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Clinician-parent discussions about influenza vaccination of children and their association with vaccine acceptance

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Abstract

Objective—To examine how clinicians communicate with parents about influenza vaccination and the effect of these communication behaviors on parental vaccine decision-making.

Study Design—We performed a secondary analysis of data obtained from a cross-sectional observational study in which health supervision visits between pediatric clinicians and English-speaking parents of young children were videotaped. Eligible visits occurred during the 2011–2012 and 2013–2014 influenza seasons, included children < 6 months, and contained an influenza vaccine discussion. A coding scheme of 10 communication behaviors was developed and applied to each visit. Associations between clinician communication behaviors and parental verbal vaccine acceptance and parental visit experience were examined using bivariate analysis and generalized linear mixed models.

Results—Fifty visits involving 17 clinicians from 8 practices were included in analysis. The proportion of parents who accepted influenza vaccine was higher when clinicians initiated influenza vaccine recommendations using presumptive rather than participatory formats (94% vs. 28%, $p < 0.001$; adjusted odds ratio 48.2, 95% CI 3.5–670.5). Parental acceptance was also higher if clinicians pursued (vs. did not pursue) original recommendations when parents voiced initial resistance (80% vs. 13%, $p < 0.05$) or made recommendations for influenza vaccine concurrent with (vs. separate from) recommendations for other vaccines due at the visit (83% vs. 33%, $p < 0.01$). Parental visit experience did not differ significantly by clinician communication behaviors.

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CONFLICTS OF INTEREST

The other authors have no financial relationships or conflicts of interest to disclose.

Conclusion—Presumptive initiation of influenza vaccine recommendations, pursuit in the face of resistance, and concurrent vaccine recommendations appear to increase parental acceptance of influenza vaccine without negatively affecting visit experience.

Keywords

Communication; pediatricians; nurse practitioners; parents; infants; influenza vaccines; vaccination; vaccination refusal

INTRODUCTION

Influenza causes significant morbidity and mortality among U.S. children.^{1–3} The influenza-associated hospitalization rate among children <5 years of age was 57.2 per 100,000 in 2014, and there have been between 34 and 358 influenza-associated pediatric deaths each year since 2004.³ Although it is recommended that all persons 6 months of age without contraindications be vaccinated against influenza annually,² only 59.3% of U.S. children were vaccinated in the 2015–2016 season.⁴

Evidence suggests that clinician recommendation is associated with parental acceptance of influenza vaccine for their child^{5,6} and that clinician recommendation may be sufficient for parents to overcome influenza-related concerns.⁷ There are no data, however, describing actual clinician communication with parents about influenza vaccine or the impact of specific behaviors on influenza vaccine acceptance. We previously found that the clinician initiation format for recommending other (non-influenza) childhood vaccines was associated with parental acceptance of those vaccines and parental visit experience.^{8,9} The objectives of this study, therefore, were to: (1) characterize influenza vaccine communication between pediatric clinicians and parents of children aged 6–19 months in the primary care setting; and (2) determine whether certain clinician recommendation practices are associated with parental acceptance of influenza vaccine for their child and parental visit experience.

METHODS

Study Design

We conducted a secondary analysis of videotaped health supervision visit data collected over 2 periods (period 1: September 2011–August 2012, n=113; period 2: April 2013–June 2014, n=103) as part of a cross-sectional observational study aiming to characterize clinician-parent communication about childhood vaccines. A primary analysis of period 1 data was published previously and focused on clinician-parent communication about routine (non-influenza) childhood vaccines.^{8,9} This study was approved by the Seattle Children's Hospital Institutional Review Board.

Participants

We recruited 23 pediatricians and pediatric nurse practitioners from 16 primary care pediatric practices in the Seattle area over the 2 study periods. Parents of children receiving care from a participating clinician were approached in the practice waiting room. Eligible parents were 18 years of age, English-speaking, and had a child aged 1–19 months being

seen for a health supervision visit. Parents were screened for vaccine hesitancy using the validated Parent Attitudes about Childhood Vaccines (PACV) survey,^{10–12} which was embedded into a larger survey about common childhood topics. Vaccine hesitant parents (VHPs), defined as those with a total PACV score of ≤ 50 (scale 0–100),^{11,12} were oversampled in period 1 and the only participants enrolled in period 2. To minimize the chance that participants altered their vaccine-specific behaviors to meet observer expectation, the study was described as one that sought to better understand general clinician-parent communication.

