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Kansas Family Physicians Perceptions of Parental Vaccination Hesitancy

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ABSTRACT

Introduction. In the past few decades, patients expressing the idea that vaccines are unsafe or unneeded have been experienced increasingly by physicians and other healthcare providers. Discussions with patients regarding their reasons for vaccine refusals are important, as it may provide information that can be utilized in an intervention to increase vaccination rates and combat the spread of diseases that are making a resurgence in the United States. The main objective of this study was to explore the perceptions of family physicians as to why parents in Kansas may be vaccine hesitant.

Methods. An electronic survey was distributed to family physicians in the State of Kansas via the University of Kansas School of Medicine-Wichita Family Medicine Research and Data Information Office (FM RADIO). Several aspects of physician perceptions regarding patients' vaccine hesitancy were measured in this study, including vaccines that are most often refused, reasons for refusing vaccinations, as well as what responses physicians employ when presented with vaccine concerns.

Results. The majority of physicians surveyed have experienced vaccine hesitancy or refusal in their practice, and the human papillomavirus (HPV) and flu vaccines were reported to be the primary vaccines refused for children. In addition, physicians reported frequently employing various practices in response to vaccine refusals, including requiring parents to sign a form (40%) and dismissing families from their practice (1.5%). Physician perceptions on the reasons as to why parents/guardians refuse vaccinations also were measured, and the most common response was that parents possess a fear of long-term complications for their children as a result of vaccines (74%). Additionally, the three most commonly refused vaccines were HPV, influenza, and measles, mumps, and rubella.

Conclusion. Physicians must not only deal with time constraints that vaccine hesitant discussions require, but also must try and implement discussions or interventions suited to the varying reasons why parents/guardians refuse vaccines to convince parents of their safety. The results suggested that vaccine refusals by parents/guardians seemed to be affecting Kansas family physicians' clinics in more than one way. This study could be a useful tool to help physicians better understand why vaccine refusals occur and be able to combat unwarranted concerns about vaccines. ***Kans J Med 2020;13:248-259***

INTRODUCTION

Vaccines have been a primary line of defense against viral infections for well over a hundred years, leading to millions of lives having been saved.[1] Immunizations against viruses, such as smallpox and polio, led to better control of diseases that devastated worldwide populations in the 18th and 19th centuries.[2] Although many of these illnesses, also called "vaccine preventable diseases", have declined in frequency over the past decades due to routine recommended immunizations of children and adults, these crucial elements of protection against viral infections have come under fire by people claiming vaccines are dangerous or unnecessary.[3]

Physicians reported that families are declining to vaccinate their children, citing short- and long-term side effects, as well as neurological complications, as primary concerns for receiving common immunizations.[2-4] Another major player in the vaccine refusal movement is the now debunked theory that vaccines can cause autism.[5] Even though this claim has been refuted by numerous scientific studies, parents have continued to use this argument, as well as others, to either not vaccinate or under vaccinate their children.[6-10]

Since the introduction and application of vaccines, there has been a sharp decrease in the prevalence of viral illnesses, such as polio, measles, and pertussis, which may have led to a level of desensitization in parents with regards to these diseases.[11] Parents may not have been exposed to the devastating effects of the aforementioned diseases leading to a lessened understanding of why a child may need a certain vaccine. Although in today's world, widespread epidemics like those of the 20th century and before are not as common, vaccine refusals have led to localized outbreaks in certain areas of the U.S.[12] This has led to a heightened concern about the well-being of children across the country.

In addition to the above reasons, exemption policies of certain states have given some parents legal routes to not vaccinate their children for public school enrollment. Parents may cite religious reasons as a cause for their children not receiving the proper immunizations required by public schools in 45 states.[13] Fifteen states also allow for parents to document personal or philosophical beliefs as motives for not vaccinating their children. Unsurprisingly, a past study found that all states with lax vaccine exemption laws saw a higher frequency of under-vaccinated children than those with stricter regulations.[14] To illustrate, according to the Kansas Department of Health and Environment (KDHE), all childcare facility attendees and public-school students must meet a required immunization protocol unless they provide one of two documents: a written statement signed by a physician stating that due to the physical condition of the child, inoculations may endanger the life of said child; or a statement signed by a parent or guardian that says their child is an adherent of a religious practice that does not allow them to receive required immunizations.[15] If parents choose to exempt their children from immunizations, these decisions, in turn, could lead to an increased risk of outbreaks of vaccine preventable diseases, as evidenced in a meta-analysis by Phadke and colleagues regarding the outbreak of measles and pertussis in unvaccinated populations after the elimination of both diseases in the United States.[16]

Although an increasingly negative opinion of vaccines and lax immunization laws have been observed in recent times, an effective

safeguard against vaccine hesitancies is a primary care healthcare provider who discusses the importance of immunizations with parents. According to Chung and colleagues[17], most parents who accepted or delayed vaccines reported that their physician's personal recommendation made them more likely to vaccinate their child. Additionally, a study done on the sources and credibility of vaccine information saw that parents felt that their children's physician was their most trusted source of immunization information.[18] In light of these facts, family physicians and pediatricians appear to be held in high regard by parents when it comes to information about immunizations and seem to be an influential part of health decisions made by the parent/guardian as it relates to their child.

