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PSYCHOSOCIAL AND SUPPORTIVE CARE: RESEARCH ARTICLE

# Factors affecting COVID-19 vaccine hesitancy in parents of children with cancer

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## Abstract

**Aim:** Little research exists on coronavirus (COVID-19) vaccine hesitancy among caregivers of children with cancer. We aimed to (a) describe vaccine hesitancy in parents of children with cancer for both their child and self, and (b) examine the mediating role of parent-reported COVID impact on the association between COVID exposure and vaccine hesitancy.

**Procedure:** We conducted a national survey of parents of children with cancer via Facebook and Momcology, a pediatric cancer community-based organization recruited February–May 2021. Parents completed standardized measures online. A series of mediation models assessed the role of COVID-19 impact (e.g., effects on parenting and well-being) on associations between COVID-19 exposure (e.g., direct/indirect exposure) and vaccine hesitancy. Moderation models examined the role of treatment status, COVID-19 exposure, impact, and vaccine hesitancy.

**Results:** Parents ($n = 491$; 90% mothers; 93% White) reported moderate vaccine hesitancy ($M = 2.08$, SD = 0.76). Specifically, 18.5% ($n = 90$) reported they would not vaccinate their child, and 24.4% ($n = 119$) would only consider vaccination. Parents expressed higher concerns about vaccine side effects for their children ($M = 3.01$, SD = 0.95) than for themselves ($M = 2.61$, SD = 1.03; $t[479] = 9.07$, $p < .01$). Mediation analysis revealed a significant indirect effect of impact (95% CI [−0.013, −0.001]) on the association between higher exposure and higher vaccine hesitancy ($b = .02$, $p = .06$). There was no moderating effect of treatment status. Income remained a significant covariate ($b = -.11$, $p < .01$).

**Conclusion:** Lower parent-reported COVID exposure, higher COVID impact, concern for side effects, and lower income may be important factors related to vaccine hesitancy among parents of children with cancer. Providers of childhood cancer survivors should address vaccine hesitancy and potential health risks.

KEYWORDS
childhood cancer, COVID-19, vaccine hesitancy

**Abbreviations:** CEFIS, COVID-19 Exposure and Family Impact Scale; COVID-19, coronavirus; VHS, Vaccine Hesitancy Scale.

## 1 | INTRODUCTION

The novel coronavirus (COVID-19) global pandemic began in early 2020 and has caused almost one million deaths in the United States.[1] Children, in general, have had lower rates of medical complications due to the illness; however, pediatric cancer patients may be more vulnerable to COVID-19 infection, with high viral loads, weeks of virus shedding,[2] and increased risk for severe or fatal COVID-19 infection.[3,4] Furthermore, children with cancer and their parents may experience even greater psychological distress and social isolation as a result of the pandemic.[5–7]

COVID-19 vaccines have been recommended for individuals with cancer, including children over the age of 12, to prevent potential infection.[8–10] COVID-19 vaccines could dramatically reduce not only the physical effects of infection, but also the marked social impact of the pandemic for children. For example, school closures due to COVID-19 affected more than 57 million children and worsened achievement gaps and food insecurity.[11,12] Pediatric COVID-19 vaccination could also restore extracurricular activities that have substantial benefits for children, such as increased physical activity and peer interaction. Thus, widespread vaccination could drastically reduce the need for public safety measures that have compounded the psychosocial impact of cancer treatment (e.g., isolation, school absences) on children.

Despite the potential benefits, COVID-19 vaccine hesitancy continues to be a major threat to the successful implementation of vaccination. Vaccine hesitancy is defined as the delay in acceptance, reluctance, or refusal of vaccination[13,14] and was designated by the World Health Organization as a top 10 leading threat to global health prior to the COVID-19 pandemic.[15] Specific to cancer and COVID-19, a recent survey reported 30% of adults with cancer were unsure or had no intent to receive the COVID-19 vaccine.[16] The most common reason for vaccine hesitancy was fear of side effects. For those willing to receive the vaccine, the strongest predictors included vaccination of family and friends and physician recommendation. Parents have expressed vaccine hesitancy related to influenza and other routine childhood vaccinations,[15] with one in eight expressing concern related to vaccine safety. Determining the degree of vaccine hesitancy and distinguishing other reasons for under-vaccination is essential to develop interventions that address substandard vaccine uptake.[14]