Data Collection

All study visits were videotaped. Parents completed a post-visit survey with 11 demographic items and 15 items pertaining to their visit experience adapted from the validated Outpatient Satisfaction Questionnaire¹³ and Satisfaction with Immunization Service Questionnaire¹⁴ (Appendix A). Videos were edited to contain only the vaccine discussion and subsequently transcribed.

Analysis

Videotaped visits were included in the analysis if they occurred during the typical influenza vaccination season (August–March), involved a child ≥ 6 months of age, and contained a discussion about influenza vaccine for the child.

Coding—One investigator (JDR) used conversation analysis with a subset of the data to refine the coding scheme developed in the primary analysis,^{8,9,15} verifying previously identified communication behaviors as relevant to the influenza vaccine discussion and identifying any unique communication behaviors for influenza vaccine. These were reviewed by another investigator (DJO). The final coding scheme contained 10 influenza vaccine communication behaviors (Appendix B). The two investigators (JDR, DJO) then conducted a 1.5-day, in-person training for 4 coders (AH, KL, MC, NE) on the final coding scheme using 28% of the data. Inter-coder reliability was tested on an additional 40% of the data, with κ ranging from 0.71 to 1.0 (mean $\kappa=0.83$). All 4 coders coded the remaining data independently. Discrepancies were resolved by independent review and subsequent discussion by JDR and DJO. Coders were blinded to parental PACV scores.

Variables—The primary dependent variables were parental verbal acceptance (or not) of influenza vaccine for their child by the visit's end, assessed at the time of coding, and parental visit experience. For the latter, individual responses on the 15-item visit experience measure were scored from 1 (“very poor”) to 7 (“outstanding”) and summed in an unweighted fashion to calculate a total raw score (range: 15–105). A highly rated visit experience was denoted by a score ≥ 90 , whereas a lower rated visit experience was denoted by a score <90 .⁹ Five parents had missing visit experience responses. Adjusting the total score by number of questions answered did not alter the findings; thus, the total raw score was used for all analyses. Two alternative approaches to scoring the visit experience measure were also used. First, a different dichotomization threshold was used, consistent with the top-box scoring method used in Consumer Assessment of Healthcare Providers and System measures¹⁶ and parent–patient experience research.^{17–19} Parents who rated all 15 items with

the highest response category (7) were coded as having a highly rated visit experience, while parents who rated any item <7 were coded as having a lower rated experience. Second, a separate visit experience variable comprised of only the 5 vaccine-related visit experience items was created with a total raw score range of 7–35 (see asterisked items, Appendix A). A highly rated vaccine-related visit experience was defined in two ways: (1) total score ≥ 30 (i.e., 6 or 7 on all 5 items); and (2) total score ≥ 28 (the median total raw score). Neither alternative approach changed the findings; thus, only data using the first approach are presented.