Considering that primary care physicians are a valuable source of knowledge and an often-trusted confidant for most parents, a worthwhile area to investigate is the physician perspective on vaccine hesitancy. Although there is a large amount of prior literature on vaccine safety and the reasons as to why parents do not vaccinate,[19-22] fewer studies have investigated physician perceptions on this issue and how parental vaccine hesitancies have influenced their practice. This study sought to determine whether family physicians in Kansas have seen an increase in the frequency of parental refusal of vaccinations, how physicians handled these types of inquiries from parents, how physicians educated caregivers about vaccines, as well as physician perceptions as to the reasons why parents/guardians refused or delayed vaccinations.

METHODS

Designing the Questionnaire. An electronic survey utilizing the online platform SurveyMonkey® was sent to all eligible family physicians in the state of Kansas via the University of Kansas School of Medicine-Wichita's (KUSM-W) Department of Family and Community Medicine's (DFCM) Family Medicine Research and Data Information Office (FM RADIO). The FM RADIO system is composed of physicians who have graduated from one of the three residency programs affiliated with the KUSM-W DFCM from 1970 to 2019. The survey employed was adapted from a previous study completed on physician perceptions of parental vaccine concerns and intervention techniques by Kempe and colleagues.[23] The original survey was modified to fit the demographic characteristics of the physicians included in the sample and to achieve the goals of this survey while retaining a 26-item format.

This modified survey (Appendix) was used to assess participant perceptions, practices, and observations of immunizations, as well as the tendencies among parents/guardians in the state of Kansas. Variables assessed included demographics to understand the settings in which participants practice and their patient population. Another primary intention was to analyze the frequencies in which Kansas family physicians see vaccine refusals and concerns within their practices. These ideas were represented through questions like "On average, in a year in your practice, what percentage of parents/guardians refuse routine immunizations for their children?", as well as "What is your perception of the concerns regarding vaccinations compared to 10 years ago?". Additionally, it was important to determine the observed reasons behind these refusals to understand parental feelings toward vaccinations in Kansas family practices. We also included the responses employed by physicians regarding parent/guardian vaccination requests which was comprised of questions such as "How often do you require parents/guardians to sign a form if they refuse immunizations?".

Further, the attitudes and obstacles physicians have when communicating vaccination information to parents/guardians were assessed, with questions measuring respondents' comfort level with addressing vaccination concerns and whether time constraints ever stop them from discussing vaccinations. Last, participants were asked about the types of persuasion techniques that were used in clinic when trying to convince parents of the safety of vaccinations. Questions over parental reasons for refusal, physician responses, communication obstacles, and effective persuasion strategies employed 3-, 5-, and 7-point Likert-scale type questions, while other queries used multiple choice and drop-down models. Overall, this survey was designed to gather a large amount of information from our participants without distributing an overly populated questionnaire. All questions and response types were reviewed and approved by family medicine faculty.

Data Collection. Eligible participants were those who have elected to participate in FM RADIO and who consented to participate in the survey. Due to the nature of the FM RADIO system, all responses are obtained through a convenience sample of those who consent to participate. Informed consent is given at the beginning of the survey and consent is indicated by completion. The survey included identifiers only as needed for second and third requests to be sent to non-responders, and all responses have been de-identified. This study was approved as non-Human Subjects research by the University of Kansas School of Medicine Institutional Review Board.

The survey was sent to 561 potential respondents. All potential respondents were emailed up to three times over a four-week period of time. These potential respondents were graduates of KUSM-W DFCM family medicine residency programs at Wesley Medical Center, Ascension Via Christi, and Smoky Hill-Salina who were practicing in the State of Kansas, as well as current residents and faculty at KUSM-W DFCM and the three residency programs. Of those 561 potential respondents, 28 (5%) emails were undeliverable; 22 (4%) had unsubscribed previously from receiving SurveyMonkey® surveys for a total of 511 recipients for the survey. Following delivery, 285 recipients (56%) did not open the survey email. This meant that a total of 226 potential participants (44%) opened the survey email, and 89 responded for a 39% participation rate. Twenty-four respondents were screened out of the data after indicating they did not provide childhood vaccines in their office or they have not seen a vaccine refusal in the last year. This left a pool of 65 respondents for data analysis (Figure 1).

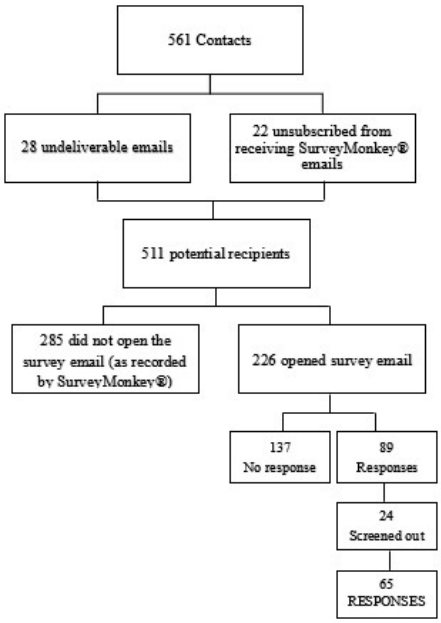

Figure 1. Participant consort chart.

