training years, we developed logistic regression models adjusted for these characteristics and subspecialty fixed effects (eMethods in the Supplement). Stata, version 16.1, was used for analysis.

Results | Of 4216 trainees, 4121 (97.7%) responded. Respondents and nonrespondents were not significantly different in age, gender, medical school location (US or international), or subspecialty. After exclusion criteria were applied, the analytic sample included 3868 participants; 2620 (67.7%) were female, and 2882 (74.5%) were graduates of US medical schools (**Table 1**).

In all, 2047 respondents (56.4%) reported high level of interest in emotional and MH needs of children with CMCs; 2390 (62.8%), that pediatricians in their subspecialty should be responsible for MH assessment; and 774 (20.5%), high level of competence in their MH skills. Across subspecialties, 38.4% (95% CI, 34.7%-42.1%) to 89.9% (95% CI, 84.1%-95.7%) reported high level of interest (**Table 2**); 26.9% (95% CI, 23.6%-30.2%) to 94.7% (95% CI, 90.4%-99.1%), high levels of perceived responsibility; and 12.9% (95% CI, 9.9%-15.9%) to 57.8% (95% CI, 47.3%-68.4%), high levels of perceived competence. Interest and perceived competence did not differ across training years, whereas perceived responsibility was significantly lower among second- and third-year fellows compared with first-year fellows.

Discussion | In this study, 56.4% of pediatric fellows were interested in MH care and 62.9% felt their subspecialty should be responsible for addressing emotional and MH concerns of children with CMCs, but few felt competent. This pattern is similar to an analysis of residents who reported low competence in MH skills.[3] Adolescent medicine and developmental-behavioral fellows did not report high levels of competence, although these subspecialties have 4-week residency rotations intended to improve MH education for pediatric residents.[4] Lower responsibility ratings among upper-year fellows may reflect incorporation of faculty member norms. A study limitation is its reliance on self-report; studies suggest clinicians tend to overreport competence.[5]

Pediatric professional societies are increasingly embracing MH skills training. This is relevant for subspecialists given the substantially higher prevalence of MH conditions in children with vs without CMCs.[6] To address the mortality and morbidity associated with the current MH crisis, subspecialty fellows in all disciplines may benefit from curriculum reform with increased focus on MH skills.

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Detection of Messenger RNA COVID-19 Vaccines in Human Breast Milk

Vaccination is a cornerstone in fighting the COVID-19 pandemic. However, the initial messenger RNA (mRNA) vaccine clinical trials excluded several vulnerable groups, including young children and lactating individuals.[1] The US Food and Drug Administration deferred the decision to authorize COVID-19 mRNA vaccines for infants younger than 6 months until more data are available because of the potential priming of the children's immune responses that may alter their immunity.[2] The Centers

Supplemental content

Table 1. Demographic and Clinical Information About Breast Milk Samples Collected From 11 Lactating Individuals After Receiving an mRNA COVID-19 Vaccine

Participant No.	Maternal age, y	Race and ethnicity	Mode of delivery	Gestational age at birth, wk	Vaccine timing after delivery, wk	Vaccine type[a]
1	33	White	Vaginal	26	10	mRNA-1273
2	33	White	Vaginal	39	25	BNT162b2
3	35	White	Vaginal	37	9	BNT162b2
4[b]	34	Asian	Cesarean	39	18	BNT162b2
5	37	White	Cesarean	39	7	mRNA-1273
6[b]	37	White	Vaginal	32	6	mRNA-1273
7[b]	22	White	Vaginal	38	24	BNT162b2
8[b]	35	White	Cesarean	39	4	BNT162b2
9	38	Black	Vaginal	39	20	BNT162b2
10[b]	34	White	Cesarean	39	7	mRNA-1273
11	35	White	Cesarean	26	5	mRNA-1273

Abbreviation: mRNA, messenger RNA.

[a] mRNA-1273 was manufactured by Moderna and BNT162b2 by Pfizer-BioNTech.

[b] Participants who had detectable vaccine mRNA in their breast milk.

Table 2. Detection of Vaccine RNA in Whole Expressed Breast Milk and Extracellular Vesicles in 5 Patients at Various Time Points Postvaccination

Participant No.	Vaccine type	Time points of vaccine mRNA detection in EBM	Concentration of vaccine mRNA detected in whole milk[a]	Concentration of vaccine mRNA detected in EBM EVs[a]
4	BNT162b2	27-h[b] Sample	Not detected	14.01 pg/mL
6	mRNA-1273	27-h and 42-h[b] Samples	11.7 pg/mL	16.78 pg/mL
7	BNT162b2	37-h[b] Sample	Not detected	4.69 pg/mL
8	BNT162b2	1-h and 3-h[b] Samples	1.3 pg/mL	6.77 pg/mL
10	mRNA-1273	45-h[b] Sample	2.5 pg/mL	2.13 pg/mL

Abbreviation: EBM, expressed breast milk; EVs, extracellular vesicles; mRNA, messenger RNA.

[a] Units for concentration are picogram of mRNA per milliliter of whole milk equivalent.