Secondary outcomes included parental acceptance (or not) immediately after clinician initiation of the influenza vaccine recommendation and, if the parent voiced immediate resistance to this recommendation, parental acceptance (or not) immediately after clinician pursuit (if present). Verbal resistance was coded when a parent: (1) rejected the clinician recommendation explicitly (e.g., “*I don’t do the flu shot*”); (2) demurred (e.g., “*I don’t know*”); (3) proposed a contingency as an obstacle to acceptance (e.g., “*He has a birthday party tomorrow*”); or (4) raised questions or concerns in response to the recommendation (e.g., “*Do they have to have it?*”). Resistance types were dichotomized into explicit (code 1 above) vs. non-explicit (codes 2–4) rejections. The primary independent variable was the communication format used by clinicians to initiate the influenza vaccine recommendation. As in our previous analyses,^{8,9} this was dichotomized into ‘presumptive’ and ‘participatory.’ Presumptive formats are linguistically designed to presuppose acceptance, biasing answers toward acceptance. Clinician declarations that influenza vaccine would be given (e.g., “*Today you’re gonna do Hep A and flu*”), even if a ‘tag question’ was added to the end (e.g., “*And we’ll do the flu vaccine. Is that okay?*”), were coded as presumptive (Appendix B). Participatory formats allow parents more decision-making latitude. They included polar interrogatives (e.g., “*Are we gonna do the flu vaccine today?*”), open interrogatives (e.g., “*How do you feel about the influenza vaccine?*”), and a format presupposing parents would not vaccinate (e.g., “*You could come back for flu*”). A secondary independent variable was clinician pursuit of their original recommendation when parents voiced initial resistance.^{8,9} We considered clinicians to have pursued if they continued to advocate their original recommendation immediately after parents verbalized resistance. We considered clinicians not to have pursued if they accepted parental resistance or pursued mitigated versions of their original recommendations (Appendix B). For visits where both influenza and other childhood vaccines were recommended, we coded for whether the influenza vaccine recommendation: (1) was produced concurrently with other recommendations (i.e., same stretch/turn of talk) or separately (i.e., as its own independent recommendation, separated from others by parent talk or other clinician behaviors); and (2) occurred before or after other recommendations (Appendix B). Additional variables included demographic and visit characteristics and vaccine hesitancy status. Although the influenza vaccine dose needed by the child (i.e., first vs. second dose in a season) could affect clinician communication and parental acceptance, only 3 visits involved a discussion of a needed second dose and exclusion of these visits did not affect our findings. Thus, all visits were included in analyses.

Quantitative Analysis—Demographic and visit characteristics, total PACV score, total parental visit experience score, and coded clinician-parent communication behaviors were summarized using descriptive statistics. Pearson’s chi-square and Fisher’s exact tests were used to assess the relationships between clinician initiation format and clinician pursuit with parental acceptance of influenza vaccine for their child by the visit’s end and parental visit experience. Generalized linear mixed models were used to examine the impact of clinician initiation format on vaccine acceptance and visit experience, adjusting for factors associated with these outcomes in bivariate analysis ($p < 0.20$) and accounting for clinician clustering. The effect of clinician pursuit was not assessed using a generalized linear mixed model due to small sample size. For visits where both influenza and other childhood vaccines were recommended, the effect of relation (i.e., concurrent *vs.* separate) and order (i.e., first *vs.* last) on the primary outcomes was examined in bivariate analysis. Additionally, coding of clinician initiation and pursuit formats for influenza vaccine was merged with previous coding of clinician initiation and pursuit formats for other childhood vaccines.^{8,9} McNemar’s test was used to compare clinician initiation and pursuit formats for recommending influenza *vs.* other childhood vaccines. Given the small sample size, risk differences (RD) and 95% CIs were calculated for non-significant comparisons. Analyses were performed using SAS Version 9.4 (Cary, NC).

RESULTS

Fifty videotaped health supervision visits involving 17 pediatric clinicians (9 female, 8 male) from 8 primary care practices (2 university-based, 2 multispecialty group, 2 suburban private, 1 community hospital-based, 1 urban private) were included (Figure 1). Parents were primarily mothers who were married, white, 30 years of age, had a household income > \$75,000, and were vaccine hesitant (Table 1). Most (85%) had discussed vaccines previously with their child’s clinician.

There was a slightly higher proportion of visits where clinicians used a presumptive format (52%) rather than participatory format (48%) to initiate the influenza vaccine recommendation (Figure 2a). Clinician use of a presumptive initiation format during visits with non-VHPs and VHPs did not differ significantly (67% *vs.* 46%, $p = 0.31$; RD 20%, 95% CI: -13–54%). Over half (56%) of clinicians used the same initiation format for all recommendations (Appendix C). Among clinicians who used both initiation formats across visits, the initiation format utilized did not vary by parental vaccine hesitancy status (data not shown).

Less than half (44%) of parents immediately accepted the clinician’s initial influenza vaccine recommendation. Immediate acceptance was higher when the clinician used a presumptive rather than a participatory format (72% *vs.* 17%, $p < 0.01$), even among VHPs (73% *vs.* 13%, $p < 0.01$). Immediate acceptance did not differ significantly between non-VHPs and VHPs (60% *vs.* 38%, $p = 0.29$; RD 22%, 95% CI: -15–58%). Among parents who immediately voiced resistance to the clinician’s initial recommendation, 70% explicitly rejected the recommendation (93% of whom were VHPs), 25% raised questions or concerns, and 5% cited contingency plans.

