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CORRESPONDENCE

COVID-19 vaccine concerns of health care providers and ancillary staff

A web-based survey was widely distributed between November 1st–December 27th, 2021, to health care providers and ancillary staff to assess reported COVID-19 vaccination of their children as well as their vaccine concerns. Fewer nurses and laboratory / radiology technicians reported COVID-19 vaccination of their adolescent children and intent to vaccinate their younger children compared to physicians and pharmacists, along with more frequently reported concern about anaphylaxis and infertility. Focused efforts to update ancillary staff as well as all health care providers on emerging COVID-19 vaccine safety information for children is crucial to promote strong COVID-19 vaccine recommendations.

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IMPACT: Nurses, laboratory technicians and radiology technicians frequently reported concern about anaphylaxis and infertility after COVID-19 vaccination despite reassuring safety data. Education of ancillary staff with emerging safety data is important to strengthen health care provider vaccine recommendations.

INTRODUCTION

Recommendations of health care providers have been shown to increase vaccine uptake, with quality of the recommendation positively associated with vaccination[1–3]. Less is known about the role of other health care staff in promoting vaccine uptake. During an office visit, a patient may encounter a receptionist, nurse, physician, laboratory or radiology technician, as well as a pharmacist after the visit. Studies have shown lower rates of COVID-19 vaccination among nurses and aides compared to physicians[4], and variation in their trusted sources of vaccine information[5]. We examined COVID-19 vaccine concerns among a range of health care providers and ancillary staff and assessed reported vaccination of their adolescent children and intent to vaccinate younger children as part of an effort to improve pediatric COVID-19 vaccine uptake.

METHODS

The study took place November 1st–December 27th, 2021 at an integrated health system with approximately 15 hospitals and 235 clinics. A web-based survey was widely distributed by organizational leaders to cascade to health care providers and ancillary staff to assess intent to vaccinate their children against COVID-19 and concerns regarding vaccination. Respondents were categorized as physicians, advanced practice providers, pharmacists, nurses, and other personnel (administrative personnel, laboratory personnel and imaging personnel). The study was approved by the Institutional Review Board, and all participants gave informed consent.

RESULTS

Of 1883 total respondents, 1437 had children and were eligible to participate in the survey. Of these, 46% were physicians, 2% advanced practice providers, 39% nurses, 3% pharmacists, and 10% other personnel. Most providers reported receiving a pediatrician recommendation for their adolescent to be vaccinated (physician 52%, pharmacist 55%, nurse 61%, and other personnel 48%) (Table 1). Physicians and pharmacists reported higher vaccination of their children 12–17 years old (91%) compared to 61% of nurses and 59% of other personnel ($p < 0.001$). Physicians and pharmacists also reported higher intention to vaccinate their children 5-11 years old (80% and 75%, respectively) compared to 39% of nurses and 38% of other personnel ($p < 0.001$). Concerns about COVID-19 vaccines were more commonly reported by nurses and other personnel than physicians and pharmacists (Table 2); for example, more than twice as many nurses and other personnel reported concerns about allergic reactions and infertility compared to physicians and pharmacists, closely followed by concerns about the vaccines being too new and the perception that children do not need the vaccine.

DISCUSSION

Despite overall high vaccination among respondents (92%) and no differences by provider/staff type for receipt of a pediatrician recommendation, fewer nurses and other personnel versus physicians and pharmacists reported vaccination of their adolescents and intention to vaccinate their younger children. Concerns about COVID-19 vaccines reported by nurses and other personnel also differed significantly from concerns reported by physicians and pharmacists. While all providers and staff reported safety concerns such as myocarditis and local and systemic reactions, nurses and other personnel more frequently reported concern about anaphylaxis and infertility. Although COVID-19 disease has been shown to have adverse effects on fertility and pregnancy outcomes, COVID-19 mRNA vaccines have not been found to be associated with reduced fecundity[6,7]. A review of anaphylaxis from the Vaccine Adverse Event Reporting System (VAERS) database found a rate of approximately 2.5–4.7 per 1,000,000 doses with the mRNA COVID-19 vaccines[8]. In the Vaccine Safety Datalink (VSD), anaphylaxis rates after dose 2 of mRNA COVID-19 vaccine were approximately 75% lower than anaphylaxis rates after dose 1[9].

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Table 1. COVID-19 vaccination perspectives and intentions among respondents with children, by provider type.

