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Parents' adherence to pediatric health and safety guidelines: Importance of patient-provider relationships

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Abstract

Objective—To examine 1) parent-provider communication about pediatric health/safety guidelines, 2) trust in child's provider, 3) comfort discussing guidelines, 4) agreement with guideline advice, 5) self-efficacy following guidelines, and their impact on guideline adherence.

Method—256 parents of children ages 0–6 completed an online survey about sunscreen use, newborn Vitamin K injections, influenza vaccination, routine vaccination, car seats, infant safe sleep, furniture anchoring, large trampoline use, and firearm safety. Multivariable models regressed: 1) communication about each guideline on parents' corresponding guideline adherence; 2) trust, comfort discussing guidelines, agreement with guideline advice, self-efficacy, on parents' total guideline adherence.

Results—Communication about furniture anchoring ($OR=2.26$), sunscreen ($OR=5.28$), Vitamin K injections ($OR=3.20$), influenza vaccination ($OR=13.71$), routine vaccination ($OR=6.43$), car seats ($OR=6.15$), and infant safe sleep ($OR=3.40$) related to corresponding guideline adherence ($p < 0.05$). Firearm safety communication was not related to adherence ($OR=1.11$, *n.s.*). Trampoline communication related to lower likelihood of trampoline guideline adherence ($OR=0.24$, $p=0.001$). Agreement with guideline advice ($\beta=0.35$), trust ($\beta=0.34$), self-efficacy ($\beta=0.45$), comfort discussing guidelines ($\beta=0.35$) positively related to total guideline adherence ($p < 0.001$).

Conclusion—Findings underscore the importance of provider communication about health/safety guidelines.

Practice Implications—Providers should respectfully engage and build relationships with parents to support health/safety guideline adherence.

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Keywords

guideline adherence; health communication; health behaviors

1. Introduction

The American Academy of Pediatrics outlines numerous pediatric health and safety guidelines that can prevent childhood illness or injury. Sub-committees formulate these guidelines using evidence-based research and expert consensus[1]. These guidelines aim to create standards for consistent, cost-effective pediatric clinical care that optimize health outcomes for children[1].

Although healthcare providers are encouraged to address these guidelines with parents, they may face challenges implementing all recommended practices[2–4], which may influence parents' guideline adherence. During pediatric visits, providers may have to choose how to effectively prioritize their discussions among the many recommended guidelines[5,6]. In addition, parents may have other developmental or acute concerns about their children, leaving providers with limited time to address all age-relevant health and safety recommendations[3,4,6]. Providers also vary in their knowledge and confidence discussing developmental and age appropriate anticipatory topics[5,6]. Although parent-provider discussions may increase adherence to recommended behaviors across areas such as vaccination[7], sun protection[8], infant sleep safety[9], and car seat safety[10], providers may perceive barriers to some guideline conversations. For example, vaccination conversations can be difficult due to parent vaccine fears and hesitations[11] and providers may feel uncomfortable discussing firearm safety because of perceptions of intrusiveness or political undertones[12].

Parent-related factors can also impact adherence to guidelines. Parents' limited resources to purchase products for children (e.g. car safety seats, sunscreen) may affect adherence[5,13]. Cultural beliefs can lead some to mistrust guidelines; parents may instead follow norms of their family members or social networks[14,15]. Daily inconveniences, like those associated with infant sleep positions and locations, may reduce adherence[16]. Self-efficacy to follow guidelines is also an important factor that influences parent behaviors[13,17,18].

In this study, we explored parents' adherence to nine health and safety guidelines for children under six years old, including sunscreen use, newborn Vitamin K injection, influenza vaccination, routine vaccination (e.g. MMR, TDAP, Varicella, etc.), car safety seat use, infant safe sleep practices, furniture anchoring, large trampoline use, and firearm safety. Collectively, adherence to these nine guidelines reduces the child's immediate and/or long-term risk of injury, illness, or death.