To our knowledge, little is known about COVID-19 vaccine hesitancy in parents of children with cancer or factors influencing uptake. Thus, we describe the degree of COVID-19 vaccine hesitancy among parents of children with cancer and examined a number of variables (e.g., demographic factors, treatment status, and COVID-19 exposure, impact, and distress) potentially related to vaccine hesitancy. We expected less vaccine hesitancy in parents of children who were older, had higher income, were on therapy, and with greater COVID-19 exposure and impact. Results will inform the development of targeted interventions to increase COVID-19 vaccination rates and mitigate sequela of potential COVID-19 infection in this vulnerable population of children.

## 2 | METHODS

This paper presents a cross-sectional analysis of COVID-19 vaccine hesitancy among US parents of children with cancer. Institutional review board approval was obtained, and eligibility included parents of children (a) 0–18 years of age, (b) with a current or previous cancer diagnosis, and (c) English speaking. Consent was implied by completion of the anonymous survey.

### 2.1 | Recruitment

Families were recruited in partnership with Momcology, a nonprofit pediatric cancer community-based organization and using a pay per click Facebook ad campaign. Momcology.org participates in community-engagement efforts to connect parents to IRB-approved research studies that will benefit the needs of its community.[17] Recruitment occurred from February 2021 until May 2021 and ended prior to approval of the vaccine in adolescents greater than 16 years of age. The Facebook ad included a black and white picture of a child with cancer (Supporting File S1). Parents utilized a hyperlink to complete a four-item yes/no eligibility screening questionnaire that included (a) English fluency, (b) child with cancer diagnosis, (c) child age 0–18 years, and (d) willingness to participate. Eligible parents were then directed to complete electronic measures via REDCap. Previous research has shown online and mail surveys produce equivalent results.[18,19]

### 2.2 | Measures

#### 2.2.1 | Demographic characteristics

Data were collected from the parent about themselves and partner (if applicable), including number of children (with ages), sex, race, ethnicity, marital status, geographic location, income, employment status, and occupation. Parents were also asked about the participating child's age, grade, sex, race, ethnicity, diagnosis, age at diagnosis, and treatment.

#### 2.2.2 | COVID-19 Exposure and Family Impact Scale (CEFIS)

This standardized measure assessed the exposure to COVID-19-related events and the impact of the pandemic on families. It was created using a rapid iterative process by members of the Center for Pediatric Traumatic Stress.[20] Part 1 of CEFIS consists of 25 yes/no responses measuring *exposure* to COVID-19 and events such as school closures, stay-at-home orders, changes in employment, and missing family functions. A total exposure score is generated on a scale of 0–25. Within our sample, the exposure scale had a Cronbach's alpha of .72. Part 2 comprised 12 items measuring the *impact* of COVID-19, such as effects on parenting, ability to care for children, and physical well-being. Ten items were rated on a five-point Likert scale (modified from the original four points to include *no change)* indicating the degree to which COVID-19 affected each area. Two additional items assessed parental and child distress on a 10-point scale. Higher scores indicate a more negative impact. Within our sample, the impact scale had a Cronbach's alpha of .82. In previous literature, the Cronbach's alpha for the exposure scale was .80 and .92 for the impact scale.[20]

### 2.2.3 | Vaccine Hesitancy Scale (VHS) Questionnaire

This questionnaire was a modified version of a vaccine hesitancy questionnaire originally adapted from the World Health Organization Vaccine Hesitancy Survey.[15] The VHS survey is psychometrically validated and comprised 10 items, including dimensions of vaccine confidence and vaccine risks.[21] The modified version includes eight items and rated on a four-point Likert scale rather than a five-point response scale due to removal of the "neutral" option given evidence that omitting the "neutral" option decreases the potential for socially desirable responding.[22] The wording was further modified to assess parent beliefs regarding COVID-19 vaccination for their child rather than general childhood or influenza vaccines. Parents' responses to each of the eight items were averaged to calculate a composite VHS score. The two questions asking about concern for side effects were reverse scored. Lower scores reflect greater vaccine hesitancy. The Cronbach's alpha for our sample was .93.

