REVIEW ARTICLE

Awareness of Rotavirus Vaccine among Health Care Providers and Parents/Guardians: A Systematic Review

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Abstract

Background: Diarrhea is a top cause of death in children under five, mainly due to rotavirus. Despite effective vaccines, death rates remain high in developing areas because of low vaccination coverage. This review aims to assess the awareness and knowledge about rotavirus and its vaccine among healthcare workers and parents/guardians.

Methodology: A search was conducted on Scopus, CINAHL, Google Scholar, and PubMed for studies from 2020 to 2024, using keywords related to rotavirus, awareness, and healthcare. The review evaluated the awareness and knowledge of those caring for children under five about the virus and its vaccine, excluding non-English or incomplete studies. Data were organized in Microsoft Excel by author, year, and study design.

Results: Of the 1078 articles, seven met the inclusion criteria. Findings indicate a lack of knowledge about the vaccine among parents/guardians, especially in lower socio-economic areas. At the same time, healthcare providers were more aware of barriers such as cost and availability.

Conclusion: Significant knowledge gaps exist regarding the rotavirus vaccine among parents and healthcare workers. Efforts to educate and train, alongside policy interventions, are critical to increase vaccination rates and reduce rotavirus-related deaths in children.

Keywords

Awareness, Guardian, Healthcare Providers, Rotavirus.

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Introduction

Diarrhea is a significant cause of death among children under the age of five. In 2021, it accounted for approximately 9% of all deaths in this age group worldwide, resulting in over 1,200 deaths per day or around 444,000 deaths per year[1]. Despite the availability of simple and effective treatments such as oral rehydration salts and zinc supplements, the mortality rate remains high, particularly in regions with limited access to healthcare and clean water, such as South Asia and sub-Saharan Africa.

Rotavirus (RV), a leading cause of severe childhood diarrhea, is responsible for about one-third of all diarrhea-related deaths among young children[2]. The WHO has recommended including rotavirus vaccines (RVV) in national immunization programs since 2013 to combat this[3]. These vaccines are also listed on the WHO Model List of Essential Medicines, emphasizing their critical importance for public health and the need to make them widely accessible and affordable to reduce the burden of diarrheal diseases and improve child survival rates globally[4].

Despite the recommendations and evidence on the efficacy of the RVV, vaccination rates remain suboptimal in many areas. For example, in some countries where the vaccine has been included in routine immunization schedules, the vaccination rate against rotavirus is only 25%[5]. This indicates a significant gap between the vaccine's introduction and its acceptance by healthcare providers and parents or guardians. Understanding the reasons for the low uptake rates is crucial for public health efforts to increase vaccine uptake and reduce the incidence of severe rotavirus-induced diarrhea[6]. Healthcare providers must play a significant role in influencing vaccination decisions. Recommendations and education from healthcare providers can positively impact parents' willingness to vaccinate their children[7-9]. Therefore, all healthcare providers need to have a good understanding of RVV. This includes staying updated with the latest research, guidelines, and best practices for vaccinating against rotavirus. Addressing and alleviating parent and caregiver concerns and misconceptions is essential to increase awareness and vaccination rates. Public health campaigns, educational programs, and community outreach efforts can help spread accurate information about the benefits and safety of RVV. These efforts should be culturally sensitive, need-based, and context-appropriate to be effective. As a result, the study will assess the awareness of the rotavirus vaccine among healthcare providers and parents/guardians.

Methodology

This systematic review was conducted from 2020 to 2024 to determine knowledge and awareness of the rotavirus and its vaccine amongst healthcare workers and primary caregivers.

Search Strategy

We searched Scopus, CINAHL, Google Scholar, and PubMed databases within a specific time frame. The search was limited to English language materials. Our search terms included ‘rotavirus,’ 'awareness,’ 'knowledge,’ 'healthcare provider,’ and ‘primary caregiver.’ Additionally, we manually searched for any studies that may have yet to be found in the initial digital search.

Selection of Studies

In order to be included, studies should focus on healthcare providers and primary caregivers of children under 5. These studies must have been published between 2020 and 2024 and should specifically describe the awareness, knowledge, and attitudes toward rotavirus. Criteria for exclusion included non-English publications, articles without full texts available, or those with subpar quality.

Data Extraction

Data was systematically collated using two distinct Microsoft Office Excel sheets: one for healthcare provider information and another for primary caregiver data. This data included author names, publication years, study designs, target age groups, sample sizes, criteria for obesity (if applicable), prevalence rates, and 95% confidence intervals.

Results

The initial search yielded 1,078 articles relevant to the keywords. After eliminating duplicates, 536 articles remained. Further exclusions due to study design and language reduced the pool to 329 articles for screening. Of those, 311 articles matched our criteria after a rigorous appraisal process, and subsequently, 18 articles were subjected to a detailed critical appraisal. Finally, seven articles were selected for inclusion in the review. The progression of study selection is graphically represented in Figure-1, adhering to the PRISMA guidelines[10].

