466 (89.8%)               | 294 (94.3%)            | 170 (82.9) | 
| Want for more information                              |                           |                        |         |
| Yes                                                    | 31 (6.0%)                 | 6 (1.9)                | 25 (12.2)  | <0.001 |
| Not present                                            | 488 (94.0%)               | 306 (98.1)             | 180 (97.8) | 

Category 3: General vaccine beliefs and misinformation

| Present                                                | 79 (15.3%)               | 49 (15.7%)             | 30 (14.6)  | 0.74  |
| Not present                                            | 438 (84.7%)               | 263 (84.3%)            | 175 (85.4) | 
| General vaccine beliefs                                 |                           |                        |         |
| Pro-vaccine                                            | 43 (8.3%)                 | 40 (12.8%)             | 3 (1.5)    | <0.001 |
| Vaccine-hesitant/antivaccine                           | 11 (2.1%)                 | 1 (0.3)                | 10 (4.9)   | 
| Not present                                            | 463 (89.6%)               | 271 (86.9%)            | 192 (93.7) | 
| Misinformation                                         |                           |                        |         |
| Misinformation present                                 | 25 (4.8%)                 | 8 (2.7)                | 17 (8.3)   | 0.005 |
| Not present                                            | 492 (95.2%)               | 304 (97.3%)            | 188 (91.7) | 

Category 4: General trust in systems

| Present                                                | 42 (8.1%)                 | 22 (7.0)               | 20 (9.8)   | 0.26  |
| Not present                                            | 477 (91.9%)               | 292 (93.0)             | 185 (90.2) | 
| Trust in science                                       |                           |                        |         |
| Trust in science                                       | 20 (3.9%)                 | 18 (5.7)               | 2 (1.0)    | <0.001 |
| Distrust in science                                    | 9 (1.7%)                  | 1 (0.3)                | 8 (3.9)    | 
| Not present                                            | 490 (94.4%)               | 295 (94.0)             | 195 (95.1) |
Category 2: COVID-19 Vaccine Development, Approval, and Efficacy

The second most common category was COVID-19 vaccine development, approval, and efficacy (179/517; 34.5%). The first content area, vaccine side effects, adverse reactions, and efficacy, included participant expressions of concern (15.2%) or confidence (3.1%) about these topics. Notably, a nearly equal amount of concern and confidence about the vaccine’s side effects, adverse reactions, and efficacy (5.1% confidence vs. 5.5% concern) were reported by respondents who were willing to vaccinate. The second area of feedback focused on the vaccine approval process and the rapid development of a new vaccine. This content area was also broken down into content in which participants expressed either concern (9.6%) or confidence (0.6%).

There was a significantly higher portion of responses that include concern about vaccination in both of these content areas (vaccine side effects, adverse reactions, and efficacy as well as process: quickness and newness) reported by respondents who were hesitant to vaccinate compared to those who were willing to get a COVID-19 vaccine (p values ≤ 0.001; Table 3). Furthermore, want for more information, the last area, represented 6.0% of all codes and was more frequently reported by those who were hesitant to vaccinate (p value ≤ 0.001). Overall content areas within this category were more commonly reported by those in the vaccine-hesitant group (p value ≤ 0.001).

Category 3: General Vaccine Beliefs and Misinformation

General vaccine beliefs and misinformation (79/517; 15.3%) included beliefs about vaccines in general and general vaccine misinformation that influenced why participants did or did not want to receive the COVID-19 vaccine. Participant beliefs included being pro-vaccine (8.3%), and vaccine-hesitant/anti-vaccine (2.1%). There were significantly higher proportions of general pro-vaccine beliefs among those who agreed to vaccinate against COVID-19 and higher proportions of general vaccine anti-vaccine beliefs among those who were hesitant to vaccinate against COVID-19 (p value ≤ 0.001). The second area of feedback focused on misinformation (4.8%), which included any content reported that consisted of health information that is untrue or misleading as deemed by the authors based on best available evidence at the time of analysis. This content area included misinformation about cancer, vaccines, and COVID-19 in general and was significantly more common among respondents who were hesitant to vaccinate (p value = 0.005).
Category 4: General Trust in Systems