In response to parental verbal resistance, only 25% of clinicians pursued their original recommendation (Figure 2b). Fewer clinicians pursued VHPs than non-VHPs (13% vs. 75%; $p<0.05$) and parents who resisted using an explicit rather than less explicit rejection (7% vs. 67%; $p<0.05$). In response to clinician pursuit, 60% of parents voiced immediate acceptance.

Overall, 48% of parents accepted influenza vaccine for their child by the visit's end. A higher proportion did so if the clinician used a presumptive vs. participatory initiation format (94% vs. 28%, $p<0.001$) and if the clinician pursued vs. did not pursue the original recommendation after the parent initially resisted (80% vs. 13%, $p<0.05$). The proportion of parents who accepted influenza vaccine also varied by vaccine hesitancy status (VHPs 39% vs. non-VHPs 75%, $p<0.05$), but not by demographic characteristics. In the generalized linear mixed model, a presumptive initiation format was positively associated with influenza vaccination acceptance after adjusting for vaccine hesitancy status and accounting for clinician clustering (AOR 48.2, 95% CI: 3.5–670.5).

There were 33 visits where the clinician initiated recommendations for both influenza and other childhood vaccines. Fewer clinicians used a presumptive initiation format for the influenza vaccine recommendation than for other vaccine recommendations (58% vs. 73%, $p=0.17$; RD 15%, 95% CI: –6–36%). Discordant initiation formats were used in 39% of recommendations. The majority (69%) used a participatory format for influenza and a presumptive format for other vaccines (Table 2; Appendix D). Parental response to the initial recommendation was similar for influenza and other vaccines (47% immediate acceptance for both). In visits where the parent immediately resisted the recommendation for both ($n=13$), clinician pursuit differed by vaccine type ($p<0.05$): 23% of clinicians pursued their initial recommendation for both, 31% pursued for other vaccines only, and 46% did not pursue for either. None pursued only their influenza vaccine recommendation.

In 82% of visits where the clinician initiated recommendations for both influenza and other childhood vaccines ($n=27$), influenza was mentioned after (rather than before) other vaccines. In 61% ($n=20$), the influenza vaccine recommendation was made concurrently with (rather than separate from) other vaccine recommendations. A higher proportion of parents accepted influenza vaccine for their child by the visit's end if the clinician recommended it concurrently with rather than separately from other vaccines (83% vs. 33%, $p<0.01$). The order of the influenza recommendation relative to that for other vaccines did not have an effect (influenza first 75% vs. influenza last 62%, $p=1.0$)

In 56% of visits, parents reported a highly rated visit experience. The proportion of highly rated visit experiences did not differ between presumptive vs. participatory initiation formats (52% vs. 63%, $p=0.49$; RD 11%, 95% CI: –20–42%), pursuit vs. no pursuit (60% vs. 60%; $p=1.0$), or VHPs vs. non-VHPs (61% vs. 42%, $p=0.25$; RD –19%, 95% CI: –52–14%). The proportion did vary by child gender (75% females vs. 43% males, $p<0.05$), parent age (86% 18–29 year-olds vs. 45% 30 year-olds, $p<0.05$), and household income (77% $> \$75,000$ vs. 39% $> \$75,000$, $p<0.01$). No association between clinician initiation format and highly rated visit experience was found in the generalized linear mixed model, after adjusting for these demographic characteristics and accounting for clinician clustering. In visits where influenza

and other childhood vaccines were needed, highly rated visit experience did not differ by recommendation relation or order.

DISCUSSION

To our knowledge, this study is the first to characterize actual clinician-parent communication behaviors pertaining to influenza vaccination in the primary care setting. We found that clinician approach to initiating and pursuing the influenza vaccine recommendation and the contextual relationship of this recommendation with that of other needed vaccines affected parental acceptance of influenza vaccine for their child without negatively influencing visit experience. These findings may be particularly valuable when designing future interventions aiming to increase influenza vaccine uptake among children.

