Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

COVID-19 Pediatric Vaccination Attitudes Among Parents in Ohio

Carol Schaumleffel, DNP, RN, LSN,
Christy Vickers, DNP, APRN, CPNP, &
Ilana Azulay Chertok, PhD, MSN, RN, IBCLC

Introduction: This study aimed to examine factors associated with parental intention to vaccinate children against COVID-19 in Ohio following pediatric vaccine approval in October 2021.
Method: Online anonymous surveys were distributed between November 2021 and January 2022 to parents in Ohio.
Results: Surveys were completed by 581 parents of whom 43.5% reported they intended to vaccinate their children against COVID-19, whereas 56.5% did not intend to vaccinate their children. Perceiving a lack of support by health care providers was significantly associated with not intending to vaccinate children against COVID-19 ($p < .001$).
Discussion: Survey results from parents in Ohio indicate that perceived health care provider support and parents' attitudes about pediatric COVID-19 vaccination influenced their intent to vaccinate their children. Hence, health care providers working with families need to focus on educating parents regarding the importance and safety of vaccination. J Pediatr Health Care. (2022) *36*, e1−e6

Carol Schaumleffel, Assistant Professor of Nursing, College of Health Sciences and Professions, Ohio University, Athens, OH

Christy Vickers, Associate Professor of Nursing, College of Health Sciences and Professions, Ohio University, Athens, OH

Ilana Azulay Chertok, Professor, Associate Director of Nursing Research and Scholarship, College of Health Sciences and Professions, Ohio University, Athens, OH

This study was approved by Ohio University Institutional Review Board (IRB no. 21-X-142).

Conflicts of interest: None to report.

Correspondence: Carol Schaumleffel, DNP, RN, LSN, College of Health Sciences and Professions, Ohio University, 1 Ohio University Dr., Athens, OH 45701.; e-mail: schaumle@ohio.edu.
J Pediatr Health Care. (2022) *36*, e1-e6

0891-5245/$36.00

Published online July 13, 2022.

https://doi.org/10.1016/j.pedhc.2022.07.002

KEY WORDS

COVID-19 vaccine, vaccination rate, pediatric vaccine, COVID-19, health care providers

INTRODUCTION

Vaccination is a critical primary preventive measure in public health. Centers for Disease Control and Prevention Advisory Committee on Immunization Practices offers guidelines regarding the timing and administration of childhood immunizations (Kroger, Bahta, & Hunter, 2022). The Advisory Committee on Immunization Practices and American Academy of Pediatrics recommend the COVID-19 vaccine for children aged ≥ 5 years who do not have a known vaccine contraindication (Committee on Infectious Diseases, 2022). Despite these recommendations, recent trends suggest that childhood vaccine hesitancy has increased during the pandemic (He, Mack, Neely, Lewis, & Anand, 2022) as the topic of vaccines gains attention. By December 2021, Ohio children aged 5−11 years had a COVID-19 vaccine uptake rate of 16%, which is lower than the national rate of 20.2% (Kaiser Family Foundation, 2022; Wagner, 2021). The delay in or refusal of vaccination increases the risk of potentially life-threatening diseases in children and communities.

By November 2021, 67.0% of the total U.S. population received at least one dose of the COVID-19 vaccine (Centers for Disease Control and Prevention, 2022a). Comparatively, Ohio with an estimated population of 11,780,017, (United States Census Bureau, 2022) had a lower overall vaccination rate of 55.5% (at least one dose) or 6,543,647 (Ohio Department of Health, 2022). Although the first COVID-19 vaccine for children 12−15 years of age was approved by the Food and Drug Administration in May 2021 and for children 5−11 years in October 2021, parents' hesitancy challenges pediatric vaccination efforts.

In a large national sample, 167,262 out of 1,068,410 pediatric patients (15.6%) tested positive for COVID-19, and

6.1% were hospitalized in the pre-Omicron period (Martin et al., 2022). Although serious symptomatic COVID-19 presentation among children is relatively uncommon, clinical sequelae and complications such as multisystem inflammatory syndrome in children and the threat to children with underlying medical conditions, cannot be discounted. Furthermore, peak rates of COVID-19 related hospitalization of children increased from 1.8 per 100,000 during the Delta variant period to 7.1 per 100,000 during the Omicron variant period (Marks et al., 2022).