Data Analysis. Only surveys that were completed in their entirety were included in the analysis, for a total of 65. Responses to the survey questions were analyzed using SPSS (v. 26.0, Chicago, Illinois). Descriptive frequencies were used to represent demographic variables. Chi-square analyses were used to compare variables of interest at the 0.05 level. Variables compared were age, gender, and location, and only significant results were described.

RESULTS

Participants. Table 1 shows the characteristics of the physician respondents. Over half of respondents (51%) reported their age to be between 35 to 54 with a large portion of respondents practicing in Sedgwick county (46%) and in an urban setting (41%). Approximately 32% of physicians (n = 28) reported their practice arrangement to be a single/multi-specialty practice owned by a hospital/health system. The vast majority of respondents reported having no concerns about any negative risks about vaccines (80%), with nine (10.1%) reporting rare adverse reactions as their cause of concern.

Respondent Practice Demographics. A large portion of those surveyed reported notable populations of patients who are on Medicare (82%), Medicaid/CHIP (67.4%), or were uninsured (38.2%), as well as patients who are Hispanic/Latino (42.7%), and African American/Black (30.3%). Most respondents also reported patient socioeconomic status (income, education, access to resources) to be either about average (48.3%) or lower than average (38.2%). Patient education levels were more likely to be higher in suburban and urban practice locations than mid-size or small rural locations [58.5% versus 41.5%; $\chi^2(6) = 25.9$, $p < 0.0001$], as well as patients in suburban and urban settings having more access to resources [$\chi^2(6) = 15.8$, $p = 0.01$], however, there was no significant difference for patient income across the various community settings. Table 2 shows the patient demographic patterns within physician respondent practices.

Table 1. Respondent demographics (n = 89).

	n	%
Age		
25 to 34	20	22.5
35 to 44	24	27.0
45 to 54	22	24.7
55 to 64	15	16.9
65 to 74	8	9.0
Gender		
Male	46	51.7
Female	43	48.3
Remained in residency program location		
Yes - Sedgwick county (Wesley and Ascension Via Christi)	46	51.7
Yes - Saline county (Smoky Hill - Salina)	6	6.7
No	37	41.6
Practice location type		
Small rural (less than 19.9 people/sq. mile)	16	18.0
Midsize rural (between 20 and 39.9 people/sq. mile)	21	23.6
Suburban (between 40 and 149.9 people/sq. mile)	11	12.4
Urban (more than 150 people/sq. mile)	41	46.1
Current practice arrangement		
Single/multi-specialty practice owned by hospital/health system	28	31.5
Ownership stake in a family medicine group practice	15	16.9
Resident or in a fellowship	7	7.9
Employed by a government entity	7	7.9
Practice owned by physicians and I have no ownership stake	7	7.9
Medical school or residency faculty	7	7.9
Own solo practice	6	6.7
Ownership take in a multi-specialty practice	5	5.6
Other (volunteer, locums, contract provider)	7	7.9
Concern about negative risks of vaccines		
No concerns	80	89.9
Yes, I have concerns	9	10.1

Physician Behaviors Regarding Vaccine Hesitancy. Sixty-seven physicians indicated that they had experienced a vaccine refusal (75.2%), and eight physicians reported that at least 10% of their patients had requested to delay vaccines for their children in the last year. Figures 2 and 3 show the percentages of parents who either refused a vaccine for their children or asked to spread the vaccines out over a longer period of time, with the majority of physicians having less than 4% of patients making this request. Thirty physicians (44.8%) reported seeing an increase in the number of concerns regarding vaccinations as compared to 10 years ago. Additionally, physicians between the ages of 35 and 54 were more likely than the other age groups to say they have seen a significant increase in concerns about vaccines among parents/guardians in the last 10 years [22.5% versus 77.5%; $\chi^2(12) = 35.3$, $p < 0.001$]. Male physicians were also more likely to report they have seen a change in vaccination concerns as compared to 10 years ago [51.7% versus 48.3%; $\chi^2(3) = 9.9$, $p = 0.02$].