The association of increased parental acceptance of influenza vaccine for their child with a presumptive rather than participatory initiation format is consistent with results from our previous work involving other childhood vaccines^{8,9} and a recent trial involving the human papillomavirus (HPV) vaccine.²⁰ It is also in accordance with general evidence illustrating that subtle wording changes can alter response outcomes.²¹ The positive association between clinician pursuit of parents who voiced initial resistance and parental acceptance of influenza vaccine is also consistent with our data involving other childhood vaccines.^{8,9} Additionally, it is in line with evidence suggesting that information and assurances from a clinician are the main reason why parents planning to delay or decline a vaccine for their child change their mind.²²

In this study, provider format for initiating the influenza vaccine recommendation and provider pursuit of this recommendation did not significantly affect parental visit experience. While our previous analyses assessing the association between clinician communication behaviors and parental visit experience in the context of other childhood vaccines similarly found no effect of provider pursuit on parental visit experience, it did show that the proportion of highly rated visit experiences differed by initiation format (64% presumptive vs. 96% participatory).⁹ It is likely that the present study was underpowered to detect a significant difference in parental visit experience by initiation format. Alternatively, the discrepancy between studies could reflect inadequate understanding of what constitutes—and how to measure—parental experience with a vaccine visit, although analyses using only vaccine-related experience items in the present study still did not show an effect.

In visits where both influenza and other childhood vaccines were needed, greater parental acceptance of influenza vaccine was observed when clinicians combined their recommendation for influenza with their recommendations for other vaccines, effectively delivering a single recommendation package. This strategy of avoiding independent recommendations is similar to that suggested for HPV and other adolescent vaccines.^{23,24} Further, we found a higher proportion of visits where clinicians used a participatory initiation format and did not pursue resistant parents for influenza compared to other vaccines. A similar discrepancy in clinician initiation format was demonstrated recently with HPV compared to other adolescent vaccines.²⁵ This may reflect a need for increased

clinician education about the importance of these two vaccines and enhanced vaccine communication skills training.

This study has several limitations. First, our sample size was small and drawn from one geographical region. Our results, therefore, may not be generalizable to other clinicians, practices, or settings. Our sample size also reduced our study power and ability to perform certain subgroup analyses. Second, parental and clinician attitudes and practices related to influenza vaccination could have changed between the 2 non-consecutive study periods and also since our final study period. Additionally, given the observational design, we cannot account for unobserved confounding. Clinicians who varied their initiation format, for example, may have opted to do so based upon perceptions of parental vaccine hesitancy, prior vaccine discussions with parents, or other unmeasured variables.

CONCLUSION

We found that more parents accepted influenza vaccine for their child when clinicians used a presumptive format for initiating the influenza vaccine recommendation, pursued their original recommendation if parents voiced initial resistance, and combined their influenza vaccine recommendation with that for other childhood vaccines. These communication behaviors did not appear to negatively impact parental visit experience. Strategies to educate clinicians about these effective communication practices are needed.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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ABBREVIATIONS

ACIP	Advisory Committee on Immunization Practices
HPV	human papillomavirus
PACV	Parent Attitudes about Childhood Vaccines survey
VHP	Vaccine hesitant parent

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HIGHLIGHTS

- Presumptive initiation of influenza vaccine recommendations increases acceptance
- Provider pursuit when parents voice initial resistance increases acceptance
- Bundling vaccine recommendations increases acceptance of influenza vaccine
- Presumptive initiation, pursuit or recommendation bundling do not affect visit experience

