

Influences Affecting Parental Acceptance of Rotavirus Vaccine

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Introduction

Rotavirus Gastroenteritis causes severe infantile diarrhea and dehydration and is a major reasons for children hospitalization and outpatient visits worldwide. 8, 11, 29, 32 Rotavirus-induced diarrhea has resulted in an estimate of 450,000 global childhood deaths each year. 8, 11 In 1998, the US introduced a vaccine known as Rotashield. 23 However, in 1999, the vaccine was withdrawn due to its high risk of intussusception, a telescoping of a bowel segment into another. 8 In 2006, two new Rotavirus vaccines were reintroduced: RV1 and RV5. 8,23,32 Since 2006, however, there has been evidence of an increased risk of intussusception with both RV1 and RV5. Nevertheless, the benefits of the rotavirus vaccine far outweigh the small risk of intussusception. Thus, the goal of this project is to identify factors that are still causing parental hesitancy in acceptance of the vaccine.

Research Question

What factors cause parental hesitancy in acceptance of the rotavirus vaccine for their infants (<6 months old), given its well demonstrated benefits?

Primary Outcome: Identify factors contributing to rotavirus vaccine parental hesitancy.
Secondary Outcomes: Address parental concerns and decrease hesitancy in acceptance of the rotavirus vaccine. Help parents make informed decisions regarding the vaccine.

Materials and Methods

A comprehensive search was done for key words on PubMed and OvidSP. MeSH terms were combined including: "children vaccination, rotavirus vaccine, intussusception", "rotavirus vaccine, parental vaccine attitude", "vaccine parents attitudes, rotavirus vaccine", and "vaccine hesitancy" by itself. Filters including publication date within last 5 or 10 years, human species, and English language were utilized. Primary articles were screened based on titles, abstracts, and conclusions. Full texts were read for final screening. Last search was completed on August 25, 2016. Three additional articles were found through other resources and searching references of articles. A total of 32 articles supported the background and 4 articles were used in the analysis.