The decision to accept or refuse vaccination is a complex process that can be influenced by multiple factors. A systematic review attributed influenza vaccine hesitancy to misperceptions regarding susceptibility and severity of disease, concerns about vaccine safety and adverse effects, misunderstanding of vaccine efficacy, and a lack of trust in health authorities (Schmid, Rauber, Betsch, Lidolt, & Denker, 2017). With the onset of the COVID-19 pandemic, additional vaccine concerns and misinformation have surfaced, leading to COVID-19 greater vaccine hesitancy (Rodrigues, Block, & Sood, 2022).

Among 2,769 caregivers in the United States, Canada, and Israel who were surveyed before and after COVID-19 vaccine approval, 61.1% intended to vaccinate their children against COVID-19 on availability. The proportion of caregivers willing to vaccinate their children declined from the preapproval period (63.6%) to the postapproval period (56.6%). Factors positively associated with intent to vaccinate children at both periods were children's up-to-date immunization status and older age of caregivers (Goldman et al., 2021). Another study conducted before Food and Drug Administration approval of the vaccine for children found racial/ethnic disparities in vaccine hesitancy among U.S. parents (Fisher, Gray, & Sheck, 2021). In a survey of 2,074 parents in the United States, 49.4% reported intent to vaccinate their children against COVID-19; parental factors negatively associated with vaccination were lower income and lower education (Teasdale et al., 2021).

The purpose of this study was to identify factors associated with parental intention to vaccinate children against COVID-19 in Ohio during the early period of pediatric vaccine approval.

METHOD

An online anonymous survey was distributed in English through the secure Qualtrics survey program between November 2021 and January 2022 to parents and caregivers through social media platforms and community contacts in schools, health departments, and other health care organizations, including public and private pediatric clinics throughout Ohio. Adults who confirmed that they were parents of at least one school age child were invited to participate in the voluntary online survey. The Health Belief Model (HBM) was the theoretical framework used to identify factors influencing an individual's likelihood to engage in a given health behavior to prevent a negative outcome (Rosenstock, 1974; Rosenstock, Strecher, & Becker, 1988). The survey was comprised demographic questions, 10 items from the Parents Attitudes about Childhood Vaccines (PACV) survey developed using the HBM (Opel et al., 2011), nine questions from the PACV survey that were adapted specifically to the pediatric COVID-19 vaccination, and an open-ended question. The HBM was applied to parents' intent to vaccinate their children against COVID-19, with the model's constructs: components of the PACV for perceived susceptibility (likelihood of experiencing the untoward outcome), perceived severity (seriousness of the consequences associated with the outcome), perceived benefits (potential advantages of engaging in the health behavior and in the ability to prevent the undesired outcome), and perceived barriers (obstacles to engaging in the health behavior such as vaccine hesitancy and lack of health care provider's support), along with modifying variables (personal characteristics including sex, marital status, parity, race/ethnicity, education, insurance, employment, residence, vaccinated parent, infection status) and cues to action (factors that prompt an individual to engage in the health behavior as with the timing of the spike in the pandemic outbreak with the Omicron variant, defined as the variant being detected in every state by December 20, 2021; Centers for Disease Control and Prevention, 2022b).

The vaccination attitude questions used a Likert scale of one to five for level of agreement (strongly disagree, disagree, not sure, agree, strongly agree) and a total score was calculated following the PACV tool instructions. Cronbach's alpha test of internal consistency was conducted to determine the internal reliability of the 10 attitude items regarding childhood vaccination in general and the adapted nine items specific to COVID-19 vaccination. Anonymous data were downloaded from the Qualtrics site and stored on the researchers' password-protected computers. Participant characteristics were described using frequencies. For categorical variables, χ^2 or Fisher exact tests were used to compare proportional differences between the groups regarding parental intent to vaccinate their child against COVID-19. For continuous variables, t tests were used to examine mean differences between the groups. To examine median differences in the pediatric COVID-19 vaccination attitude questions, nonparametric Mann-Whitney U tests were conducted. Variance inflation factor tests were conducted to check for possible collinearity in the regression analysis. Variables that were statistically significant on a level of $p \leq .05$ in bivariate analyses were included in the logistic regression model to calculate odds ratios (OR) and 95% confidence intervals to determine factors associated with intent to vaccinate. Data analyses were conducted using SPSS (version 25, IBM Corp., Armonk, NY). Human subjects' approval for the study was provided by the researcher's Institutional Review Board.