Table 2. Respondent practice demographics (n = 89).

	n	%
More than 10% of total patient population is...		
On Medicare	73	82.0
On Medicaid/CHIP	60	67.4
Hispanic or Latino	38	42.7
Uninsured	34	38.2
African American or Black	27	30.3
Asian	6	6.7
Native American	0	0.0
Physician estimate of overall patient income		
Lower than average	44	49.4
About average	35	39.3
Higher than average	7	7.9
No answer	3	3.4
Physician estimate of overall patient education level		
Lower than average	33	37.1
About average	45	50.6
Higher than average	11	12.4
Physician estimate of overall patient access to resources		
Lower than average	34	38.2
About average	43	48.3
Higher than average	12	13.5
Physician estimate of overall patient socioeconomic status		
Low	33	38.2
Average	46	48.3
High	10	13.5
Childhood vaccines administered in office†		
Yes	69	77.5
No	20	22.5
Vaccine refusals in office†		
Has occurred	65	73.0
Screened out of survey	24	27.0

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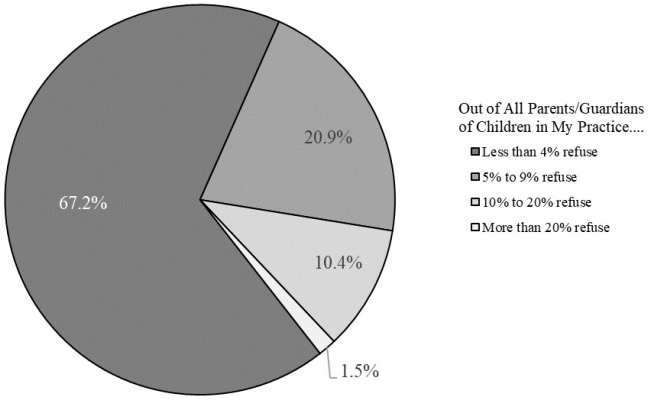

Figure 2. Percentage of physicians reporting vaccine refusals by parents/guardians.

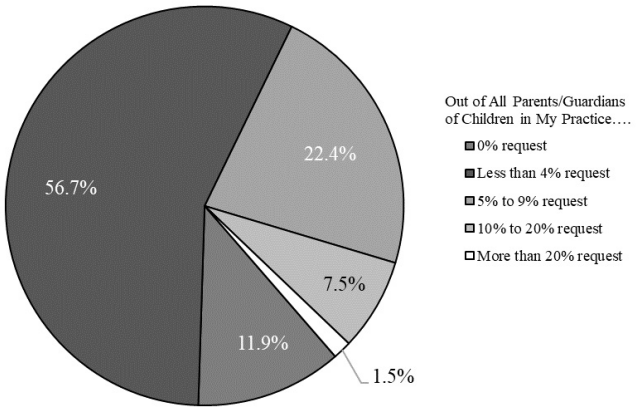

Figure 3. Percentage of physicians reporting requests by parents/guardians to delay vaccines.

With this in mind, 40% of physician respondents (n = 26) stated that they usually or almost always require parents/guardians to sign a vaccine refusal form if they refuse immunizations, and 64 (98.5%) reported that they seldom or never dismiss families from their practice if they refuse immunizations. Forty-four physicians (66.1%) also reported that they often to almost always spread out vaccinations when parents request it (Table 3).

Parent Beliefs Regarding Vaccinations. When asked their perceptions on why parents were hesitant to allow their children to be vaccinated, 73.8% of respondents indicated that the potential for long term complications was the number one reason for parents refusing or delaying vaccines, followed by the idea that thimerosal caused ill effects (66.2%), and that their child was unlikely to acquire the disease for which the vaccine was being provided (55.4%). Parents were less likely to refuse based on the belief that vaccines weakened their child's immune system or that vaccines can cause a problematic, high immunogenic load on their child. See Table 3 for specific responses.

Physicians were asked which vaccines they felt were most likely to be refused. The majority indicated that the HPV vaccine was the most commonly refused (33.5%), followed by influenza (24.3%), and the measles, mumps, and rubella vaccine (MMR; 15.%). Physicians reported that parents were less likely to refuse the Haemophilus influenza type B (Hib; 0%), the pneumococcal polysaccharide (PPSV23; 0.5%), or the hepatitis A (Hep A; 1.1%) vaccines (Table 4).

Table 3. Behaviors and beliefs regarding vaccinations (n = 65).

Physician behaviors	Never	Seldom	Sometimes	Often	Usually	Almost always	Missing
Require a form signed if they refuse immunizations	36.9%	6.2%	16.9%	0.0%	12.3%	27.7%	---
Address immunization concerns at a prenatal visit	12.3%	10.8%	20.0%	15.4%	9.2%	29.2%	3.1%
Dismiss from practice if they refuse immunizations	83.1%	15.4%	0.0%	0.0%	0.0%	1.5%	---
Agree to spread out vaccinations when requested	1.5%	4.6%	27.7%	9.2%	27.7%	29.2%	---
Send information about immunizations before visits	72.3%	12.3%	9.2%	1.5%	1.5%	3.1%	---
Schedule an extra visit to address immunization concerns	32.3%	38.5%	23.1%	0.0%	1.5%	4.6%	---
Refer to a health professional with expertise in vaccinations	86.2%	7.7%	1.5%	3.1%	0.0%	1.5%	---
Hold group information meetings about vaccine safety	95.4%	3.1%	1.5%	0.0%	0.0%	0.0%	---
Parental beliefs							
Child will suffer long-term complications from vaccines	1.5%	9.2%	15.4%	16.9%	41.5%	15.4%	---
Child could develop autism	7.7%	24.6%	27.7%	27.7%	10.8%	1.5%	---
There are possible ill effects of thimerosal	3.1%	6.2%	23.1%	30.8%	18.5%	16.9%	1.5%
Child is unlikely to get a vaccine preventable disease	6.2%	10.8%	27.7%	21.5%	15.4%	18.5%	---
Vaccines will weaken their child's immune system	24.6%	35.4%	26.2%	7.7%	4.6%	1.5%	---
VPDs are not severe enough to warrant immunization	6.2%	20.0%	29.2%	18.5%	18.5%	7.7%	---
Child will suffer immediate, short-term effects	6.2%	26.2%	27.7%	13.8%	16.9%	7.7%	1.5%
Immunizations are driven by drug company profits	15.4%	10.8%	36.9%	20.0%	7.7%	9.2%	---
Vaccines are not very effective	12.3%	29.2%	26.2%	20.0%	9.2%	3.1%	---
There will be a problematic, high immunogenic load on child due to vaccines	27.7%	18.5%	26.2%	13.8%	9.2%	4.6%	---