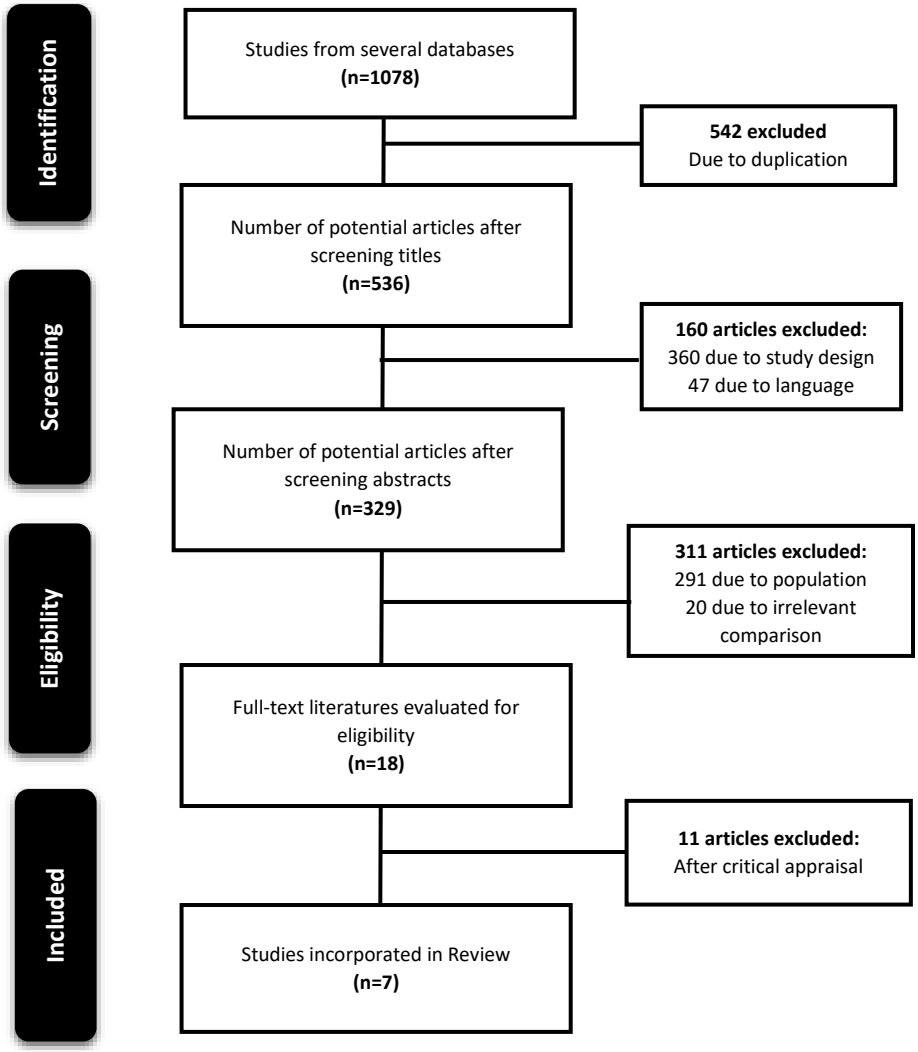

Figure-1 PRISMA Flowchart of Studies Selection

Analysis of Studies Included in the Review

The characteristics of participants across multiple studies investigating the awareness of the rotavirus vaccine among healthcare providers and parents/guardians are summarized in Tables 1 and 2. Each study employed a cross-sectional design with varying age ranges, sample sizes, and occupations in health care, including pediatricians, medical students, midwives, and nurses, focusing on the participants' awareness of the rotavirus vaccine. Data collection procedures included children's medical records, focus group discussions (FGD), in-depth interviews and questionnaires to assess awareness. The findings are summarized in two tables. Table-1 for the parent/ guardian shows a need for more awareness regarding the parent, whereas Table-2 summarizes the studies related to healthcare workers. Key findings highlighted significant awareness of the RV among the participants.

Table-1 Studies Characteristics of Parents/Guardians

Authors, Year	Design	Target Population	Data Collection	Outcome	Findings
Karim et al., 2023[11]	Cross-sectional	Mothers of infants	Mixed-methods in Karachi, Pakistan; data from June 2020 records and FGDs on RVV awareness	Awareness of RVV	Lack of awareness and knowledge on RVV among mothers
Kilicaslan et al., 2022[12]	Cross-sectional	Parents with children under 1 year old	1856 participants; 13-item survey on knowledge and attitudes towards RVV	Awareness of RVV	58.3% knew diarrhea could be fatal; 38.15% knew RV causes diarrhea; 41.59% vaccinated; concerns about side effects and lack of knowledge were noted
Sitaresmi et al., 2021[13]	Cross-sectional	Pregnant women (third trimester) and mothers of babies under 14 weeks old	26 in-depth interviews in rural and urban Yogyakarta, Indonesia	Awareness of RVV	Low knowledge and availability of RVV in Indonesia
Benninghoff et al., 2020[14]	Cross-sectional	Parents/guardians of children under 5 years old (26-35 years)	Online survey in Germany, Poland, Turkey, Indonesia, the Philippines, and Thailand; 1500 participants	Awareness of RVV	High awareness of RV infection (82%); 61% knew RV is the leading cause of gastroenteritis; low awareness of RVGE risk by age 5