RESULTS

Six hundred and eighty-five parents participated in the survey, hailing from 55 out of 88 counties around the state (62.5% state-wide representation), with participants from

TABLE 1. Characteristics of parent participants in Ohio according to intent to vaccinate their children against COVID-19 (*n* = 581, unless otherwise indicated)

Characteristics	Not vaccinate[a]	Vaccinate[b]	*p* Value
Age (years) (*n* = 571)	39.6 ± 7.7	41.8 ± 7.4	.001
Timing			.468
Before December 20, 2021	20.4 (67)	22.9 (58)	
From December 20, 2021	79.6 (261)	77.1 (195)	
Sex			.330
Male	14.6 (48)	11.9 (30)	
Female	85.4 (280)	88.1 (223)	
Marital status (*n* = 576)	0.526		.526
Married/partnered	9.5 (294)	11.2 (223)	
Not married/partnered	90.5 (31)	88.8 (28)	
Parity	< 0.001		< .001
Primiparous	25.3 (83)	39.9 (101)	
Multiparous	75.7 (245)	60.1 (152)	
Ethnicity/race (*n* = 575)			.134
White	96.0 (310)	98.4 (248)	
Other	4.0 (13)	1.6 (4)	
Education (*n* = 575)			.001
Not college graduate	44.9 (146)	30.8 (77)	
College graduate	55.1 (179)	69.2 (173)	
Employer-based health insurance (*n* = 578)	78.2 (255)	86.5 (218)	.010
Employed in health care	32.3 (106)	28.5 (72)	.317
Residence (*n* = 518)			.705
Urban	26.4 (73)	24.9 (60)	
Rural	73.6 (204)	75.1 (181)	
COVID-19 vaccinated parent	37.1 (122)	100.0 (253)	< .001
COVID-19 infection of parent	77.4 (254)	39.1 (99)	< .001
COVID-19 infection of child	74.4 (244)	38.3 (97)	< .001
Feels vaccine hesitancy	82.9 (272)	4.0 (10)	< .001
Seeks advice from medical person	82.6 (271)	96.0 (243)	< .001
Seeks advice from nonmedical person	59.1 (194)	35.5 (90)	< .001
Perceives health care provider support	21.3 (70)	85.0 (215)	< .001
Childhood vaccination attitudes scale	6.6 ± 5.4	0.9 ± 1.5	< .001
COVID-19 vaccination attitudes scale	13.2 ± 3.4	1.1 ± 1.8	< .001

Note. *Presented values are mean* ± SD *or* n *(%).*
[a]*Intent to not vaccinate:* n = *328 (56.5%).* [b] *Intent to vaccinate:* n = *253 (43.5%).*

rural and urban regions of the state. Among the parents, 581 (84.8%) answered the primary question of their intent to vaccinate their children and the vaccination attitudes scales and were included in the analysis. In answer to the question of intent to vaccinate their children, 43.5% (n = 253) of parents reported that they intended to vaccinate their children against COVID-19, whereas the remaining 56.5% (n = 328) did not intend to vaccinate their children. Characteristics of the parents and their vaccination and infection status are described in Table 1. Specifically, 90.4% perceived support from their health care providers for childhood vaccinations, but only 49.1% perceived provider support for the pediatric COVID-19 vaccination. Perceiving a lack of support by health care providers was significantly associated with not intending to vaccinate children against COVID-19 ($p < .001$).

The reliability of the 10-item general childhood vaccination portion was good with Cronbach's α = 0.899, and for the specific nine-item COVID-19 pediatric vaccination portion, the reliability was good with Cronbach α = 0.946. There were significant differences in pediatric COVID-19 vaccine attitudes between parents who intended and parents who did not intend to vaccinate their children (Table 1). The overall median score regarding pediatric COVID-19 vaccine attitude was 9.0, with a significantly different overall median score for parents who intended to vaccinate (median = 14) and parents who did not intend to vaccinate their children (median = 0). Significant differences were found among parents regarding the median score of each of the pediatric COVID-19 vaccine attitude items (Table 2).