Figure 1: PRISMA Flow Diagram

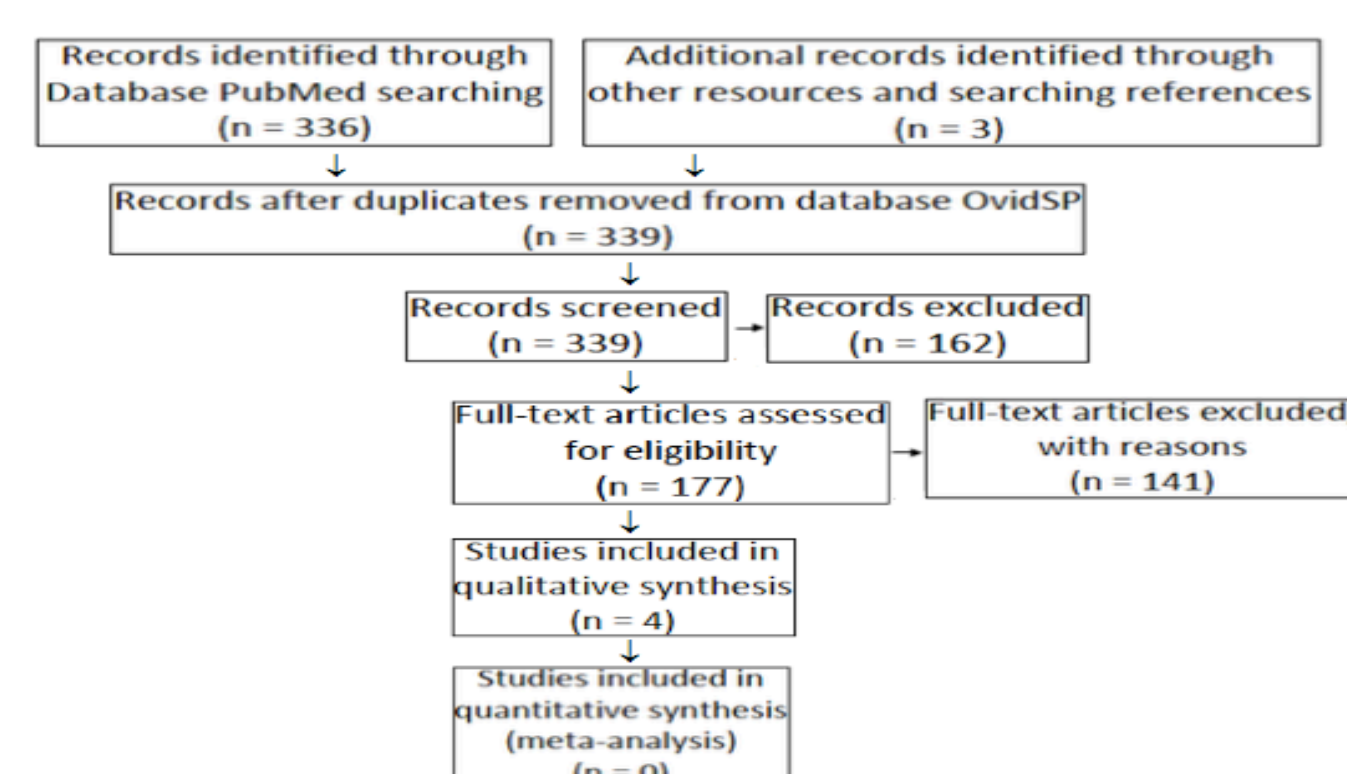


Table 1: Dubé et al. 7 Parent Characteristics	Table 2: Payne et al. 26 Parent Characteristics	Table 3: Patel et al. 26 Parent Characteristics
Canada - Quebec n = 248	Seattle, WA n = 13	CA (n = 29)
Canada - Vancouver n = 123	Rochester, NY n = 18	MO (n = 31)
Canada - Halifax n = 42	Cincinnati, OH n = 27	High School n = 5
Mother Age at Childbirth: <30 n = 34.6	Average Maternal Age (Yrs.) n = 33.2	High School n = 21
Mother Age at Childbirth: 30-39 n = 61.5	Less than High School n = 3	White n = 9
Mother Age at Childbirth: ≥40 n = 3.9	High School n = 11	Black n = 5
High School or Less n = 10.2	Some College n = 17	Asian American n = 3
College n = 26.9	College n = 16	Hispanic n = 6
University n = 62.9	Graduate Degree n = 11	Race: Other n = 3
Annual Income: <\$35,000 n = 7.7	Urban n = 20	LOC: "High", CR: "Yes" n = 8
Annual Income: \$35,000-\$75,000 n = 36.7	Suburban n = 33	LOC: "High", CR: "No" n = 7
Annual Income: >\$75,000 n = 55.7	Rural n = 4	LOC: "Low", CR: "Yes" n = 7
# of Children in Household: 1 n = 54.6	Public Insurance/Medicaid n = 19	LOC: "Low", CR: "No" n = 5
# of Children in Household: 2 n = 31.1	Private Insurance n = 35	LOC = Level of Concern about safety of childhood vaccines (i.e., "High", "Low")
# of Children in Household: >3 n = 14.3	Insurance Status: Other n = 2	CR = Child-Rearing experience raising >1 child to age 6 (i.e., "Yes", "No")
	Mean # Children in Household 2.3	

Table 4: Lugg et al. 17 Parent & Child Characteristics					
Mean Age of Children in Household	Duration of Illness (Days)	Age of Child (Years)	Child Gender Male	Child Gender Female	SES: High
Mean = 33	Mean = 2	Mean = 4	Mean = 2.5	15, 54%	13, 46%
					9, 32%
					10, 36%
					9, 32%