We tested several hypotheses based on the Theory of Planned Behavior (TPB)[19]. TPB posits that behavioral attitudes, perceived social norms, and perceived behavioral control predict a person's intention to engage in a behavior, and intention and perceived behavioral control predict actual behavior. We hypothesized that agreement with guidelines, trust in providers, comfort communicating with providers about guidelines, and confidence

following guidelines would be positively associated with the number of guidelines to which parents adhered. We also hypothesized that provider communication about each of the nine health or safety topics would be associated with a higher likelihood of adherence to each corresponding guideline.

2. Methods

2.1 Participants

Eligible participants were adult (≥ 18 years old), English speaking parents who resided in the United States, and were the primary caregivers to at least one child under six years of age (≤ 71 months). If parents indicated they had more than one child in the age range, they responded to survey items thinking only about their oldest child under six years old. We assessed behaviors about the oldest child because parenting practices of the younger child(ren) may be influenced by practices and outcomes with the oldest child. In addition, guidelines may have been more relevant for older children who have reached additional developmental milestones and transitions (e.g. from rear-facing to forward-facing to booster car safety seats).

2.2 Procedure

We recruited participants through Amazon Mechanical Turk (mTurk), a web service that enables researchers and businesses to collect data and complete tasks via paid workers. Participants who met eligibility criteria completed an online consent and short survey, which took about 20 minutes. At the end of the survey, participants received an alphanumeric code, which they entered on the Amazon mTurk website in order to receive compensation. Verified participants received \$1 in compensation, a standard rate of pay for Amazon mTurk users[20]. MTurk data has been demonstrated to be valid and representative of the general U.S. population[20–22]. The study was approved by the Human Research Protection Office of Washington University in St Louis.

2.3 Measures

2.3.1 Health and safety guideline communication—Participants completed nine items about communication with their child’s provider pertaining to each health or safety guideline. The items read “Has your child’s healthcare provider ever talked to you about...” 1) using sunscreen, 2) advice about a Vitamin K injection for your child when they were born, 3) giving your child a yearly flu shot, 4) giving your child their routine vaccines (e.g. MMR, TDAP, Varicella, etc.), 5) car seat or booster seat usage, 6) infant safe sleep positions, 7) anchoring furniture and TVs to prevent them from tipping over, 8) large trampoline use, and 9) gun storage in the home? Participants responded with “yes”, “no”, or “don’t know”. “Don’t know” responses were grouped with “no” responses. Most communication items were adapted using wording from the car safety seat advice item (CS31) in the Agency for Healthcare Research and Quality’s Medical Expenditure Panel Survey (MEPS) Child Preventative Health Supplement[23].

2.3.2 Health and safety guideline adherence—Adherence to the nine guidelines of interest, our primary outcomes, was assessed using components of individual American

Academy of Pediatrics recommendations, with the exception of furniture anchoring which has not yet been addressed by the AAP. Because Vitamin K injections are often considered routine at birth and parents have to “opt-out” if they do not want to receive them, responses of “don’t know” and “yes” were both considered adherent. For other guidelines, “don’t know” options were considered “no” responses. We asked parents if their child had a medical or religious exemption from receiving any routine vaccines. Parents who reported a vaccine exemption were viewed as adherent. In addition, car safety seat adherence behaviors were only asked of parents who indicated that they owned a car. Based on responses to these items, nine individual adherence classifications were created, as described in Table 1 (1=adherent; 0=non-adherent). We also created a total score of adherence by summing adherence scores across the nine guidelines.

2.3.3 Agreement with providers’ guideline advice—Parents responded to one item that asked how strongly they agreed with the advice their child’s healthcare provider gives them about health and safety guidelines. Response choices consisted of five options on a Likert scale from *strongly disagree* to *strongly agree*; a higher score indicated higher agreement with the provider’s guideline advice.