In the logistic regression model, the significant variables associated with intent to vaccinate children against COVID-19 were perceived health care provider support (OR = 7.27; $p = .002$) and the pediatric COVID-19 vaccination attitudes total score (OR = 0.33; $p < .001$; Table 3).

DISCUSSION

The current survey of parents in Ohio indicates that perceived health care provider support and parents' attitudes about pediatric COVID-19 vaccination significantly

TABLE 2. Differences in medians of pediatric COVID-19 vaccination attitudes between parents who report intent to vaccinate their children (*n* = 253) and those who do not intend to vaccinate their children (*n* = 328)

Statement of pediatric COVID-19 vaccination attitude	Not vaccinate	Vaccinate	*p* Value
Pediatric COVID-19 vaccine is safe for child	2	0	< .001
Pediatric COVID-19 vaccine is effective against infection	2	0	< .001
Good idea to give the COVID-19 vaccine to child	2	0	< .001
Better for child to develop immunity by getting COVID-19 infection than getting the vaccine	2	0	< .001
Hesitant about the pediatric COVID-19 vaccine for child	2	0	< .001
COVID-19 vaccine can prevent severe illness	2	0	< .001
Child may develop serious side effects from COVID-19 vaccine	2	0	< .001
Openly discuss concerns about the COVID-19 vaccine with health care provider	0	0	< .001
Trust health care provider's information about COVID-19 vaccine	1	0	< .001

influenced their intent to vaccinate their children. This outcome aligned with the National Vaccine Advisory Committee 2015 report. Parents' attitudes regarding vaccine safety, efficacy, and benefits, in addition to their overall beliefs about vaccine-preventable diseases, are notable influences on the decision to vaccinate (National Vaccine Advisory Committee 2015). As such, health care providers working with families should focus on educating parents on the importance and safety of vaccines. This can be accomplished by incorporating evidence-based strategies into their practice.

Motivational interviewing is a strategy that can be used by health care providers to decrease vaccine hesitancy (McGregor & Goldman, 2021). Motivational interviewing is a nonconfrontational communication style that uses empathetic, guided questioning that facilitates discussion. This strategy decreases negative attitudes and perception of vaccine risk while increasing the patient-provider trust and communication.

Parents who are vaccine-hesitant do not feel childhood vaccination is a common practice (McGregor & Goldman, 2021). Presumptive or announcement-type language can create a perception that vaccination is normal practice, increasing the possibility of vaccine uptake (Jacobson, St Sauver, Griffin, MacLaughlin, & Finney Rutten, 2020). Presumptive language is different than the conversational or participatory language in that presumptive language uses strong statements of what the health care provider intends to do. In this type of communication, a health care provider may state "Your child is due for the COVID-19 vaccine today."

Two other interventions that may be implemented into a health care provider's practice are a patient reminder and a recall system (Jacobson Vann, Jacobson, Coyne-Beasley, Asafu-Adjei, & Szilagyi, 2018) and an interdisciplinary previsit plan. This plan offers vaccination education to a patient or a parent, by telephone before the patient's scheduled appointment date (Shafer, Kearns, Carney, & Sagar, 2021). This allows the patient to receive vaccine information before the appointment, increasing the chance of vaccine uptake during the appointment.

Our study found a significant difference in parents' attitudes regarding children's vaccination on the basis of their vaccination status. The HBM was previously used to examine predictors of vaccine uptake, with a study suggesting a correlation between parents' vaccination status and their intent to vaccinate their children (Smith et al., 2011), further emphasizing the importance of offering parents evidence-based information by trusted health care providers. A recent study of vaccine intention for influenza and COVID-19 using the HBM found that adults in the United States were more likely to intend to vaccinate on the basis of their perception of the individual benefits and risks rather than perceived risk of the disease within the larger community (Mercadante & Law, 2021). Furthermore, the study found

TABLE 3. Factors associated with parents' intent to vaccinate their children against COVID-19 (*n* = 581)