Table 4. Commonly refused routine childhood vaccinations.

	n	%
Human Papillomavirus (HPV)	62	33.5
Influenza (flu)	45	24.3
Measles, mumps, and rubella (MMR)	28	15.1
Meningococcal Conjugate (MenACWY)	12	6.5
Hepatitis B (HepB)	11	5.9
Varicella (VAR)	7	3.8
Diphtheria, Tetanus, & Acellular Pertussis (DTaP)	6	3.2
Serogroup B Meningococcal (MenB)	6	3.2
Rotavirus (RV)	3	1.6
Inactivated Poliovirus (IPV)	2	1.1
Hepatitis A (HepA)	2	1.1
Pneumococcal Polysaccharide (PPSV23)	1	0.5
Haemophilus Influenza Type B (Hib)	0	0.0
Total responses	**185**	

Communication Between Physician and Patient. Physicians' attitudes toward communication with parents/guardians about the risk and benefits of vaccines was assessed. Forty-six physicians (70.8%) reported that they feel comfortable addressing parents/guardians' questions or concerns about vaccines. Twenty-nine respondents (44.6%) also reported that, when parent/guardians do not adhere to their recommendations regarding immunizations, it shows a lack of respect for the physicians' medical judgment and experience. In addition, 53 respondents (81.5%) strongly disagreed with the statement that "I have considered no longer administering immunizations in my practice because of the burden of discussing vaccine risks and benefits with parents/guardians." The most effective form of communication used to convince parents to vaccinate their children indicated by respondents was to tell parents that it is safer to vaccinate their children than to not vaccinate (29.2%). The next most effective form of communication was a discussion of morbidity and mortality associated with vaccine preventable disease (27.7%).

Barriers to Communication. Barriers to communication between vaccine hesitant parents/guardians and physicians were reported. Thirty-two physicians (51.6%) reported that the amount of time vaccine discussions take with vaccine hesitant parents stopped them from discussing immunizations at least some of the time. Forty-four physicians (71.4%) reported that other health issues taking precedence during visits prevented them from discussing vaccinations with hesitant parents, and 59.7% of physicians (n = 37) reported that vaccine discussions are unlikely to change a parent/guardian's mind. The majority reported that their own personal lack of knowledge about risks and benefits of vaccines and not knowing how to communicate risk with the parent/guardian rarely factored into having conversations with parents.

DISCUSSION

This study provided an additional perspective on how family physicians perceive parental refusal of vaccinations. Our study was unique in reporting the types of vaccines that are refused most often by parents in Kansas, as well as looking at the various reasons vaccines are refused or delayed. The methods used by Kansas family physicians to address parental hesitancies or refusals is another distinctive aspect of this study; the results of which may aid doctors in alleviating the vaccine refusal issue.

One specific goal of this study was to gain a better understanding of whether vaccine refusals occur in the state of Kansas. Within our study, most physicians who reported administering vaccines had experienced a vaccine refusal at some point during their career, which was consistent with prior literature.[3,24] Nearly 45% of physicians reported an increase in the level of concern for parents refusing vaccinations and most physicians surveyed reported that there is a proportion of parents who refuse vaccinations for their children.

In addition to outright refusals, reasons for vaccine refusals or delays were another finding of this study. Some parental concerns, such as the link between vaccines and autism, were used as a reason for vaccine refusal. This specific concern highlighted the idea that flawed scientific research can cause enduring damage for doctors in the clinic.[25-28] It can be hard to convince parents to let go of the sensationalist ideas that they may hold, and our study showed that physicians were continuing to convince parents that these types of concerns are unwarranted.