Results

Barriers identified causing parental rotavirus vaccine hesitancy from E. Dubé et al. 7 included: fear of side effects, cost of rotavirus vaccine, not protecting against all diarrhea, given in three doses, vaccine not included in free public programs, child receiving enough vaccines, and vaccine is not useful. Findings by Patel et al. 26 on parental awareness of rotavirus disease burden and likelihood of vaccination led to the consideration that with increased awareness of disease burden there could be increased parental acceptance of vaccine. Findings by Payne et al. 28 on mothers' Pre- vs. Post-Intervention decline in opinion of the rotavirus vaccine based on knowing that DNA fragments from Porcine Circovirus were found in RV1 and RV5 vaccines with no evidence of harm to humans demonstrated decreased acceptance of the vaccine with presentation of complex scientific information. Lugg et al. 17 found that parental concerns regarding vaccines included: immunity achieved from acquiring the virus itself, needing to evaluate data, a perceived lack of disease threat, producing a stronger mutated virus, and prevention through holistic approaches.

Barriers	(Mean ± SD)
The cost of the vaccine	2.76 ± 1.34
Having the vaccine given in three doses	2.22 ± 1.09
Fear of side effects	3.12 ± 1.29
The vaccine will not protect against all diarrhea	2.50 ± 1.18

Table 5: Parental barriers to vaccinate against rotavirus from E. Dubé et al. 7

[1: Low probability to happen or strong disagreement, 5: High probability to happen or strong agreement]