[b] Sample used for vaccine mRNA concentration detection.

for Disease Control and Prevention recommends offering the COVID-19 mRNA vaccines to breastfeeding individuals,[3] although the possible passage of vaccine mRNAs in breast milk resulting in infants' exposure at younger than 6 months was not investigated. This study investigated whether the COVID-19 vaccine mRNA can be detected in the expressed breast milk (EBM) of lactating individuals receiving the vaccination within 6 months after delivery.

Methods | This cohort study included 11 healthy lactating individuals who received either the Moderna mRNA-1273 vaccine (n = 5) or the Pfizer BNT162b2 vaccine (n = 6) within 6 months after delivery (**Table 1**). Participants were asked to collect and immediately freeze EBM samples at home until transported to the laboratory. Samples of EBM were collected before vaccination (control) and for 5 days postvaccination. A total of 131 EBM samples were collected 1 hour to 5 days after vaccine administration. Extracellular vesicles (EVs) were isolated in EBM using sequential centrifugation, and the EV concentrations were determined by ZetaView (Analytik) (eMethods in the Supplement). The presence of COVID-19 vaccine mRNA in different milk fractions (whole EBM, fat, cells, and supernatant EVs) was assayed using 2-step quantitative reverse transcriptase-polymerase chain reaction. The vaccine detection limit was 1 pg/mL of EBM (eMethods in the Supplement).

Results | Of 11 lactating individuals enrolled, trace amounts of BNT162b2 and mRNA-1273 COVID-19 mRNA vaccines were detected in 7 samples from 5 different participants at various times up to 45 hours postvaccination (**Table 2**). The mean (SD) yield of EVs isolated from EBM was 9.1^{10} (5.0^{10}) particles/mL, and the mean (SD) particle size was 110.0 (3.0) nm. The vaccine mRNA appears in higher concentrations in the EVs than in whole milk (Table 2). No vaccine mRNA was detected in prevaccination or postvaccination EBM samples beyond 48 hours of collection. Also, no COVID-19 vaccine mRNA was detected in the EBM fat fraction or the EBM cell pellets.

Discussion | The sporadic presence and trace quantities of COVID-19 vaccine mRNA detected in EBM suggest that breastfeeding after COVID-19 mRNA vaccination is safe, particularly beyond 48 hours after vaccination. These data demonstrate for the first time to our knowledge the biodistribution of COVID-19 vaccine mRNA to mammary cells and the potential ability of tissue EVs to package the vaccine mRNA that can be transported to distant cells. Little has been reported on lipid nanoparticle biodistribution and localization in human tissues after COVID-19 mRNA vaccination. In rats, up to 3 days following intramuscular administration, low vaccine mRNA levels were detected in the heart, lung, testis, and brain tissues, indicating tissue biodistribution.[4] We speculate that, fol-

lowing the vaccine administration, lipid nanoparticles containing the vaccine mRNA are carried to mammary glands via hematogenous and/or lymphatic routes.[5,6] Furthermore, we speculate that vaccine mRNA released into mammary cell cytosol can be recruited into developing EVs that are later secreted in EBM.

The limitations of this study include the relatively small sample size and the lack of functional studies demonstrating whether detected vaccine mRNA is translationally active. Also, we did not test the possible cumulative vaccine mRNA exposure after frequent breastfeeding in infants. We believe it is safe to breastfeed after maternal COVID-19 vaccination. However, caution is warranted about breastfeeding children younger than 6 months in the first 48 hours after maternal vaccination until more safety studies are conducted. In addition, the potential interference of COVID-19 vaccine mRNA with the immune response to multiple routine vaccines given to infants during the first 6 months of age needs to be considered. It is critical that lactating individuals be included in future vaccination trials to better evaluate the effect of mRNA vaccines on lactation outcomes.

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COMMENT & RESPONSE

Trends in Autism Spectrum Disorder Among Children and Adolescents in the US From 2016 to 2020

To the Editor Several studies have reported trends in autism spectrum disorder (ASD) in recent years, with a particular interest in exploring the potential effects of the COVID-19 pandemic.[1-3] The study by Li et al[1] estimated the prevalence of ASD among children and adolescents in the US from 2019 to 2020 based on data from the National Health Interview Survey (NHIS). They reported that the prevalence of ASD decreased from 2.76% in 2016 to 2.29% in 2017 and increased from 2.29% in 2017 to 3.49% in 2020. However, according to another recent study[2] based on data from the National Survey of Children's Health (NSCH), the prevalence of current ASD diagnoses was stable from 2016 (2.5%) to 2020 (2.7%). Caution should be taken in the interpretation of the findings from Li et al[1] for the following reasons.

First, although data from NHIS could be used to estimate ASD prevalence in the US, the NSCH has a sample size of children and adolescents aged 3 to 17 years in 2019 and 2020 4 to 9 times larger than that of NHIS (29 433 and 42 777 from NSCH vs 7648 and 4870 from NHIS, respectively).[1,2] This difference is further highlighted by the narrower 95% CIs of weighted prevalence based on the data from NSCH than that from NHIS. For instance, the prevalence of ASD in 2020 was 2.7% (95% CI,