It may be of use to target misinformation regarding the safety and efficacy of vaccines that are refused most often. The HPV and flu vaccines were the top two most commonly refused vaccines in a study by Gilkey and colleagues[29], which indicated that more education is needed regarding the purpose of specific vaccinations. According to a previous study, parents who did not want to accept an HPV vaccine did so because they felt their daughter was too young to be sexually active, that it was not needed, or because they were worried about the safety of their child.[30] Additionally, the flu vaccine must be given on an annual basis, which may lead to an increased rate of refusal due to the multiple number of times this vaccine is presented to patients or parents/guardians. The MMR inoculation is one with more classical implications for refusal, due to misinformation on the internet or the fraudulent study by Andrew Wakefield in 1998 discussing the idea that vaccines led to autism, which has since been debunked.[31] Varying types of interventions are needed to convince parents of vaccine safety and efficacy.[32,33]

Once parents refuse vaccines, 83% of physicians reported that they never dismiss families from their practice, which is similar to a prior study done by O'Leary and colleagues.[24] This study indicated that only about one fifth of physicians dismiss families from their practice after refusing a vaccine. A question of ethics has argued for and against letting physicians dismiss families from their practice for refusing vaccines, and our study indicated that many family physicians in Kansas are reluctant to dismiss families from their practice.[34,35]

Before determining whether to dismiss families or what responses to employ as a result of vaccine refusals, it is important for physicians to understand how vaccine refusals affect their clinic as a whole. Although more research is needed to find out more specifically how vaccine hesitancy affects the clinic, it is clear that vaccine refusals indeed affected the amount of time that a physician can spend with a patient. Nearly 77% of physicians in our study reported spending at least an additional five minutes with parents/guardians who expressed concerns about vaccines during an office visit, which is higher than a prior study.[23] These disruptions could not only interrupt the flow of clinic, but also limit the amount of time that nursing staff and physicians can spend with other patients in the practice.

Due to vaccine refusals causing a disruption of clinical flow, it is important for physicians to understand what implementations or communication practices are the most helpful when addressing parental vaccine refusals. The physicians surveyed agreed that establishing trust with parents/guardians is important, which lends itself to the idea that trust is needed for physicians to be able to convince parents/guardians that vaccines are safe and warranted.

A final point of interest is the role political practices may play in vaccine dissemination and on the opinions parents may hold of vaccine safety. As recently as February 10, 2020, a bill to repeal Kansas Statutes Annotated (KSA) 65-508 and 72-6262 was introduced.[36] These two statutes contain information relating to the requirement of vaccinations for all children in childcare facilities or who are of school age, and who do not receive one of the two methods of exemption. This bill, HB 2601, would allow the Secretary of the Kansas Department of Health and Environment the authority to require additional vaccinations for a short period of time should there be an imminent public health risk, but adding new vaccines to the annual required list would require legislative approval. This is of concern as it has the potential to politicize further public health decisions and could influence parent decisions in vaccine compliance.

Limitations and Future Studies. This study involved family physicians throughout the State of Kansas who are KUSM-W Family Medicine residency program graduates, faculty physicians, and resident-physicians, and the small sample size limits generalizability of the findings. Additional limitations included a potential response bias due to the fact that some individuals who opened the study email did not complete the survey. These individuals may have had differing responses from our study participants due to personal feelings or beliefs regarding vaccines. Furthermore, our study only surveyed family physicians and it is known that other healthcare professionals administer vaccines, and these different groups of individuals could have varying opinions and beliefs regarding vaccine hesitancy and/or refusals. A more diverse study sample will lead to more understanding of family physicians' perceptions of vaccine hesitancy and refusals. More reliable, evidence-based studies need to be done to inform clinical decision making regarding how best to provide care to patients. Future studies should include surveys of parents who are vaccine hesitant, as well as specific plans for intervention with vaccine hesitant patients; however, since the clarity on which interventions were best in convincing parents was vague as seen in other studies, more information may be needed to develop the best plan of action in combatting parental hesitancy to vaccines.[37,38]

CONCLUSION

While there has been prior research in Kansas regarding vaccine tendencies within the last 10 years,[39-43] there was not a large body of literature that delves into the reasons why parents may refuse or delay vaccinations for their children, as well as how physicians are dealing with this issue. Future studies are needed to expand the knowledge in this area, not only for Kansas, but for similar locations that may experience the same issues. More research is planned to include pediatricians and internal medicine specialists who may provide childhood vaccines in their offices.

Physicians agree that there is an issue with inadequate vaccination rates in the state of Kansas. As health care providers, physicians are considered to be knowledgeable about vaccinations and are more likely to succeed in helping patients make informed health care decisions.[17,18] Our data suggested that most family physicians do not "push back" against vaccine hesitancy or refusal with their patients, even though many recognize this is a public health issue.[1,2,14,43] In addition, the top three reasons parents chose to not vaccinate their children were concerns for long term complications, the ill effects of thimerosal, and the unlikeliness of their child to contract a vaccine preventable disease. Patient education and better persuasive methods may be needed to communicate vaccine safety and efficacy. Furthermore, different vaccine refusals may require different types of interventions to convince individuals of vaccine safety and efficacy. HPV, influenza, and MMR were the top three vaccines "refused" by parents/guardians and each may have different reasons for refusal and may require different interventions. Barriers to communication between physicians and patients, such as the amount of time vaccine discussions take, should be addressed so that physicians have ample opportunity to provide parents/guardians with advice and recommendations on vaccinations. Physicians should continue to play an active role in communicating with patients, families, and their communities to halt the spread of misinformation regarding the efficacy of vaccinations and to increase vaccination rates in Kansas. Future efforts should focus on education for health care providers, as well as patients, on intervention strategies that target vaccine hesitant parents/guardians, and on adding to the body of literature regarding the importance of routine vaccinations.