## 2.3 | Statistical analysis

Data were analyzed using SPSS software, version 26 for Windows. Descriptive statistics (*M*, SD, frequencies) were calculated for demographic characteristics and primary variables of interest. To identify potential covariates prior to running multivariate models, Pearson ($\alpha = .05$; two-way) correlations were conducted between primary dependent variables (i.e., vaccine hesitancy) and demographic factors (e.g., parent age, parent sex, prior income, child age at diagnosis, treatment status). Pearson correlations were also used to examine associations between primary dependent variables (i.e., vaccine hesitancy) and COVID-19 exposure and COVID-19 impact scores.

The PROCESS macro for SPSS was used to conduct moderated mediation analysis using ordinary least squares regression in four separate models.[23] Based on bivariate correlations, parent age, parent sex, child age at diagnosis, and prior family income were controlled for in each model where COVID-19 exposure was the primary independent variable, COVID-19 impact was the mediator, and vaccine hesitancy was the outcome; then, treatment status was tested as a potential moderator of the association between COVID-19 impact and vaccine hesitancy. Indirect effects were assessed using 95% bias-corrected confidence intervals based on 10,000 bootstrap samples; the effect was considered significant when confidence intervals did not contain zero. Thereafter, conditional indirect effects of exposure on vaccine hesitancy were examined through the mediator, followed by second-stage moderation. A simple mediation analysis was conducted when the moderator was nonsignificant.

**TABLE 1** Parent demographic characteristics (*N* = 491)

| | Mean (SD) or *n* (%) |
|---|---|
| Parent age in years (SD) | 38.79 (6.85) |
| Sex | |
| Male | 51 (10.5%) |
| Female | 436 (89.5%) |
| Race | |
| White | 454 (92.5%) |
| Non-White | 37 (7.5%) |
| Ethnicity | |
| Hispanic | 39 (8.0%) |
| Non-Hispanic | 450 (92.0%) |
| Years of education (SD) | 14.43 (4.69) |
| Income | |
| <$25,000 | 18 (3.7%) |
| $25,001–$50,000 | 92 (18.9%) |
| $25,001–$75,000 | 96 (19.8%) |
| $75,001–$100,000 | 81 (16.7%) |
| $100,001–$150,000 | 108 (22.2%) |
| >$150,000 | 90 (18.5%) |
| Other | 1 (0.2%) |
| Current employment status | |
| Working full-time (>30 hours/week) | 234 (47.9%) |
| Working part-time (<30 hours/week) | 99 (20.2%) |
| Unemployed | 156 (31.9%) |
| Region of residence (USA) | |
| West | 79 (16.4%) |
| Midwest | 147 (30.5%) |
| South | 173 (35.9%) |
| Northeast | 76 (15.8%) |
| Outside the USA | 7 (1.5%) |

# 3 | RESULTS

## 3.1 | Sample characteristics

The sample included 491 parents who completed self-report and proxy report on their child with cancer (Table 1). On average, parents were 38.79 years old (SD = 6.85), and most participants were mothers (90%,

**TABLE 2** Child demographic characteristics ($N = 491$)

| | Mean (SD) or *n* (%) |
|---|---|
| Child age in years (SD) | 9.16 (4.26) |
| Child age at diagnosis (SD) | 5.69 (4.02) |
| Sex | |
| Male | 257 (52.6%) |
| Female | 232 (47.4%) |
| Race | |
| White | 457 (93.1%) |
| Non-White | 34 (6.9%) |
| Ethnicity | |
| Hispanic | 49 (10.1%) |
| Non-Hispanic | 438 (89.9%) |
| Primary diagnosis | |
| Acute lymphoblastic leukemia (ALL) | 193 (39.3%) |
| Acute myeloid leukemia (AML) | 33 (6.7%) |
| Brain tumor | 65 (13.2%) |
| Ewings sarcoma | 25 (5.1%) |
| Osteosarcoma | 13 (2.6%) |
| Wilms tumor | 22 (4.5%) |
| Neuroblastoma | 49 (10.0%) |
| Liver tumor (hepatoblastoma) | 14 (2.9%) |
| Lymphoma | 26 (5.3%) |
| Retinoblastoma | 7 (1.4%) |
| Other | 44 (9.0%) |
| Current treatment status | |
| Active treatment | 119 (24.2%) |
| Maintenance treatment | 133 (27.1%) |
| Palliative treatment | 18 (3.7%) |
| Survivorship/off treatment | 221 (45.0%) |
| Type of treatment | |
| Inpatient chemotherapy | 134 (27.3%) |
| Outpatient chemotherapy | 106 (21.6%) |
| Both inpatient and outpatient chemotherapy | 250 (50.9%) |
| Oral agent only | 32 (6.5%) |
| Radiation | 121 (24.6%) |
| Bone marrow transplant | 75 (15.3%) |
| Surgical resection | 119 (24.2%) |