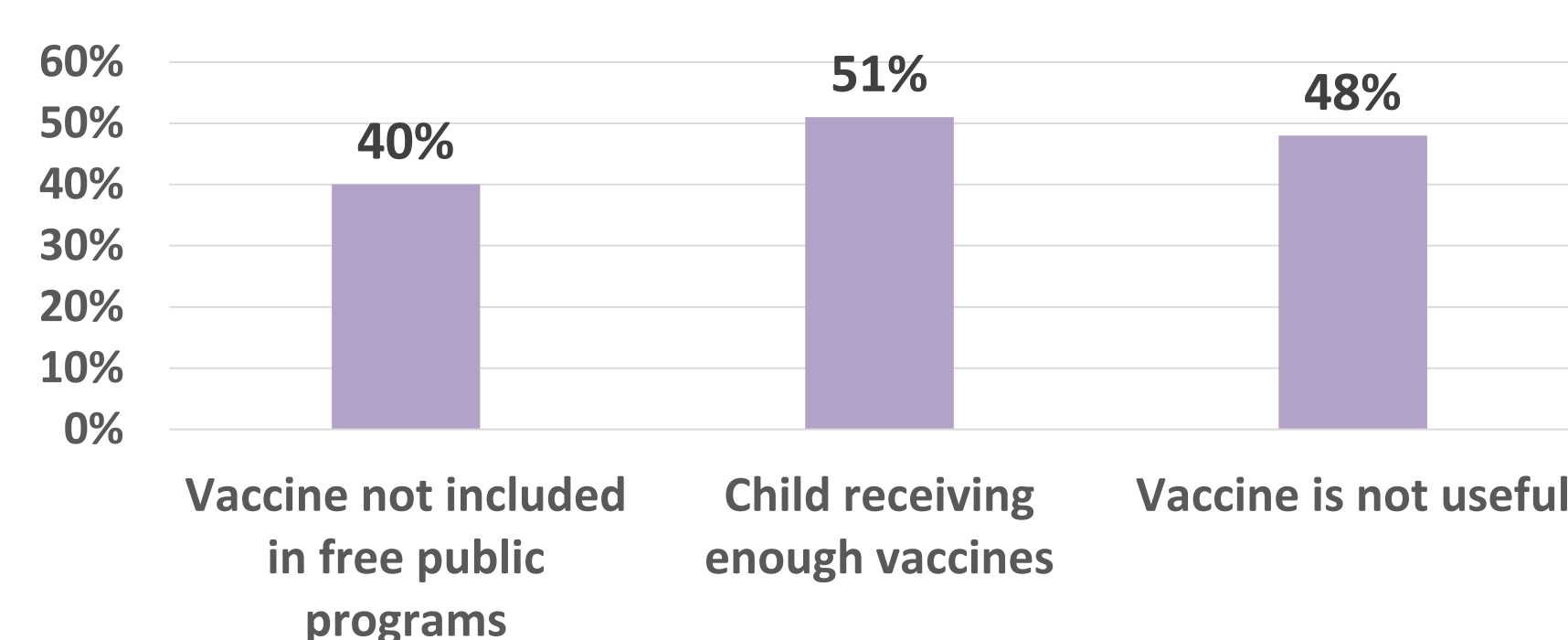


Figure 2: Mean of factors associated with parents' refusal to vaccinate against rotavirus from E. Dubé et al. 7