2.3.4 Self-efficacy to follow health and safety guidelines—Parents responded to one item that asked about their confidence in their ability to follow the healthcare provider’s advice about safety guidelines for their child on a 5-point scale from *not confident at all* to *completely confident*. Higher scores indicated higher confidence or self-efficacy to follow health and safety guidelines. This item was adapted from the large, national survey of patients’ experiences in primary health care [24].

2.3.5 Comfort talking to a provider about health and safety guidelines—One item assessed parent comfort in talking to the child’s provider about safety guidelines for the child. Response options were on a 5-point scale from *not at all comfortable* to *completely comfortable*, where a higher score indicated a higher comfort level. This item was adapted from large, national survey of patients’ experiences in primary health care [24].

2.3.6 Trust in provider—A single item assessed trust in the child’s usual provider or those at their usual place of care on a 4-point scale from *do not trust at all* to *trust a lot*. Higher scores indicated more trust in the healthcare provider. This item and response options were developed from a previously validated, standardized questionnaire [25].

2.3.7 Participant characteristics—Participants were asked to report their race, education, income, religion/spiritual practice (Christian; Buddhist; Hindu; Jewish; Muslim; Sikh; Agnostic; Atheist), and political leaning (very liberal; liberal; moderate; conservative; very conservative; independent). We grouped non-Christian religions together in analyses due to small numbers within each, and grouped political leaning into three categories that included: very liberal or liberal; moderate or independent; conservative or very conservative. We also collected data on child and parent age and gender, parent marital status, relation to child (e.g., biological, adoptive), number of children in household, and parent and child insurance status. Participant characteristic items were modeled after items from a large,

national survey, the Health Information National Trends Survey (HINTS), developed and administered by the National Institute of Health[26].

2.4 Analytic Strategy

Descriptive statistics were calculated pertaining to child and parent demographic characteristics, parents' access to healthcare, and relationship to child's usual healthcare provider. Individual logistic regression models examined the likelihood of adherence to each of the nine health and safety guidelines as predicted by communication about each corresponding health or safety topic, controlling for race, education, and income. In models predicting adherence to firearm safety, influenza vaccination, and routine vaccination guidelines, we also controlled for political ideology. In separate models, we used linear regression to examine the total number of guidelines to which parents adhered, using the following parent predictors: agreement with a provider's advice about safety guidelines, confidence in ability to follow the provider's advice about guidelines, comfort talking to the provider about safety guidelines for the child, and trust in the child's usual provider. All analyses were conducted using SPSS version 23.

3. Results

3.1 Participants

A total of 398 individuals completed screening questions in an attempt to participate in the study. 332 parents were eligible and provided informed consent, and 256 completed the survey (77% response rate). Parents had a mean age of about 33 years old. Most were White (81%), college-educated (59%), and female caregivers (60%). Their mean child age was about 43 months or 3.5 years old. Table 2 displays descriptive characteristics of the sample.

Parents most frequently reported discussing routine vaccinations (87.7%) and influenza vaccinations (79.9%) with their child's provider, and least often discussed large trampoline safety (10.2%). Parents most frequently reported adherence to car safety seat guidelines (96%) and firearm safety guidelines (89.8%), and least often adhered to infant safe sleep guidelines (20.2% adhered to all safe sleep practices assessed). Parents reported a mean of 5.57 out of 9 (62%) guidelines to which they adhered.