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Keywords: vaccination refusals, vaccinations, family physicians, vaccines, Kansas

APPENDIX

Kansas Family Physicians Perceptions of Parental Vaccination Hesitancy Survey

1. What is your age?

a. 24 or younger
b. 25 - 34
c. 35 - 44
d. 45 - 54
e. 55 - 64
f. 65 - 74
g. 75 or older
h. Prefer not to answer

2. What is your gender?

a. Male
b. Female
c. Prefer not to answer
d. Other_____

3. In which Kansas county do you primarily practice? _____

4. In what kind of community do you primarily practice in?

a. Urban
b. Suburban
c. Midsize Rural
d. Small Rural

5. Which most closely describes your current medical practice arrangement?

a. I own my own solo practice.
b. I have ownership stake in a family medicine group practice.
c. I have ownership stake in a multi-specialty practice.
d. I work for a practice owned by physicians and I have no ownership stake.
e. I am in a single or multi-specialty practice owned by a hospital or health system.
f. I am employed by a government entity (federal, state, county, etc.).
g. I am a resident physician or in a fellowship position.
h. Other - (*please specify*)_____

6. When thinking of your patient population, are more than 10% *(please select all that apply)*:

On Medicaid/CHIP	☐	African American/Black	☐
On Medicare	☐	Hispanic/Latino	☐
Uninsured	☐	Asian	☐

7. At what level in each category would the majority of your patients be?

	Lower than Average	About Average	Higher than Average
a. Income	☐	☐	☐
b. Education Level	☐	☐	☐
c. Access to Resources	☐	☐	☐

8. Are you, as a physician, concerned about any potential negative risks of vaccines?

a. No
b. Unsure
c. Yes *(please specify)*_____

9. Do you administer childhood vaccines in your office?

a. Yes (Please continue with the survey.)
b. No (Thank you. This is the end of the survey.)

10. Have you ever had a vaccine refusal in your practice? This is when a parent or guardian of a child younger than 18 has refused a routine immunization for their child.

a. Yes (Please continue with the survey.)
b. No (Thank you. This is the end of the survey.)

11. On average, in a year in your practice, what percentage of parents/guardians refuse routine immunizations for their children?

a. 0%
b. 1 - 4%
c. 5 - 9%
d. 10 - 20%
e. 20% or more

12. On average, in a year in your practice, what percentage of parents/guardians request to spread out vaccines for their children?

a. 0%
b. 1 - 4%
c. 5 - 9%
d. 10 - 20%
e. 20% or more

13. What is your perception of the concerns regarding vaccinations compared to 10 years ago?

a. Concerns have decreased.
b. Concerns are unchanged.
c. Concerns have increased.
d. I have not been in practice for more than 10 years.

14. From your experience, which three immunizations do you feel are refused most often by parents/guardians? *(Please select only three options below.)*

Hepatitis A (HepA)	☐	Rotavirus (RV)	☐
Hepatitis B (HepB)	☐	Diphtheria, Tetanus, & Acellular Pertussis (DTaP)	☐
Haemophilus Influenzae Type B (Hib)	☐	Varicella (VAR)	☐
Human Papillomavirus (HPV)	☐	Pneumococcal Conjugate (PCV13)	☐
Meningococcal Conjugate (MenACWY)	☐	Pneumococcal Polysaccharide (PPSV23)	☐
Serogroup B Meningococcal (MenB)	☐	Inactivated Poliovirus (IPV)	☐
Measles, Mumps, Rubella (MMR)	☐	Influenza	☐
Other?_____			

15. In your experience, how much do each of the following concerns/beliefs contribute to vaccine refusal among parents/guardians?

	Never	Seldom	Sometimes	Often	Usually	Almost Always
Belief that their child will suffer long-term complications from vaccines.	☐	☐	☐	☐	☐	☐
Belief that their child could develop autism.	☐	☐	☐	☐	☐	☐
Belief that there are possible ill effects of thimerosal.	☐	☐	☐	☐	☐	☐
Belief that their child is unlikely to get a vaccine-preventable disease such as measles, mumps, etc.	☐	☐	☐	☐	☐	☐
Belief that vaccines will weaken their child's immune system.	☐	☐	☐	☐	☐	☐
Belief that vaccine-preventable diseases are not severe enough to warrant immunization.	☐	☐	☐	☐	☐	☐
Belief that their child will suffer immediate, short-term effects (such as fever, pain, excessive crying, or seizure).	☐	☐	☐	☐	☐	☐

15. In your experience, how much do each of the following concerns/beliefs contribute to vaccine refusal among parents/guardians?
cont.