Factor	Odds ratio	95% confidence interval	*p* Value
Age	1.04	0.95–1.13	.425
Parity	0.47	0.11–2.02	.310
College education	0.33	0.06–1.78	.198
Private insurance	0.95	0.11–8.10	.946
COVID-19 infection of parent	1.03	0.20–5.19	.975
COVID-19 infection of child	2.10	0.38–11.57	.394
Health care provider support	7.27	2.03–26.03	.002**
Seeks advice from medical person	2.64	0.41–17.05	.307
Seeks advice from nonmedical person	3.28	0.85–12.65	.084
Childhood vaccination attitudes scale	1.29	0.95–1.74	.101
COVID-19 vaccination attitudes scale	0.33	0.24–0.46	< .001***

**p < *.01*.
***p < *.001*.

that participants in the 18–49 age group with a lower income and lack of a personal contact directly affected by COVID-19 were less likely to intend to vaccinate (Mercadante & Law, 2021). This is noteworthy given the age by which most adults are having children and making vaccine-related decisions on their behalf.

Although, according to the regression model, only two HBM components were significantly associated with the intent to vaccinate children, the circumstances of COVID-19 persistence may have affected the other components. For example, by the time of the survey, COVID-19 had been at pandemic levels for approximately 2 years. Despite millions of people being infected nationally, there were limited pediatric fatalities and apparent overall mitigation of serious infection by the time of the Omicron variant. This may have minimized the severity among children and preclusion of the cue to action specific to the Omicron variant spike. Similarly, modifying variables that were significant on the bivariate did not remain significant in the model.

Parents' perception of their health care providers' support was a significant factor in their intent to vaccinate children. This demonstrates the importance of trusted health care providers clearly and consistently following evidence-based practice guidelines in educating their families regarding the safety and efficacy of the vaccine in preventing severe COVID-19 infection. Despite the recommendation to vaccinate children against COVID-19, (Committee on Infectious Diseases, 2022), uptake rates among children aged five to 11 in Ohio of 16.0% were lower than national rates of 20.2% by December 12, 2021 (Kaiser Family Foundation, 2022; Wagner, 2021). The two-dose vaccine has been found to be safe and effective in reducing the risk of infection in youth (Frenck et al., 2021) and was found to be 91% effective against developing multisystem inflammatory syndrome in children in children (Zambrano et al., 2022).

Parental vaccine hesitancy, which was reported by 48.5% of parents in the current study, is a challenge that health care providers must address by ensuring there is continuity in vaccine-promoting messages at all levels of the clinical organization (Finney Rutten et al., 2021; Olusanya, Bednarczyk, Davis, & Shaban-Nejad, 2021). Evidence-based strategies to promote parental vaccine acceptance during the COVID-19 pandemic focus on emphasizing the importance of improved vaccine counseling practices among pediatric providers which adhere to the recommended immunization schedule while allowing parental questions and concerns to be fully addressed. In addition, employing vaccine recall and reminder systems, adhering to safety protocols and infection control practices within the office, and seeking creative ways to ensure vaccine access among all populations were highlighted (Olusanya et al., 2021).

LIMITATIONS

A limitation of this study was self-selection bias, as parents with strong opinions about the pediatric COVID-19 vaccine may have been more inclined to participate in the survey. In addition, the original PACV tool was developed on the basis of the HBM, although the model is specific to behavior rather than intention. Regardless, strong reliability was found with the original tool and the tool adapted to COVID-19 vaccination. Further research is recommended to determine the applicability of the adapted PACV tool to pediatric COVID-19 vaccination.

This study provides several implications for clinical practice. Adults who personally received the COVID-19 vaccine unequivocally reported their intent to vaccinate their children. This highlights the importance of adherence to evidence-based immunization guidelines by adult health care providers. Gaining vaccine confidence and acceptance from parents when making their personal vaccine-related decisions may lay the foundation for future vaccine approval for their child.

According to the survey, parents who did not perceive their pediatric provider supporting the COVID-19 vaccine were significantly less likely to report an intent to vaccinate their child. This demonstrates that providers must be clear and consistent in offering vaccine-promoting messages that align with the recommended immunization schedule. Parental vaccine acceptance may be diminished if those entrusted with the health care of their children do not actively endorse the vaccine.

The discrepancy between parents' perception of provider support for routine childhood immunizations in contrast to the COVID-19 vaccine suggests a need for increased provider education regarding the COVID-19 vaccine in general, as well as health care provider training in vaccine counseling best practices. Equipping pediatric providers with the skills to address parental vaccine concerns and communicate a strong recommendation for COVID-19 vaccination may demonstrate provider support for the vaccine. Consequently, this may lead to greater parental acceptance of the COVID-19 vaccine for children.

