

# Association Between Caregiver Opposition to Topical Fluoride and COVID-19 Vaccines



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## BACKGROUND

**Vaccines** help prevent and reduce transmission and severity of diseases like coronavirus (COVID-19). However, many caregivers are vaccine hesitant or opposed to childhood vaccines. Caregiver hesitancy and opposition to non-COVID-19 childhood immunizations and the COVID-19 vaccine stem from similar beliefs.

- FDA-approved COVID-19 vaccines became available to children and adolescents aged 5 and older in the U.S. during 2021<sup>1,2</sup>
- Currently, **28.4%** of 5- to 11-year-old children and **58.9%** of 12- to 17-year-old adolescents in the U.S. are fully vaccinated against COVID-19<sup>3</sup>
- 87% of children hospitalized from December 2021 – February 2022 were not vaccinated for COVID-19<sup>4</sup>

### Common Reasons Caregivers Report COVID-19 Vaccine Hesitancy<sup>5</sup>

- Fast rate of vaccine development
- Distrust in its safety and efficacy
- Fear of adverse reactions
- Unknown long-term side effects
- Perception of reduced COVID-19 disease severity in children

Analogous to how vaccines prevent systemic diseases, **topical fluoride** helps prevent dental caries in high-risk children.

- 13% of caregivers may oppose topical fluoride treatment for their children during healthcare visits<sup>6</sup>
- Larger proportions of caregivers are likely to be hesitant about topical fluoride (accept fluoride treatment but may have underlying concerns)
- Some children whose caregivers refuse topical fluoride may have high levels of untreated, preventable dental disease

## PURPOSE

Previous work reported a significant association between opposition of topical fluoride and childhood vaccines.<sup>7</sup> There has been no recent investigation in this line of research, especially during the COVID-19 pandemic.

The goals of the current study were to:

1. Evaluate whether caregiver opposition to topical fluoride is specifically associated with opposition to COVID-19 vaccines
2. Identify other factors associated with COVID-19 vaccine opposition

## METHODS

A single-site, observational cross-sectional study was administered at the University of Washington's Center for Pediatric Dentistry (UW CPD) in Seattle, WA.

An 85-item electronic survey was administered via REDCap during patient care visits (dental checkups and treatment) at the UW CPD between 2/1/2021 and 9/30/2021.

The survey included questions on oral health knowledge, beliefs and reasons for opposition to topical fluoride, and beliefs about COVID-19 vaccines.

Eligibility criteria:

- English-speaking caregivers of children aged <18 years
- Children were patients of record at the UW CPD
- One caregiver per household could participate

### PREDICTOR VARIABLE

"On a scale of 0 to 10 with '0' being 'not at all opposed' and '10' being 'totally opposed,' how opposed are you to topical fluoride for your child/children?"

CODED AS YES / NO

### OUTCOME VARIABLE

"On a scale of 0 to 10 with '0' being 'not at all opposed' and '10' being 'totally opposed,' how opposed are you to a COVID-19 vaccine for your child/children?"

CODED AS YES / NO

## RESULTS

- Of 651 respondents, 403 caregivers were included in the final analytical sample
- Caregivers who opposed topical fluoride were **3.13 times** as likely to oppose COVID-19 vaccines for their child (95% CI: 1.87, 5.25;  $P<0.001$ )
- A **lower education level** (OR=3.47; 95% CI: 1.44, 8.38;  $P<0.006$ ) and **self-reported conservative political ideology** (OR=2.77; 95% CI: 1.26, 6.08;  $P<0.011$ ) were significantly correlated with COVID-19 vaccine opposition
- In a bivariate analysis, racial minorities were significantly more likely to be opposed to the COVID-19 vaccine for their children compared to white caregivers (OR=2.71; 95% CI: 1.81, 4.06;  $P<0.001$ ; data not shown)
- Race failed to achieve statistical significance in a logistic regression model with multiple covariates

## RESULTS CONTINUED

Variable	Adjusted Odds Ratio (95% CI)	<i>p</i> Value**
<b>Fluoride Varnish Opposition</b>		
Opposed	3.13 (1.87-5.25)	<b>&lt;0.001</b>
Not Opposed*	-	-
<b>Education Level</b>		
High school equivalent or less	3.47 (1.44-8.38)	<b>0.01</b>
More than 4 years*	-	-
<b>Political Ideology</b>		
Very Conservative or Conservative	2.77 (1.26-6.08)	<b>0.01</b>
Moderate	2.03 (1.20-3.44)	<b>0.01</b>
Very Liberal or Liberal*	-	-

\* Reference Group

\*\* Level of significance for  $P$ -value <0.05

† Level of significance for  $P$ -value <0.01

‡ Level of significance for  $P$ -value <0.001

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## CONCLUSIONS

1. Caregiver topical fluoride opposition in dental settings is significantly associated with COVID-19 vaccine opposition for their children.
2. Caregiver education level and self-reported political ideology are also significantly associated with COVID-19 vaccine opposition.
3. Additional research is needed to develop clinical interventions, including tailored and evidence-based communication strategies and a clinical screening tool for fluoride opposition; this tool could also identify children who are unvaccinated against COVID-19.
4. Future research should identify ways to use the common risk factor approach to address topical fluoride and vaccine opposition concurrently for disease prevention and improving the health of children.

## REFERENCES

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