3.2 Associations of Guideline Communication with Guideline Adherence

In all but two instances, in multivariate analyses, communication about a health or safety guideline significantly and positively predicted adherence to the corresponding guideline. Newborn Vitamin K injection communication ($OR = 3.20$, 95% *C.I.* 1.66 – 6.17, $p < 0.001$), sunscreen communication ($OR = 5.28$, 95% *C.I.* 2.84 – 9.80, $p < 0.001$), communication about influenza vaccinations ($OR = 13.71$, 95% *C.I.* 5.44 – 34.55, $p < 0.001$), communication about routine vaccinations ($OR = 6.43$, 95% *C.I.* 2.70 – 15.33, $p < 0.001$), infant safe sleep communication ($OR = 3.40$, 95% *C.I.* 1.32 – 8.74, $p = 0.01$), car safety seat use communication ($OR = 6.15$, 95% *C.I.* 1.25 – 30.32, $p = 0.03$), and furniture anchoring communication ($OR = 2.26$, 95% *C.I.* 1.23 – 4.15, $p < 0.01$) were all associated with higher likelihood of adherence to corresponding guidelines. One anomaly was large trampoline use communication, which was associated with a *lower* likelihood of adhering to trampoline

safety guidelines ($OR = 0.24$, 95% $C.I.$ 0.10 – 0.57, $p = 0.001$). Firearm safety communication was not significantly associated with adherence to firearm safety guidelines ($OR = 1.11$, 95% $C.I.$ 0.34 – 3.67, $n.s.$). Table 3 displays these results.

3.3 Associations of Parent Predictors with Total Guideline Adherence

Self-efficacy to follow health and safety guidelines ($\beta = 0.45$, $p < 0.001$), trust in the child's provider ($\beta = 0.34$, $p < 0.001$), comfort talking to the provider health and safety about guidelines ($\beta = 0.35$, $p < 0.001$), and agreement with a provider's advice about guidelines ($\beta = 0.35$, $p < 0.001$) positively predicted the total number of guidelines to which parents adhered. See Table 4.

4. Discussion and Conclusion

4.1 Discussion

Consistent with our theoretical framework and hypotheses, healthcare provider communication, parent trust in their child's healthcare provider, comfort talking with the provider about guidelines, agreement with the provider's advice about guidelines, and parent self-efficacy to follow guidelines were associated with adherence to a higher number of pediatric health and safety recommendations. Communication about each health or safety topic (with the exceptions of firearm safety and large trampoline use) positively predicted adherence to the corresponding guideline. These findings highlight the clinical and public health significance of parent-provider conversations about health and safety topics for improving parent adherence. Results also demonstrate the importance of interpersonal relationships between parents and their children's providers when discussing health and safety recommendations.

Results pertaining to communication about particular health and safety topics align with previous research. For instance, discussion or counseling regarding vaccination[7], sun protection[8], infant safe sleep[9], and car safety seat direction[10], have been associated with increased uptake or adherence to each respective guideline. Our findings underscore the practical importance of health and safety discussions for the time-constrained pediatrician. Although pediatricians may perceive that they do not have enough time to address preventative health topics with families[5], their efforts to do so may be worthwhile. Anticipatory guidance, or providing preventative advice, on a number of health and safety topics during well-visits may help providers address these guidelines in a short amount of time during individual visits[27] or across multiple visits.

In particular, magnitudes of effects were quite large for discussions regarding vaccine preventable illnesses (both routine vaccines and influenza vaccines) despite vaccine hesitancy and anxiety becoming more common in parents[11]. Providers are urged to focus much of their attention in the care of infants and young children on immunizations. Finding ways to respectfully engage vaccine-hesitant parents may be helpful in improving adherence. By building rapport and identifying common ground, providing scientific evidence paired with personal narratives, discussing parent values, and tailoring

communication to parents' level of readiness to vaccinate, providers may be able to have an impact on vaccination decision-making[28,29].

Findings pertaining to newborn Vitamin K injection communication and adherence to that guideline were also statistically significant, but effects were not as strong as those for routine and influenza vaccine adherence. The threat of newborn Vitamin K deficiency bleeding may not be well-known to parents[30], which may influence adherence. Decision-making processes surrounding Vitamin K injection may also resemble vaccine-hesitancy, making these discussions more difficult than discussions about other guidelines[31]. There is also a longer timeline during which routine vaccinations can be addressed with parents during childhood, compared with Vitamin K injection[30]. Similar public health messaging and continued policy with an opt-out (rather than opt-in) approach to newborn Vitamin K injections may sustain high rates of Vitamin K guideline acceptance (currently 99% nationally [31]).