	Never	Seldom	Sometimes	Often	Usually	Almost Always
Belief that immunization recommendations are driven by profit considerations of drug companies.	☐	☐	☐	☐	☐	☐
Belief that vaccines are not very effective.	☐	☐	☐	☐	☐	☐
Belief that there is a problematic, high immunogenic load that can be put on a child as a result of vaccines.	☐	☐	☐	☐	☐	☐
General worries about vaccines without a specific concern.	☐	☐	☐	☐	☐	☐

Other concern or belief that contributes to vaccine refusal?_____

16. How often do you do the following?

	Never	Seldom	Sometimes	Often	Usually	Almost Always
Require parents/guardians to sign a form if they refuse immunizations.	☐	☐	☐	☐	☐	☐
Address immunization concerns as a prenatal visit.	☐	☐	☐	☐	☐	☐
Dismiss families from your practice if they refuse immunizations.	☐	☐	☐	☐	☐	☐
Agree to spread out vaccinations when parents request it.	☐	☐	☐	☐	☐	☐
Send information about immunizations to parents/guardians before visits.	☐	☐	☐	☐	☐	☐
Schedule an extra visit solely to address immunization concerns.	☐	☐	☐	☐	☐	☐
Refer parents/guardians who are concerned about immunization safety to a specific physician or other health professional in the practice with interest and expertise.	☐	☐	☐	☐	☐	☐
Hold group information meetings for parents/guardians to be educated about vaccine safety.	☐	☐	☐	☐	☐	☐

17. What are your attitudes regarding communication about the risks and benefits of vaccination?

	Strongly Disagree	Disagree	Mildly Disagree	Neither Agree nor Disagree	Mildly Agree	Agree	Strongly Agree
I feel comfortable addressing parents/guardians' questions or concerns about vaccines.	☐	☐	☐	☐	☐	☐	☐
Establishing trust is the most important part of convincing skeptical parents/guardians to accept vaccines.	☐	☐	☐	☐	☐	☐	☐
Parents/guardians who question whether or not their child should be immunized are being responsible.	☐	☐	☐	☐	☐	☐	☐
I believe my job is less satisfying because of the need to discuss parents/guardians' questions or concerns about vaccines.	☐	☐	☐	☐	☐	☐	☐
When parents/guardians disagree with a physician's recommendations regarding immunizations, it shows a lack of respect for the physician's medical judgement and experience.	☐	☐	☐	☐	☐	☐	☐
I have considered no longer administering immunizations in my practice because of the burden of discussing vaccine risks and benefits with parents/guardians.	☐	☐	☐	☐	☐	☐	☐

18. When parents/guardians express concerns about vaccines during an office visit, do you spend additional time with them?

a. I do not spend any additional time with parents who express concerns about vaccines.
b. Yes, less than 4 additional minutes.
c. Yes, 5 to 9 additional minutes.
d. Yes, 10 to 19 additional minutes.
e. Yes, 20 or more additional minutes.

19. Which practices do you find most helpful when discussing immunizations with parents/guardians?

	Ineffective	Somewhat Effective	Very Effective
Personal statement you vaccinated (or would vaccinate your own children.	☐	☐	☐
Discussion of your experience with vaccine safety in your practice.	☐	☐	☐
Statement that you think it is safer to immunize than to not.	☐	☐	☐
Discussion of morbidity and mortality associated with vaccine preventable diseases.	☐	☐	☐
Discussion of effectiveness of vaccines in preventing diseases.	☐	☐	☐
Sharing your professional experiences with vaccine preventable diseases in your patients.	☐	☐	☐
Sharing data about the likelihood of side effects/adverse events associated with vaccination.	☐	☐	☐
Discussing the importance of vaccinating their child to protect others in the community.	☐	☐	☐
Discussing the importance of immunizations to eliminate diseases, such as polio, from the general population.	☐	☐	☐

Other practice that you find to be effective in your office? _____

20. What methods, if any, do you use to provide immunization information to parents/guardians? *(Please select all that apply.)*

Information sheets about the severity of vaccine-preventable diseases	☐
Listing of websites	☐
Pictures of children affected by vaccine preventable diseases	☐
Graphs demonstrating decreasing mortality from disease	☐
Informational videos about vaccines	☐
None	☐

Other practice that you find to be effective in your office? _____

21. How often do the following stop you from discussing immunizations with parents/guardians of children?

	Never	Seldom	Sometimes	Often	Usually	Almost Always
Amount of time the discussion will take.	☐	☐	☐	☐	☐	☐
Other health issues or parental concerns taking precedence over discussing vaccines in the office.	☐	☐	☐	☐	☐	☐
Vaccine discussions are unlikely to change a parent/guardian's mind.	☐	☐	☐	☐	☐	☐
My own personal lack of knowledge about risks and benefits of vaccines hinders effective communication with the patient.	☐	☐	☐	☐	☐	☐
Parents/guardians do no understand the risk/benefit information.	☐	☐	☐	☐	☐	☐
Not knowing how to communicate risk with the patient.	☐	☐	☐	☐	☐	☐

Other barriers that often stop you from discussing immunizations? _____

22. Finally, are there any other questions, comments, or concerns you would like to make in regard to vaccine refusals?

_____

_____

_____

Thank you for your time!