Conclusions

COVID-19 vaccines are an important public health measure to decrease the risk of morbidity and mortality. Beginning in November 2021, Ohio parents were surveyed to understand their perception of the COVID-19 vaccine and their intention to vaccinate their children against COVID-19. Study findings revealed that perceived health care provider support of the vaccine significantly influenced parents' decision to vaccinate their children, highlighting the important role that health care providers play in pediatric vaccination. Health care providers should educate parents about the COVID-19 vaccine to promote vaccination uptake and dispel fears about the vaccine.

REFERENCES

Centers for Disease Control and Prevention. (2022a). COVID-19 vaccinations in the United States. Retrieved from https://covid.cdc.gov/covid-data-tracker/#vaccinations_vacc-total-admin-rate-pop5.

Centers for Disease Control and Prevention. (2022b). COVID-19 omicron in the United States. Retrieved from https://www.cdc.gov/coronavirus/2019-ncov/variants/omicron-variant.html?

s_cid=11735:omicron%20variant%20symptoms:sem.b:p:RG:GM:gen:PTN:FY22
Committee on Infectious Diseases. (2022). COVID-19 vaccines in children and adolescents. *Pediatrics*, *149*, e2021054332.
Finney Rutten, L. J., Zhu, X., Leppin, A. L., Ridgeway, J. L., Swift, M. D., Griffin, J. M., & Jacobson, R. M. (2021). Evidence-based strategies for clinical organizations to address COVID-19 vaccine hesitancy. *Mayo Clinic Proceedings*, *96*, 699–707.
Fisher, C. B., Gray, A., & Sheck, I. (2021). COVID-19 pediatric vaccine hesitancy among racially diverse parents in the United States. *Vaccines*, *10*, 31.
Frenck, R. W., Jr., Klein, N. P., Kitchin, N., Gurtman, A., Absalon, J., Lockhart, S., … C4591001 Clinical Trial Group. (2021). Safety, immunogenicity, and efficacy of the BNT162b2 Covid-19 vaccine in adolescents. *New England Journal of Medicine*, *385*, 239–250.
Goldman, R. D., Krupik, D., Ali, S., Mater, A., Hall, J. E., Bone, J. N., … On Behalf Of The International Covid-Parental Attitude Study Covipas Group. (2021). Caregiver willingness to vaccinate their children against COVID-19 after adult vaccine approval. *International Journal of Environmental Research and Public Health*, *18*, 10224.
He, K., Mack, W. J., Neely, M., Lewis, L., & Anand, V. (2022). Parental perspectives on immunizations: impact of the COVID19 pandemic on childhood vaccine hesitancy. *Journal of Community Health*, *47*, 39–52.
Jacobson, R. M., St Sauver, J. L., Griffin, J. M., MacLaughlin, K. L., & Finney Rutten, L. J. (2020). How health care providers should address vaccine hesitancy in the clinical setting: Evidence for presumptive language in making a strong recommendation. *Human Vaccines and Immunotherapeutics*, *16*, 2131–2135.
Jacobson Vann, J. C., Jacobson, R. M., Coyne-Beasley, T., Asafu-Adjei, J. K., & Szilagyi, P. G (2018). Patient reminder and recall interventions to improve immunization rates. *The Cochrane database of systematic reviews*, *1*, CD003941.
Kaiser Family Foundation. (2022). Update on COVID-19 vaccination of 5–11 Year olds in the U.S.Retrieved from https://www.kff.org/coronavirus-covid-19/issue-brief/update-on-covid-19-vaccination-of-5-11-year-olds-in-the-u-s/
Kroger, A., Bahta, L., & Hunter, P. (2022). General best practice guidelines for immunization: Best practices guidance of the Advisory Committee on Immunization Practices. Retrieved from https://www.cdc.gov/vaccines/hcp/acip-recs/general-recs/downloads/general-recs.pdf
Marks, K. J., Whitaker, M., Anglin, O., Milucky, J., Patel, K., Pham, H., … COVID-NET Surveillance Team. (2022). Hospitalizations of children and adolescents with laboratory-confirmed COVID-19 — COVID-NET, 14 states, July 2021-January 2022. *Morbidity and Mortality Weekly Report*, *71*, 271–278.