Surprisingly, parents reported the lowest adherence to the group of infant safe sleep guidelines assessed in our study (20.2%), despite almost 70% of parents reporting discussions with healthcare providers about sleep safety. Parents most frequently adhered to guidelines discouraging co-sleeping (74.9%), and not using pillows in the crib (69.6%), compared to supine placement (64.7%), not using bumper pads in the crib (53.9%), and not placing other soft items in the crib (47.6%). Past research indicates that adherence to these five components may vary by cultural background or demographics (e.g. co-sleeping[32]; supine placement[33]). Despite public health efforts to educate parents about the dangers of non-adherence to sleep guidelines, including the Back-to-Sleep Campaign[34], some parents may not be aware of or believe the data on the risk of suffocation associated with co-sleeping[35]. Although pediatric healthcare providers likely discuss safe sleep with parents, they may not emphasize all five components equally or tailor safe sleep conversations to parents' current sleep behaviors. Given the higher likelihood of adherence when sleep safety conversations occur, providers should continue to address safe sleep practices and explain the risks of non-adherence to parents. Conversations might need particular sensitivity to cultural norms and the emotionally laden conversations about sleep with new parents.

To our knowledge, this is the first study that has examined furniture anchoring discussions between parents and healthcare providers. Furniture anchoring has not been addressed by the AAP, yet furniture and television tipping accidents present a growing safety threat to young children each year[36–38]. Conversations about furniture anchoring may be an important factor in increasing parent awareness of accidental furniture tipping and their furniture anchoring behavior, which can prevent injuries in their children.

Interestingly, communication about large trampoline usage was associated with a *lower* likelihood of adhering to trampoline safety guidelines, contrary to our hypothesis. Given that our data are cross-sectional, the direction of this relationship is unknown. Parents may be discussing trampoline guidelines with providers *after* their child has experienced a trampoline-related injury. Additionally, conversations about trampolines may not occur in early childhood or across well-child visits like other more immediately relevant guideline conversations (e.g. vaccinations, sleep). Injuries may occur before providers have had a

chance to discuss the safety guidelines. Unfortunately, between 2010 and 2014, there were 7,593 children age 17 and under that visited an emergency department as a result of a trampoline injury (7,326 home trampoline injuries and 267 trampoline park injuries)[39]. Providers should consider ways to address the recommendations to avoid large trampoline use in early childhood.

Contrary to predictions, we found no association between firearm safety conversations and adherence to firearm safety guidelines. Although 90% of parents in our sample reported that they adhered to firearm safety guidelines, only 17% reported talking about firearms with their child's healthcare provider, which may demonstrate the sensitive nature of this topic during healthcare visits. Past research on parent-pediatrician firearm discussions indicate a similarly low frequency of conversations (13%), with 23% of parents saying pediatricians should not ask about the existence of firearms in the home, and 14% stating they would be offended at advice to not keep firearms in the home[12]. Given these parent attitudes and provider confusion over past state laws that limited providers' ability to require collection of firearm safety information as a precursor to care[40], providers may feel uncomfortable or intrusive initiating questions about firearm ownership and storage. It may be useful for providers to focus on building trust and rapport before addressing these types of difficult conversations. One tactic for difficult firearm safety conversations may be to include firearms in a list of household hazards that children should avoid (e.g. household cleaners, medications), which may ease parent discomfort and/or fear of judgement[12]. Developing strategies for approaching firearm safety conversations may lead to different adherence results.