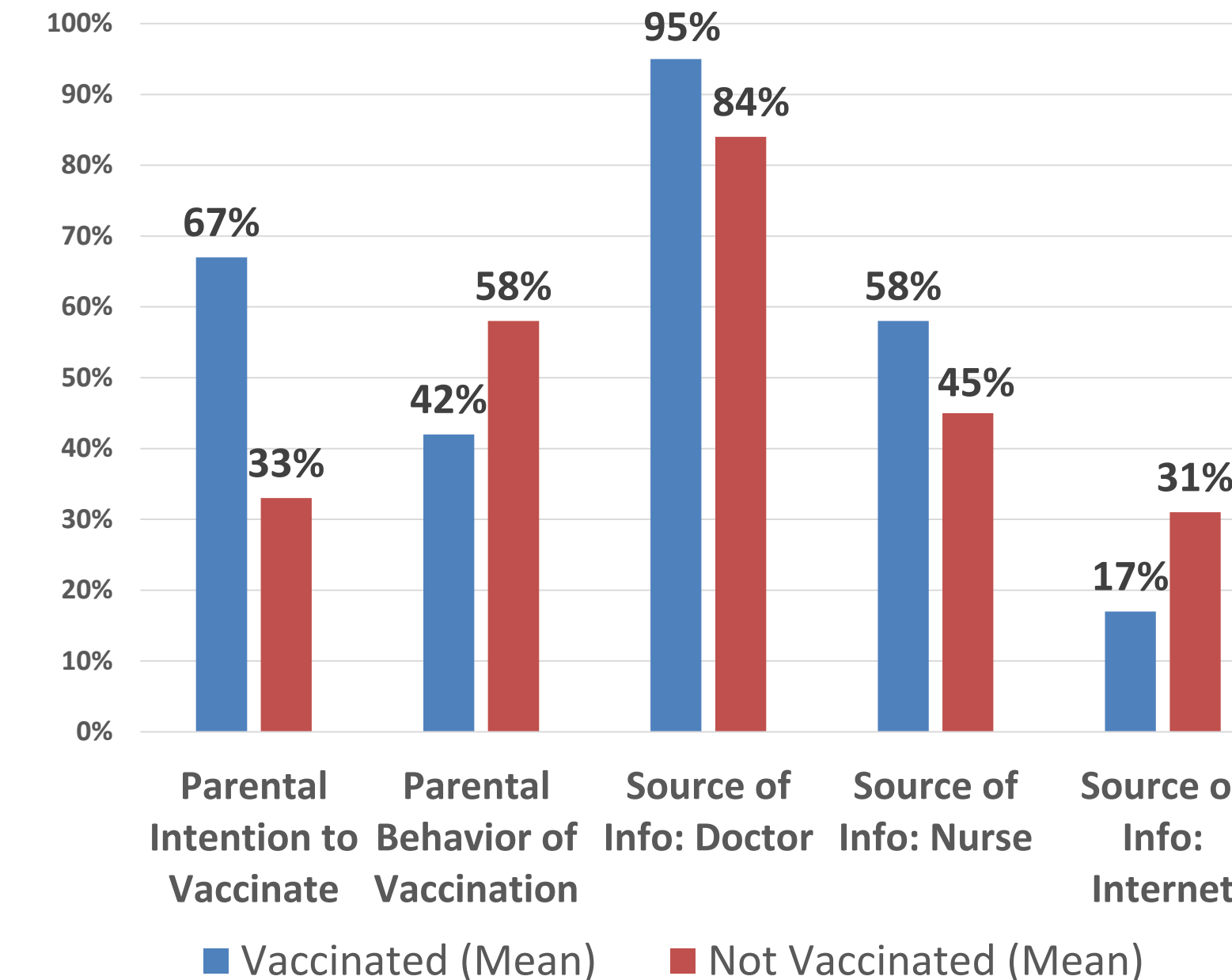


Figure 3: Mean in those vaccinated vs. not vaccinated and parents' source of vaccine information from E. Dubé et al. 7

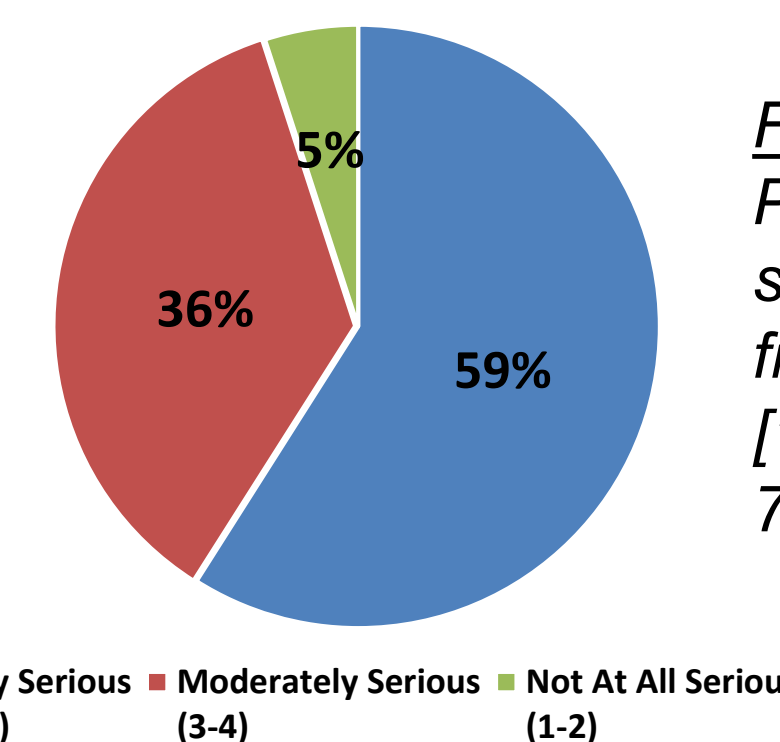


Figure 4: Parental opinion on seriousness of Rotavirus from Patel et al. 26 [1: Not at all serious to 7: Very serious]