Content about trusting or distrusting systems was present in 8.1% (42/517) of codes. Content in this area included mentions of trusting the scientific process (3.9%) or calling into question the validity of scientific discovery in general (1.7%). Thus, there were higher proportions of trust in science codes reported by respondents who agreed to vaccinate and higher proportions of distrust in science codes reported by respondents who were hesitant to vaccinate ($p$ value < 0.001). The second content area included any mentions of political influence (2.5%) on participants’ vaccine intent. The proportion of political influence codes was significantly higher among respondents who were hesitant to vaccinate ($p$ value = 0.005).

Category 5: Physician Vaccine Recommendations

The fifth category, COVID-19 vaccine recommendations (22/517; 4.3%), consisted of explicit participant requests for a physician to individually recommend the COVID-19 vaccine. This category consisted of two areas of feedback, first wanting a physician recommendation in general (3.5%), and second wanting an oncologist recommendation (0.8%). Neither content area was associated with intent to receive the COVID-19 vaccine.

Discussion

Understanding COVID-19 vaccine intent among high-risk populations such as cancer survivors is of utmost importance. Our findings revealed that 38.9% of survivors of AYA cancer in our analytic sample reported COVID-19 vaccine hesitancy. Common drivers of vaccine hesitancy included concern about vaccine side effects, adverse reactions, and efficacy, as well as the quickness and newness of the vaccine. Further hesitancy was driven by distrust in systems, misinformation, and a perceived lack of personal applicability. Primary drivers of willingness to get the COVID-19 vaccine included protecting oneself and others from the virus as well as a desire for normalcy, trust in science, and pro-vaccine beliefs.

Despite having safe and effective vaccines against COVID-19, a substantial proportion of the US population remains hesitant. The reasons for COVID-19 vaccine hesitancy that emerged from the content analysis largely align with COVID-19 vaccine hesitancy studies conducted in the general population. One of the more commonly mentioned reasons for vaccine hesitancy among survivors of AYA cancer was not perceiving the vaccine as applicable to them. Participants referenced active cancer treatment and immune system suppression as further reasons for hesitancy, beyond not being at risk for COVID-19, even though this perception is not supported by current evidence. Multiple cancer organizations recommend that patients on active treatment receive the COVID-19 vaccine, with the exception of patients receiving bone marrow transplant or CAR T-cell therapy, who should wait at least three months after treatment ends. Furthermore, preventing COVID-19 infection among all survivors is equally important as for those who experience immunosuppression, as the long-term health impacts of COVID-19 begin to be observed (e.g., prolonged fatigue, headaches, and concentration or memory issues).

We also reported a wide variety of drivers among those willing to receive the COVID-19 vaccine. The most frequently mentioned facilitator was their personal perceptions or how receiving the COVID-19 vaccine would impact themselves and others (i.e., content areas focusing on protecting themselves and protecting others), similar to the general population. Public health messaging could improve penetration among cancer survivors by including language focused on receiving the COVID-19 vaccine to not only protect oneself but to protect others and move towards normalcy. Further vaccine campaigns could focus on building hesitant individuals’ sense of responsibility to protect others as more highly contagious COVID-19 variants threaten unvaccinated populations and the importance of booster vaccinations among the immunocompromised/suppressed grows.