Total guideline adherence was significantly influenced by parent trust in the child's provider, and comfort talking about, agreement with, and self-efficacy to follow guidelines. These findings underscore the importance of the interpersonal relationship with a child's provider on parent behaviors. Trust plays an important role in the decision-making processes for child vaccination[11,41] and infant safe sleep recommendations[9], among other guidelines, as does self-efficacy for guideline adherence (e.g. purchasing and installing booster seats[13,17]; applying child sunscreen[18]). Likewise, agreement with the provider's advice regarding health and safety guidelines is vital for adherence[42–44], as is comfort discussing potentially sensitive topics[12]. Overall, developing parent-provider rapport and positive, long-term relationships may impact adherence to treatment regimens and health-related guidelines[45].

This study has several strengths. We collected data from parents from across the United States. We examined an expansive, unique set of health and safety adherence topics individually, and in combination, in order to understand the total number of guidelines to which parents adhere. To our knowledge, this study was the first to explore factors influencing some parent behaviors like furniture anchoring. In addition, the study was conceptualized based on a widely-studied framework, the Theory of Planned Behavior[19] (TPB). The TPB has been utilized to guide studies that examine intentions, attitudes, and behavior in the similar contexts of vaccination[46,47], sunscreen use[48], infant sleep positioning[49], and injury prevention[50].

These strengths are tempered by some study limitations. Because data are cross-sectional, we cannot determine causality or temporal associations of our findings. Future research could examine associations in a longitudinal fashion. Although our sample roughly resembled the U.S. population, we had fewer Hispanic parents and slightly more White parents than the national population. Although we did explore political ideology for some outcomes, responses may have been impacted by social or cultural norms not explored in this project. Moreover, the method of recruitment and data collection could have biased our sample in favor of those who have access to the Internet. In addition, we assess communication and adherence through self-report, rather than direct observation or medical record data. Communication items only assess the occurrence of conversations, rather than the length, depth, or quality of health and safety guideline discussions. Some guidelines may only be discussed within the context of a brief checklist of items (e.g. “Are you using a rear-facing car seat?”; “Do you regularly apply sunscreen to your child?”; “Do you usually place your infant on their back when you put them to sleep?”), rather than detailed discussions of how to avoid particular risks and keep a child safe and healthy. We also did not assess other ways outside of the healthcare visit in which parents learned about threats to health and safety and related guidelines. Several adherence items pertain to infants, therefore parents with children over age one reported on these adherence behaviors retrospectively, which may have introduced bias. For routine vaccinations, a larger than expected number of parents indicated their child had a religious or medical exemption, and it is not likely that all of these were true exemptions. We chose to take a conservative approach by considering those with an exemption who missed vaccinations to be adherent. Finally, other factors beyond parent-provider communication, agreement with guideline advice, trust, self-efficacy, or comfort discussing guidelines could impact adherence.

4.2 Conclusion

Overall, this study suggests positive associations between conversations about child health and safety topics and adherence to guidelines. It also highlighted the importance of parent trust in a child’s provider, comfort talking about, agreement with, and self-efficacy to follow guidelines on parent behaviors. These findings underscore the importance of health and safety guideline conversations during pediatric health visits, as well as parents’ relationships with healthcare providers. Future studies can build on this work by examining these relationships in observational, longitudinal designs, and assessing both providers’ and parents’ reports.

4.3 Practice Implications

Our findings highlight the importance of providers engaging in concise, respectful health/safety guideline conversations, perhaps over a number of child well visits in order to cover age-appropriate guidelines as they become relevant. To communicate more efficiently across guideline conversations, providers might consider tailoring conversations about guidelines to the individual patient and family[5]. For instance, vaccinations may be at the forefront of most providers’ minds during early well visits, and are vital for the prevention and spread of illness. Other threats, though, may pose dangers due the life-threatening effect of just one accidental injury (e.g. firearm discharge, furniture tipping, or car accidents). The immediacy of a threat to health or safety may vary from family to family. In order to have a more

targeted impact on parents, providers may consider using screening questionnaires about guideline adherence before the face-to-face clinical encounter. By identifying guidelines to which parents do or do not adhere, providers may be able to tailor their discussions more appropriately. While counseling about some guidelines may be fairly standard (e.g. sunscreen), other more sensitive topics (e.g. vaccinations) may require a more nuanced approach for each family, and pre-screening parents could advise providers about which issues may need more discussion. Building trust and rapport with parents may facilitate conversations that are more productive. In addition, practices could provide age-appropriate guideline information to parents via online patient portals, email, postal mail, or through screens in waiting rooms to prepare parents for clinical encounters and reinforce parent-provider conversations.