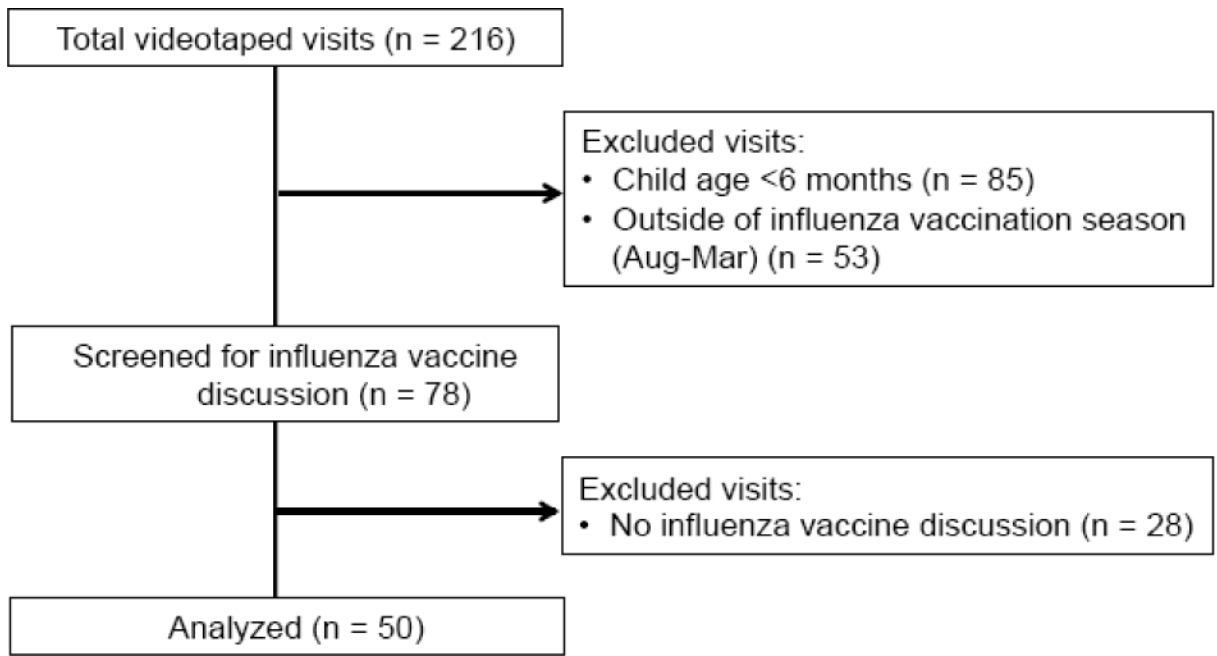


FIGURE 1.
Study Sample

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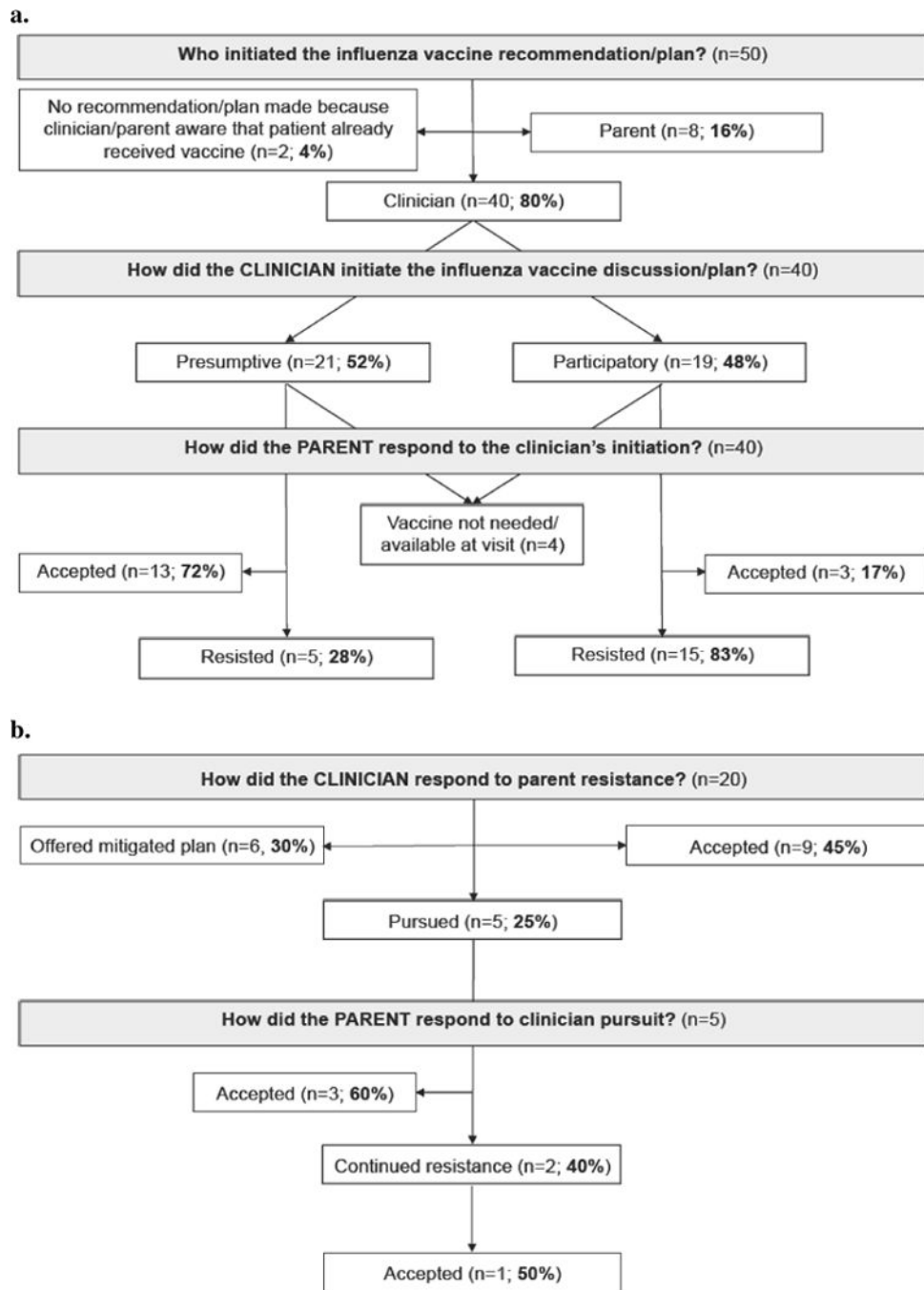