$n = 436$) and White (93%, $n = 454$). Parents averaged 14.4 years of education (SD = 4.69), and approximately 41% ($n = 198$) reported a pre-COVID income greater than $100,000. Over half of parents reported living in the Midwestern (31%, $n = 147$) or Southern (36%, $n = 173$) regions of the United States. The sample of children was 47% female ($n = 232$), with a mean age of 9.16 years (SD = 4.26) (Table 2). The average age at cancer diagnosis was 5.69 (SD = 4.02), and 45% of children were off-treatment ($n = 221$) at the time of study.

## 3.2 | COVID-19 exposure and impact

On a scale of 0–25, the overall mean COVID-19 exposure score was 8.86 (SD = 3.45). The most frequently reported COVID-19 exposure events were indirect, including closure of schools and daycares (92%, $n = 451$), a stay-at-home order (91.4%, $n = 449$), missing an important family function (81.4%, $n = 399$), disruption to children's education (78%, $n = 380$), and inability to visit or care for a family member (76%, $n = 371$). Approximately 52% ($n = 257$) of the sample reported a decrease in family income, and 50% ($n = 246$) of families reported a family member had to cut back hours at work. Only 24% ($n = 118$) of the sample had direct exposure to COVID-19 due to a family member's symptoms or diagnosis, and 3.7% ($n = 18$) reported a COVID-19-related death in the family. The average COVID-19 impact score was 42.84 (SD = 6.95) on a scale of 0–60, which reflected moderately negative effects on aspects like parenting, ability to care for children, and physical well-being.

## 3.3 | Vaccine hesitancy

The average vaccine hesitancy score among this sample was 2.92 (SD = 0.76) on a scale of 1–4 (1: not likely, 2: will consider, 3: very likely, 4: will vaccinate), reflecting low to moderate hesitancy. Figure 1 describes responses to individual items related to vaccine hesitancy. About half (52.8%, $n = 257$) of parents were very likely to or would vaccinate their child with cancer. In contrast, 18.5% ($n = 90$) reported they would not vaccinate their child, and 24.4% ($n = 119$) would only consider vaccination. Parents were more likely to vaccinate themselves, with 55.8% ($n = 274$) indicating they would consider receiving the vaccine, and 16.7% ($n = 81$) likely to vaccinate. Parents expressed significantly greater concerns about vaccine side effects for their children ($M = 3.01$, SD = 0.95) than for themselves ($M = 2.61$, SD = 1.03; $t[479] = 9.07$, $p < .01$).

## 3.4 | Factors associated with vaccine hesitancy and treatment status

Table 3 includes correlations between demographic factors and variables of interest. Greater vaccine hesitancy was associated with younger parent age ($r = -.24$, $p < .01$), male parent sex ($r = -.14$, $p < .01$), and lower prior income ($r = -.30$, $p < .01$). Greater vaccine hesitancy was also significantly correlated with younger child age at diagnosis ($r = -.09$, $p = .049$) and being on treatment ($r = .13$, $p < .01$). Parents who reported greater vaccine hesitancy had higher COVID-19 exposure scores ($r = .13$, $p < .01$) and lower COVID-19 impact scores