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Highlights

- Provider communication may improve adherence to pediatric health/safety guidelines.
- Trust, agreement with advice, and comfort with providers may increase adherence.
- Providers can respectfully engage parents in discussions to support adherence.
- Tailoring guideline communication across multiple visits may facilitate discussion.

Table 1**Pediatric Health and Safety Guideline Items and Responses**

Pediatric Health and Safety Guideline Item, 0–6 years	Response Options	Adherent responses
Sunscreen use frequency	4 item Likert scale: Never to All of the time	All of the time <i>or</i> Most of the time
Newborn Vitamin K injection	Yes; No; Don't know	Yes <i>or</i> Don't know
Influenza vaccination: 1) ever; 2) past year	Yes; No; Don't know	1) Yes (ever); <i>and</i> 2) Yes (past year)
Routine vaccinations: 1) frequency of following vaccination advice; 2) ever skipped	1) 4 item Likert scale: Never to All of the time 2) Yes; No; Don't know	1) All of the time; <i>and</i> 2) No
Car safety seat use by age	Rear facing car seat; Front facing car seat; Booster seat; None; N/A, do not use car	Rear facing at any age; Front facing 24 months; Booster seat 48 months
* Infant safe sleep practices: Use of 1) bumper pads; 2) pillows in crib; 3) other items in crib; Frequency of 4) back placement; 5) co-sleeping	1–3) Yes; No; Not applicable/do not use crib 4–5) 5 item Likert: Never to All of the time; N/A, does not use a crib.	1) No; 2) Never; 3) Never; 4) All of the time or Most of the time; 5) Never or Some of the time
Furniture anchoring	4 item Likert scale: None to All of them	All of them or Most of them
Large trampoline use for multiple children: 1) own one; 2) use at trampoline park	1) Yes; No 2) 4 item Likert scale: Never to Often	1) No; <i>and</i> 2) Never or Almost never
Firearm safety: 1) own a firearm; 2) firearm locked 3) firearm unloaded	1) Yes; No; Don't know 2) and 3) 4 item Likert scale: Never to All of the time.	1) No; <i>or</i> 2) All of the time; <i>and</i> 3) All of the time

* For parents of children over 12 months of age, items were phrased retrospectively and referred to when the child was an infant.

Table 2

Descriptive characteristics of participants and outcome variables (N = 256)

Variables	<i>N (%) or Mean (SD, range)</i>
Child age in years	3.58 (1.31, .08 – 5.83)
Parent age in years	32.97 (6.83, 20 – 59)
Child gender	
Male	141 (55.1%)
Parent gender	
Female	152 (60.1%)
Parent marital status	
Married	184 (72.4%)
Parent relation to child	
Biological parent	234 (91.8%)
Non-biological parent or other	21 (8.3%)
Parent race	
White	199 (80.6%)
Parent ethnicity	
Hispanic or Latino	24 (9.3%)
Parent education level	
College degree or higher	151 (59.2%)
Less than college	104 (40.8%)
Parent political leaning	
Liberal or Very liberal	97 (39.8%)
Moderate or Independent	73 (29.9%)
Conservative or Very Conservative	74 (30.3%)
Parent religion	
Christian	146 (57.3%)
Agnostic	52 (20.4%)
Atheist	26 (10.2%)
Other religion	31 (12.1%)
Household income	
\$39,999 or less	54 (21.5%)
\$40,000 to \$59,999	70 (27.9%)
\$60,000 to \$79,999	61 (24.3%)
\$80,000 or more	66 (26.3%)
Insurance Status	
Parent insured	229 (90.2%)
Child insured	208 (81.9%)
Usual HCP or place of care for child: Yes	225 (88.2%)
Ever communicated with HCP about guideline	
Car safety seats	154 (61.1%)
Infant safe sleep	178 (69.5%)