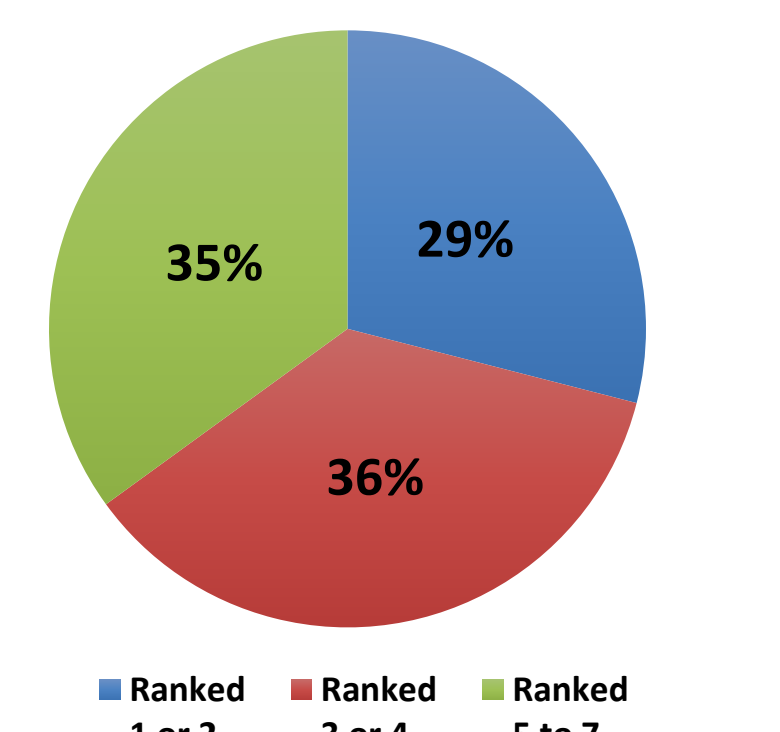


Figure 5: Likelihood of vaccinating child for Rotavirus from Patel et al. 26 [1: Definitely not get to 7: Definitely get]

	Pre-Intervention "Somewhat/Strongly Disagree"	Post-Intervention "Somewhat/Strongly Disagree"
"Rotavirus vaccine is an important vaccine for my child"	2/51 = 4%	14/51 = 28%
"I feel confident that rotavirus vaccine works to prevent serious diarrhea"	2/52 = 4%	5/52 = 10%
"I feel confident that rotavirus vaccine is safe"	5/51 = 10%	19/51 = 37%
"If I had another baby, I would have that baby get rotavirus vaccine"	4/52 = 8%	16/52 = 31%

Table 6: Mothers' views on rotavirus vaccine Pre- vs. Post-Intervention from Payne et al. 28 [Intervention: Knowing that DNA fragments from Porcine Circovirus were found in RV1 and RV5 vaccines with no evidence of any harm to humans]

Immunity achieved from acquiring the virus itself	"it's my understanding that I think once you've caught a certain type of norovirus or rotavirus you won't get it again anyway..."
Needing to evaluate research data	"I don't know about getting the other vaccines, there would have to be quite a lot of, [um], literature or research available to me to, to have to make a decision like that..."
A perceived lack of disease threat	"I would definitely not give my son that. Only because I just think diarrhea and stuff is just a natural part I just think it's erm you know natural for everyone to have diarrhea at some point. So I guess, and I really, really hate putting, you know, I hate giving him needles anyway. So I don't think that I would. Unless he was obviously dangerous and then maybe I would, yeah. But not just for diarrhea and vomiting, I don't think."
Vaccination producing a stronger mutated virus	"... something like rotavirus and Norovirus there's always going to be another virus of some sort around the corner, and you vaccinate against one thing and it will develop into something else so no. ((laughs))."
Prevention through holistic approaches	"I wouldn't unless it was life threatening things like meningitis...but something which isn't life threatening as such which I don't believe that norovirus is. So probably no, I probably wouldn't tend to go for something like that all. I'm more keen on trying to manage it holistically or without medication or perhaps other ways."

Table 7: Parental concerns regarding vaccination against viral gastroenteritis (vGE) from Lugg et al. 17

Conclusion

This Systematic Review identified key barriers that are still causing parental rotavirus vaccine hesitancy, despite its many benefits. A key theme identified amongst parental hesitancy was the lack of awareness of the seriousness and burden of viral Gastroenteritis. It was identified that the more serious the disease was perceived, the more receptive parents were towards the vaccine. Additionally, if a medical provider recommended the vaccine, parents were more likely to accept it. Limitations included a narrow number of databases and filtering for English-only articles.

Summary

- Identified key barriers that are still causing parental rotavirus vaccine hesitancy.
- Identifying these barriers enables advancements in parental acceptance of the rotavirus vaccine through:
 - Increasing parental awareness of disease burden
 - Removing rotavirus vaccine age limits
 - Educating parents on vaccine myths

Acknowledgements

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