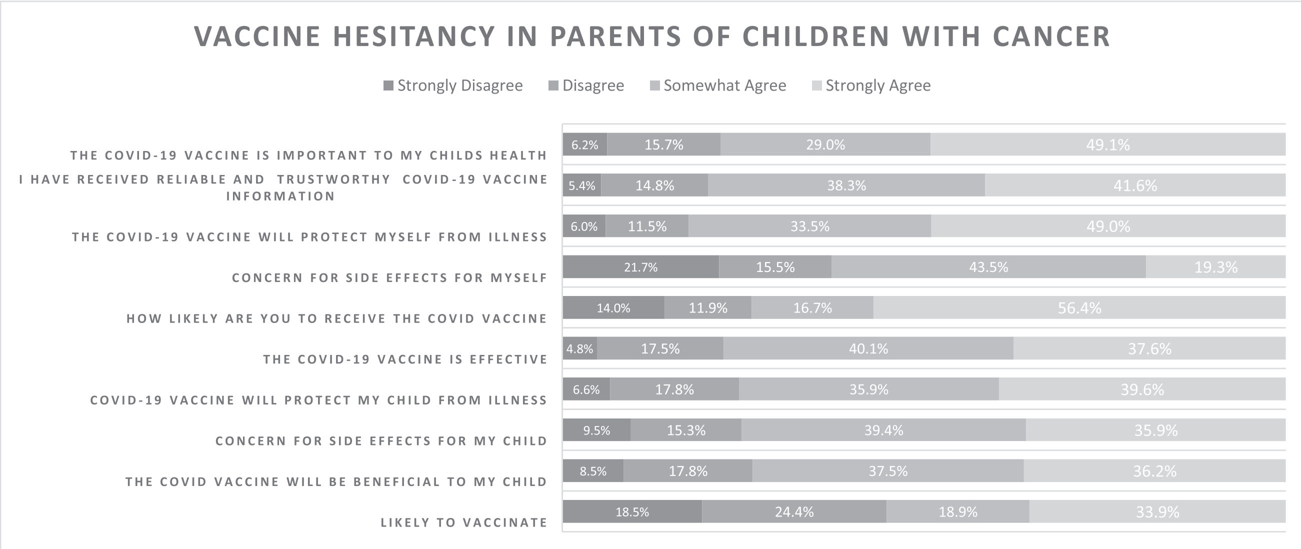


**FIGURE 1** Vaccine hesitancy responses in parents of children with cancer

**TABLE 3** Correlations between demographic characteristics and vaccine hesitancy

| Variable | 1. | 2. | 3. | 4. | 5. | 6. | 7. | 8. |
|---|---|---|---|---|---|---|---|---|
| 1. Vaccine hesitancy | | | | | | | | |
| 2. COVID-19 exposure | .13** | | | | | | | |
| 3. COVID-19 impact | −.12* | .22** | | | | | | |
| 4. Parent sex | −.14** | .08 | .23** | | | | | |
| 5. Parent age | −.24** | −.12** | .12* | .22** | | | | |
| 6. Prior income | −.30** | −.22** | −.01 | .10* | .32** | | | |
| 7. Child age | −.06 | −.04 | −.03 | −.03 | .55** | .11* | | |
| 8. Age at diagnosis (child) | −.09* | −.05 | −.01 | −.10* | .30** | .12** | .70** | |
| 9. Treatment status | .13** | −.02 | .01 | −.24** | −.32** | −.11* | −.20** | .17** |

*$p < .05$
**$p < .01$.

($r = -.11$, $p = .02$). Geographically, parents who lived in the Southern region of the United States reported greater vaccine hesitancy ($r = .15$, $p < .001$), whereas parents who lived in the Western region of the United States reported lower vaccine hesitancy ($r = -.11$, $p = .01$). While correlations with parent age and income were moderate sized, the remaining associations were relatively weak.