Variables	<i>N (%) or Mean (SD, range)</i>
Influenza vaccination	203 (79.9%)
Routine vaccination	222 (87.7%)
Furniture anchoring	82 (32.2%)
Firearm safety	45 (17.7%)
Large trampoline safety	26 (10.2%)
Sunscreen use	116 (45.5%)
Newborn Vitamin K injection	94 (36.9%)
Adherence to guidelines	
Car safety seats	242 (96%)
Infant safe sleep	47 (20.2%)
Influenza vaccination	133 (52.8%)
Routine vaccination	183 (71.8%)
Furniture anchoring	89 (34.9%)
Firearm safety	229 (89.8%)
Large trampoline safety	189 (74.4)
Sunscreen use	146 (57.3%)
Newborn Vitamin K injection	169 (66.3%)
Total number of guidelines adhered	5.57 (1.59, 1 – 9)
Trust in child's usual HCP	3.64 (0.60, 2 – 4)
Agreement w/ HCP's advice about recommendations	4.15 (0.88, 1 – 5)
Confidence in ability to follow HCP's advice	4.40 (0.84, 1 – 5)
Comfort talking to HCP about guidelines/	4.39 (0.90, 1 – 5)

Table 3

Summary of Multivariable Logistic Regression Models Examining Communication about Each Guideline as it Relates to Adherence to that Guideline (N = 255)

Adherence to guideline about:	Sunscreen	Car safety seat use	Furniture anchoring	Trampoline safety	Newborn Vitamin K Injection	Infant sleep safety	Firearm safety	Influenza vaccination	Routine vaccination
<i>Guideline communication</i> (<i>B</i> (<i>SE</i>))	1.66(0.32)	1.82(0.81)	.82(0.31)	−1.43(0.44)	1.16(0.33)	1.22(0.48)	.11(0.61)	2.62(0.47)	1.86(0.44)
<i>Odds ratio 95% C.I.</i>	5.28 2.84, 9.80	6.15 1.25, 30.32	2.26 1.23, 4.15	0.24 0.10, 0.57	3.20 1.66, 6.17	3.40 1.32, 8.74	1.11 0.34, 3.67	13.71 5.44, 34.55	6.43 2.70, 15.33
<i>p value</i>	0.000	0.026	0.008	0.001	0.000	0.011	0.861	0.000	0.000

Note: All models controlled for race, education, and income. Models for firearm safety, influenza vaccination, and routine vaccination also controlled for political ideology.

Table 4

Summary of Multivariable Linear Regression Models Examining Parent Agreement with HCP, Trust, Confidence, and Comfort about Each Guideline as it Relates to Total Adherence to Health and Safety Guidelines (N = 255)

Independent variable	Total Adherence to Health and Safety Guidelines		
	<i>B</i> (<i>SE B</i>)	β	<i>p</i> value
Agreement with HCP's advice about health and safety regulations	0.60(0.10)	0.35	0.000
Trust in child's HCP	0.81(0.15)	0.34	0.000
Confidence in ability to follow HCP advice about guidelines	0.82(0.10)	0.45	0.000
Comfort talking to HCP about guidelines	0.59(0.10)	0.35	0.000

Note: All models controlled for race, education, and income. Models for firearm safety, influenza vaccination, and routine vaccination also controlled for political ideology. For total adherence, parents who indicated their child had a vaccine exemption and did not indicate their child received routine vaccines were conservatively considered 'adherent'. Sensitivity analyses for the alternate approach (vaccine exemptions + children were unvaccinated were considered 'non-adherent') show slightly higher beta values, but do not make a substantial difference.