. . . Martin, B., DeWitt, P. E., Russell, S., Anand, A., Bradwell, K. R., Bremer, C., & Bennett, T. D. (2022). Characteristics, outcomes, and severity risk factors associated with SARS-CoV-2 infection among children in the US National COVID cohort collaborative. *JAMA Network Open*, *5*, e2143151.
McGregor, S., & Goldman, R. D. (2021). Determinants of parental vaccine hesitancy. *Canadian Family Physician Medecin de Famille Canadien*, *67*, 339–341.
Mercadante, A. R., & Law, A. V. (2021). Will they, or won't they? Examining patients' vaccine intention for flu and COVID-19 using the Health Belief Model. *Research in Social and Administrative Pharmacy*, *17*, 1596–1605.
Olusanya, O. A., Bednarczyk, R. A., Davis, R. L., & Shaban-Nejad, A. (2021). Addressing parental vaccine hesitancy and other barriers to childhood/adolescent vaccination uptake during the coronavirus (COVID-19) pandemic. *Frontiers in Immunology*, *12*, 663074.
Opel, D. J., Taylor, J. A., Mangione-Smith, R., Solomon, C., Zhao, C., Catz, S., & Martin, D. (2011). Validity and reliability of a survey to identify vaccine-hesitant parents. *Vaccine*, *29*, 6598–6605.
Rodrigues, F., Block, S., & Sood, S. (2022). What determines vaccine hesitancy: Recommendations from childhood vaccine hesitancy to address COVID-19 vaccine hesitancy. *Vaccines*, *10*, 1–14.
Rosenstock, I. M. (1974). Historical origins of the Health Belief Model. *Health Education Monographs*, *2*, 328–335.
Rosenstock, I. M., Strecher, V. J., & Becker, M. H. (1988). Social learning theory and the health belief model. *Health Education Quarterly*, *15*, 175–183.
Schmid, P., Rauber, D., Betsch, C., Lidolt, G., & Denker, M. L. (2017). Barriers of influenza vaccination intention and behavior — A systematic review of influenza vaccine hesitancy, 2005–2016. *PLoS One*, *12*, e0170550.
Shafer, R., Kearns, C., Carney, M., & Sagar, A. (2021). Leveraging interdisciplinary teams for pre-visit planning to improve pneumococcal immunization rates among internal medicine subspecialty practices. *Journal of Primary Care and Community Health*, *12*, 21501319211060986.
Smith, P. J., Humiston, S. G., Marcuse, E. K., Zhao, Z., Dorell, C. D., Howes, C., & Hibbs, B. (2011). Parental delay or refusal of vaccine doses, childhood vaccination coverage at 24 months (about 2 years) of age, and the Health Belief Model. *Public Health Reports*, *126*(Suppl. 2), 135–146.
Teasdale, C. A., Borrell, L. N., Kimball, S., Rinke, M. L., Rane, M., Fleary, S. A., & Nash, D. (2021). Plans to vaccinate children for coronavirus disease 2019: A Survey of United States parents. *Journal of Pediatrics*, *237*, 292–297.
Ohio Department of Health. (2022). State of Ohio COVID-19 vaccine dashboard. Retrieved from coronavirus.ohio.gov/dashboards/covid-19-vaccine/covid-19-vaccination-dashboard
United States Census Bureau. 2022. (n.d.). Quick facts Ohio. Retrieved from https://www.census.gov/quickfacts/fact/table/OH#
Wagner, M. (2021). 'You should just get the shot. It's going to be OK,' Ohio kids are getting the COVID-19 vaccine. Retrieved from https://www.dispatch.com/story/news/2021/12/12/ohio-children-covid-19-vaccine/6442707001/
Zambrano, L. D., Newhams, M. M., Olson, S. M., Halasa, N. B., Price, A. M., Boom, J. A, , & Overcoming COVID-19 Investigators. (2022). Effectiveness of BNT162b2 (Pfizer-BioNTech) mRNA vaccination against multisystem inflammatory syndrome in children among persons aged 12–18 years — United States, July–December 2021. *MMWR. Morbidity and Mortality Weekly Report*, *71*, 52–58.