## 3.5 | Indirect effect of COVID-19 impact on COVID-19 exposure and vaccine hesitancy

While controlling for parent age, parent sex, prior family income, and child's age at diagnosis, mediation analysis revealed a significant indirect effect of COVID-19 impact (95% CI [−.013, −.001]) on the association between COVID-19 exposure and vaccine hesitancy ($c' = .02$, $p = .06$; see Figure 2). The model including COVID-19 impact accounted for 13% of the variance in vaccine hesitancy ($F = 9.56$,

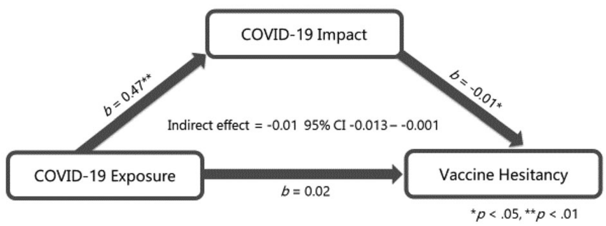


**FIGURE 2** Vaccine hesitancy mediation model. *R*-squared for the model: .13; this model controls for parent age, parent sex, child's age at diagnosis, and prior family income, of which income was significantly correlated with vaccine hesitancy

$p < .01$). Income remained a significant covariate in the final model ($b = -.11$, $p < .01$), where higher income was associated with less vaccine hesitancy. Higher COVID-19 exposure was associated with greater COVID-19 impact ($a = .47$, $p < .01$), which was then associated with less vaccine hesitancy ($b = -.01$, $p = .03$). However, there was no moderating effect of treatment status on the indirect path.

## 4 DISCUSSION

In this nationwide study, US parents of children with cancer had moderate levels of COVID-19 vaccine hesitancy. Parents were more likely to report an intention to vaccinate themselves than their child, and they also reported less concern about side effects for themselves than for their child. Additional correlates of vaccine hesitancy included younger parent age, male parent sex, lower income, the child being off-treatment, lower parent-reported COVID-19 exposure, and higher COVID-19 impact. In multivariate models, greater COVID-19 impact mediated the association between higher COVID-19 exposure and less vaccine hesitancy regardless of the child's treatment status. However, the final model only explained a small portion (13%) of the variation in overall vaccine hesitancy.

While few studies have reported COVID-19 vaccine hesitancy rates specifically in parents of children with cancer, hesitancy rates in this cohort were twice as high as the previously reported rate of 19% in adults with comorbid conditions, including cancer.[24] Rates from our study were also higher than the previously reported rate of 37.1% in adolescent and young adult cancer survivors.[25] COVID-19 vaccine hesitancy rates in the general population range from 25% to 53%.[26–28] This suggests parents of children with cancer may have comparable to slightly more vaccine hesitancy than other populations. COVID-19 vaccine hesitancy rates are almost double to that of influenza vaccine hesitancy rates previously reported in children.[15,29] Interestingly, parents were more hesitant to vaccinate their child than themselves. This is likely due to the unknown side effects of the COVID-19 vaccine in children.

Despite numerous studies that refute long-term, adverse effects of vaccinations, adverse effects and safety concerns remain the largest determinants of whether or not parents vaccinate their children.[15,30] In this study, most parents expressed concern about the potential side effects of the vaccine for both their child and themselves. A recent study utilizing a provider-delivered webinar demonstrated increased COVID-19 vaccine enthusiasm in adults with cancer.[16] This strongly supports the need for timely, accurate information regarding the short-term risks and the long-term benefits of the COVID-19 vaccination from healthcare providers.

Parents of children with cancer who have completed treatment reported lower COVID-19 impact scores and lower vaccine hesitancy in our study. This supports literature identifying unique risks for childhood cancer survivors[5,31] and a recent study reporting childhood cancer survivors feel at higher risk of severe COVID-19-related complications.[32] Additionally, childhood cancer survivors report worse anxiety, depression, and posttraumatic stress at present than before the pandemic.[32] This worsening of mental health could be due, in part, to the social isolation and fear of uncertainty if infected. Vaccination could be an important way to alleviate both physical and mental health concerns and potentially improve overall health. In contrast, given the increased hesitancy among patients receiving treatment, close attention by oncology providers in giving timely and accurate information regarding COVID-19 vaccination to parents may be the key to increasing vaccine acceptance in children with cancer, who are receiving therapy.