FIGURE 2.
 Clinician-Parent Conversation about Influenza Vaccination
a. Clinician Initiation and Parental Response
b. Clinician Pursuit of Parental Resistance

TABLE 1

Characteristics of Study Sample (n=50)

Characteristics	
Child Sex, % (n)	
Male	60 (30)
Female	40 (20)
Child Age (months), mean (SD)	10.4 (3.7)
Participant Relation to Child, % (n)^a	
Mother	84 (38)
Father	16 (7)
First Born Child, % (n)^a	67 (30)
Number of Children in Household, % (n)^a	
1	64 (29)
2	25 (11)
3	7 (3)
4 or more	4 (2)
Parent Age, % (n)^a	
30 years or older	69 (31)
18–29 years	31 (14)
Parent Highest Education, % (n)^a	
More than 4-year college degree	18 (8)
4-year college degree	35 (16)
Some college or 2-year degree	29 (13)
High school graduate or GED	18 (8)
Household Income, % (n)^a	
\$75,001 or greater	51 (23)
\$50,001–\$75,000	25 (11)
\$30,001–\$50,000	11 (5)
\$30,000 or less	13 (6)
Marital Status, % (n)^a	
Married	87 (39)
Single	7 (3)
Living with Partner	7 (3)
Parent Hispanic Ethnicity, % (n)^a	2 (1)
Parent Race, % (n)^a	
White	77 (35)
Asian	9 (4)
Black	7 (3)

Characteristics	
Multiracial	7 (3)
Parent PACV Score, % (n)	
0–49 (Non-Hesitant)	24 (12)
50 or greater (Hesitant)	76 (38)
Prior Parent-Clinician Vaccine Discussion, % (n)^a	85 (29)

^aMissing data.

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TABLE 2Clinician Initiation Format for Influenza vs. Other Childhood Vaccine Recommendations^a

		Influenza Vaccine		
	Initiation Format	Presumptive, n	Participatory, n	Total, n (%)
Other Childhood Vaccines	Presumptive, n	15	9	24 (73)
	Participatory, n	4	5	9 (27)
	Total, n (%)	19 (58)	14 (42)	33 (100)

^aIncludes 33 visits during which the clinician initiated recommendations for both influenza and other childhood vaccines.

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