	Parents of adolescents ages 12–17						*p*-value
	Overall *N* = 581 *n* (%)	**Physician *N* = 236 *n* (%)**	**Advanced Practice Provider *N* = 7 *n* (%)**	**Nurse *N* = 255 *n* (%)**	**Pharmacist *N* = 22 *n* (%)**	**Other *N* = 61 *n* (%)**	
Pediatrician recommended respondent's adolescent child(ren) receive a COVID-19	320 (56)	120 (52)	5 (71)	154 (61)	12 (55)	29 (48)	0.2
Any of respondent's children 12–17 years old received a COVID-19 vaccine	422 (74)	212 (91)	3 (43)	153 (61)	20 (91)	34 (59)	<0.001
	Parents of children ages 5–11						***p*-value**
	Overall *N* = 822 *n* (%)	**Physician *N* = 375 *n* (%)**	**Advanced Practice Provider *N* = 15 n (%)**	**Nurse *N* = 313 n (%)**	**Pharmacist *N* = 28 n (%)**	**Other *N* = 91 *n* (%)**	
Plan to vaccinate child(ren) ages 5–11 years							<0.001
Yes	474 (59)	293 (80)	6 (40)	121 (39)	21 (75)	33 (38)	
No	252 (31)	39 (11)	9 (60)	164 (52)	3 (11)	37 (43)	
Not sure	83 (10)	35 (10)	0 (0)	28 (9)	4 (14)	16 (19)	

p-values from chi-square tests or Fisher exact tests, as appropriate.

Table 2. Concerns about COVID-19 vaccines for children among parents, by provider type.

	Overall *N* = 1436 *n* (%)	**Physician *N* = 661 *n* (%)**	**Advanced Practice Provider *N* = 25 *n* (%)**	**Nurse *N* = 563 *n* (%)**	**Pharmacist *N* = 47 *n* (%)**	**Other *N* = 140 *n* (%)**	***p*-value**
No concerns	392 (27)	263 (40)	2 (8.0)	93 (17)	8 (17)	26 (19)	<0.001
Safety (myocarditis, blood clots, etc.)	844 (59)	320 (48)	18 (72)	387 (69)	26 (55)	93 (66)	<0.001
Side effects (fever, chills, sore arm, etc.)	494 (34)	187 (28)	13 (52)	218 (39)	15 (32)	61 (44)	<0.001
Allergic reactions (hives, anaphylaxis, etc.)	373 (26)	99 (15)	11 (44)	203 (36)	6 (13)	54 (39)	<0.001
Infertility	276 (19)	39 (6)	7 (28)	186 (33)	2 (4)	42 (30)	<0.001
Vaccine is too new	475 (33)	109 (16)	8 (32)	282 (50)	8 (17)	68 (49)	<0.001
Kids don't need the vaccine	284 (20)	81 (12)	10 (40)	162 (29)	5 (11)	26 (19)	<0.001
Long-term effects of COVID-19 vaccine	616 (43)	164 (25)	11 (44)	343 (61)	22 (47)	76 (54)	<0.001
Other	34 (2)	8 (1)	0 (0)	22 (4)	1 (2)	3 (2)	0.037

p-values from chi-square tests or Fisher exact tests, as appropriate.
Note: One respondent did not indicate their provider type and was excluded from the table above.

Limitations of this study include selection bias given the open distribution of the survey, such that respondents may not be representative of their provider/staff type. Despite this limitation, the survey is consistent with prior findings of parental concern that a COVID-19 vaccine might cause lasting health problems for their child or serious vaccine side effects[10] and expands upon prior work to identify differences in specific concerns about pediatric COVID-19 vaccination across health care providers and ancillary staff.

These findings underscore the need for focused efforts to update ancillary staff as well as all health care providers on emerging COVID-19 vaccine safety information for children. As ancillary staff have multiple interactions with pediatric patients and their caregivers before, during, and after a visit, it is imperative that they are equipped to strengthen, rather than diminish, COVID-19 vaccine recommendations.

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DATA AVAILABILITY

All data generated or analyzed during this study are included in this published article.

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AUTHOR CONTRIBUTIONS

B.J.L., D.B. and K.B. conceptualized and designed the study, drafted the initial manuscript, and reviewed and revised the manuscript. J.E.T., J.C. and Y.X.L. designed the data collection instruments, collected data, carried out the initial analyses, and reviewed and revised the manuscript. K.R.C. and J.L.R. and C.M.-P. conceptualized and designed the study, and reviewed and revised the manuscript. All authors approved the final manuscript as submitted and agree to be accountable for all aspects of the work.

CONSENT STATEMENT

All participants gave informed consent upon starting the anonymous web-based survey.

CONFLICT OF INTEREST

Ms Tubert reports research funding from Moderna and Pfizer unrelated to this study. Dr Luo reports research funding from GlaxoSmithKline, Seqirus, Moderna, and Pfizer unrelated to this study. Dr Rondinelli reports research funding from Merck unrelated to this study. Dr Bruxvoort reports research funding from Dynavax, Gilead, GlaxoSmithKline, Seqirus, Moderna, and Pfizer unrelated to this study. The remining authors declare no competing interests.

ADDITIONAL INFORMATION

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