While overall vaccine hesitancy in parents of children with cancer is moderate, every effort should be made to develop interventions to improve vaccine acceptance. Behavioral science could inform the development of diverse and feasible approaches to bolstering COVID-19 vaccination rates.[33] Hallsworth and colleagues reported that two sentences emphasizing a concern for family and friends (i.e., "Your loved ones need you. Get the COVID-19 vaccine to make sure you can be there for them.") increased willingness to vaccinate in a US randomized trial.[34] Those researchers found other beneficial messages based upon (a) approval by healthcare workers (i.e., "Doctors and nurses have decided to get the COVID-19 vaccine. Now, they recommend that you do too. Talk to your doctor to find out more about why it's right for you."); (b) a desire for normality (i.e., "Now we have the chance to return to the people and places we love. Let's get back our lives back again. Sign up to get the COVID-19 vaccine."); and (c) social norms (i.e., "The COVID-19 vaccine was tested with 70,000 people. Now, more than 14 million people have gotten it. When it's your turn, you can feel confident that it is safe and effective"). In the United Kingdom, Freeman and colleagues found that a message emphasizing the personal versus societal benefits of COVID-19 vaccines decreased hesitancy among those strongly resistant to vaccination.[35] While none of this research focused on families of youths with cancer, pediatric oncology providers and organizations could base future communication strategies on such evidence-based messages.

To our knowledge, this is one of first studies to examine vaccine hesitancy in parents of children with cancer; however, this study should be considered in the context of several limitations. First, the use of social media for recruitment through a community-based organization is not without criticism, as it could introduce ascertainment bias and restricts participation of parents without social media access. More specifically, the community organization is specific to mothers and could bias the sample in that manner. Parents were primarily White, non-Hispanic mothers. Continued research is needed to understand the development and resolution of vaccine hesitancy in unique populations, who are vulnerable to infection and negative outcomes from COVID-19. Inclusion of diverse families who may have additional challenges due to health disparities, such as higher rates of COVID-19 infection and mortality, greater COVID-related impact, and less access to the vaccine is important. Information regarding vaccine hesitancy in healthy siblings was not collected, thus the degree to which the child's cancer diagnosis influenced hesitancy is not known. Thus, research should focus on how decisions about vaccinations are shared by multiple caregivers and the child to best incorporate a family-centered approach to vaccine messaging. This study took place in the early days of vaccination, and the vaccine was not approved for children or adolescents at the time of our study. Vaccine hesitancy may decrease as approval for younger ages is achieved and as time from vaccination increases with few adverse reactions.

## 5 | CONCLUSION

Our results may inform targeted interventions to increase COVID-19 vaccination rates in children with cancer. Although the clinical development of COVID-19 vaccines has progressed at rapid speed, an unadministered vaccine dose does not provide benefit. Public vaccination acceptance is closely associated with vaccination confidence and hesitancy. Decreasing hesitancy rates in parents of children with cancer, with special attention to those of lower income, off-treatment, and higher COVID-19 impact, is needed to ensure all children with cancer are protected. Oncology providers are encouraged to offer COVID-specific education and messaging about the vaccine, which has been shown to be effective in other research. Helping families gain direct access to vaccines at the treating hospital or in their communities may also help.

## AUTHOR CONTRIBUTIONS

Micah A. Skeens conceptualized and designed the study, designed the data collection instruments, collected data, drafted the initial manuscript, and reviewed and revised the manuscript. Cynthia A. Gerhardt assisted with design of the study and data collection instruments, drafted initial manuscript, and reviewed and revised the manuscript. Kylie Hill and Anna Olsavsky carried out the initial analyses and reviewed and revised the manuscript. Terrah Foster Akard assisted with methodology, reviewed and revised the manuscript, and critically reviewed the manuscript for important intellectual content. Kimberly Buff assisted with methodology, and reviewed and revised the manuscript. Jack Stevens, Nilay Shah, and Terrah Foster Akard reviewed and revised the manuscript and critically reviewed the manuscript for important intellectual content. All authors approved the final version of the manuscript as submitted and agree to be accountable for all aspects of the work.

### DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

### CONFLICT OF INTEREST

The authors report no conflicts of interest or relevant financial relationships.

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## SUPPORTING INFORMATION

Additional supporting information may be found in the online version of the article at the publisher's website.

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