Consistent with the general population, worries about side effects, adverse reactions, efficacy, and the overall approval process of the COVID-19 vaccine were reported by our participants, and are common concerns reported by cancer survivors and their caregivers as reasons for other vaccine hesitancy prior to the COVID-19 pandemic. Additionally, content areas such as trust in science and pro-vaccine beliefs were also associated with willingness to vaccinate which is consistent with emerging studies on the political divide of COVID-19 vaccine willingness. However, categories that were significantly associated with hesitancy such as concern about side effects, adverse reactions, and efficacy and misinformation, while not as common among the agree to vaccinate group, were present in the content reported by those who were willing to receive the COVID-19 vaccine. Suggesting that, even if an individual exhibits intent to receive the vaccine, they may continue to require information and reassurance about the vaccine. Intent to vaccinate is multifaceted should not be falsely equated with the behavior of vaccine receipt. Future investigation of COVID-19 vaccine intent vs. receipt and efforts to increase COVID-19 vaccine/booster uptake among those exhibiting hesitancy should utilize health behavior change and equity focused models.

Our findings and that of others suggest that having a history of cancer influences survivors’ intent to receive the COVID-19 vaccine and may require specific intervention.
While some are hesitant due to lack of personal applicability, others are willing because they desire to protect themselves because of their cancer history. Cancer survivors who are hesitant may be receptive to educational intervention as want for more information was significantly associated with hesitancy in our sample. This may indicate that many survivors who are hesitant to vaccinate may be persuaded if high quality, cancer-specific, information is provided to them by a trusted source. Young survivors may benefit from specific COVID-19 vaccine recommendations from their oncology care providers as oncology provider recommendations for other vaccines are the primary driver of uptake for other vaccines among pediatric and AYA survivors.

Oncology care providers may have influence on survivors’ vaccination intent given their trusted relationships. This relationship could be leveraged to recommend COVID-19 vaccines through motivational interviewing. Motivational interviewing may allow for a more balanced discussion about the importance for cancer survivors to be vaccinated rather than solely providing information on COVID-19 vaccination. In fact, solely providing information may increase hesitancy, while taking a motivational interviewing approach allows providers to identify individual motivators and deterrents and provide advice, information, and resources according to the individuals concerns about the vaccine. Our findings support this approach because even those who reported willingness to receive the COVID-19 vaccine expressed concerns about side effects, adverse reactions, efficacy, and the approval process. Understanding that COVID-19 vaccine intent is multifaceted and that individuals fall into a spectrum of hesitancy and willingness is crucial when developing COVID-19 vaccine interventions to improve initial series and booster vaccine uptake, particularly among vulnerable populations, like survivors of AYA cancer.

Limitations

The sample of the study is largely non-Hispanic White, highly educated, and lives in the Mountain West which may not reflect the COVID-19 vaccine intent of other regions with greater socioeconomic and racial/ethnic diversity. However, the demographics and political affiliations of Utahns mirror many other areas of the country with low COVID-19 vaccination rates, highlighting the generalizability of our findings to other regions with high hesitancy. While there were no demographic differences between non-responders, the 12% of participants who did not respond to the open-ended questions may have different vaccine intentions than those who responded. Furthermore, specificity may have been lost when categorizing hesitancy as a binary variable; future inquiry could further explore nuances within the COVID-19 vaccine-hesitant group. Our survey was partially conducted prior to FDA approval of a COVID-19 vaccine. Furthermore, the study concluded prior to the recommendation for booster COVID-19 vaccines among immunocompromised-suppressed individuals, so more research is needed to document reasons for COVID-19 vaccine hesitancy (initial and booster) among survivors of AYA cancer.

Conclusion

COVID-19 vaccine hesitancy was high among survivors of AYA cancer. Drivers of hesitancy largely mirror the general population but include some specific concerns related to participants cancer histories and lack of a provider recommendation. Our findings suggest that a survivor’s vaccine hesitancy may be modifiable with high quality information from a trusted source. At the same time, drivers of vaccine willingness commonly revolved around protecting oneself and others as well as a desire for normalcy. Future COVID-19 vaccine interventions to increase uptake of the initial series and booster shots among survivors of AYA cancer could benefit from acknowledging the complexity of vaccine intent and utilizing motivational interviewing and oncology provider recommendations.

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Declarations

Conflict of Interest The authors declare no competing interests.

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