Table-2 Studies Characteristics of Healthcare Workers

Authors, Year	Design	Target Population	Data Collection	Outcome	Findings
Sitaresmi et al., 2015[13]	Cross-sectional	Nurses, midwives, primary care providers, and pediatricians (>18 years)	In-depth interviews with healthcare providers in Yogyakarta, Indonesia	Awareness of RVV	Mixed knowledge and attitudes; some unaware of RVV; vaccine cost seen as a barrier
Davis and Francis, 2023[15]	Cross-sectional	Healthcare workers	263 participants; questionnaire assessing knowledge,	Awareness of RVV	47.14% had sufficient knowledge, 66.14% had good attitudes, and 41.1% practiced

			attitude, and practice (KAP) regarding RVV		appropriate protection
Dilen et al., 2022[16]	Cross-sectional	Pediatricians (31.83 ± 6.82 years)	112 participants; 39-question survey on demographics, rotavirus, and RVV	Awareness of RVV	94.6% knew about two types of RVV; 88.4% would vaccinate their children
Zaidi et al., 2021[17]	Cross-sectional	Medical students (18-27 years)	324 students; stratified random sampling; structured questionnaire on knowledge and attitudes	Knowledge and attitude of RVV	87% aware of RVV; mean knowledge score 7.88 ± 2.46; attitude score 4.16 ± 1.23

Risk of Bias in Studies

Low risk of bias was reported in funding and conflict of interest among six studies [11,12,14,15,16,17] except for one study[13] that showed high risk of bias. For outcome assessment, all studies[11-17] showed a low risk of bias. In the domain of exposure assessment, four studies[13-16] showed a low risk of bias, two studies[11,12] showed the unknown risk of bias, and one study[17] showed a high risk of bias (Table-3).

Table-3 Risk of Bias of Included Studies

Author' Year	Funding and Conflict of Interest	Outcome Assessment	Exposure Assessment	Confounding Factors	Attrition Bias	Analysis
Karim et al., 2023[11]	+	+	?	?	-	+
Kilicaslan et al., 2022[12]	+	+	?	?	-	+
Sitaresmi et al., 2021[13]	-	+	+	?	-	+
Benninghoff et al., 2020[14]	+	+	+	?	+	+
Davis and Francis, 2023[15]	+	+	+	?	+	+
Dilen et al., 2022[16]	+	+	+	?	+	+

Zaidi et al., 2021[17]	+	+	-	?	+	+

+ Low Risk of Bias
- indicates High Risk of Bias
? Unknown Risk of Bias

Discussion

The studies reviewed provide a comprehensive view of the awareness and perceptions of both parents/guardians and healthcare workers regarding the RVV. The general trend observed is a significant gap in awareness and knowledge among parents, while healthcare workers show relatively better understanding but still face barriers regarding RVV administration.

The findings across multiple countries indicate varying awareness and knowledge about rotavirus and its vaccine among parents and guardians. For instance, Karim et al.[11] highlighted a profound need for more awareness among mothers in Karachi, Pakistan, about RVV's role in preventing diarrhoea. This was echoed by Kilicaslan et al.[12] who found that although most parents knew diarrhoea could be fatal, less than half associated it with rotavirus and even fewer had vaccinated their children against it. The primary reasons for non-vaccination included lack of knowledge and fear of side effects. Similarly, Sitaresmi et al.[13] found low RVV knowledge and availability levels in Indonesia, suggesting geographical and possibly socio-economic disparities in vaccine information dissemination. On a broader scale, Benninghoff et al.[14] reported high awareness of rotavirus in countries like Germany, Poland, and Turkey. However, many parents were unaware that rotavirus was the leading cause of gastroenteritis in children under five.

Healthcare workers generally exhibited a higher awareness of RVV than parents. Davis and Francis[15] reported that nearly half of the healthcare workers had sufficient knowledge about rotavirus protection, with a majority demonstrating positive attitudes towards the vaccine. However, there was a gap in the actual vaccine administration. Dilen et al.[16] observed that almost all pediatricians surveyed were aware of the different types of rotavirus vaccines and supported vaccinating children. Despite this, Sitaresmi et al.[13] noted that in Indonesia, mixed feelings about the necessity of the vaccine persisted among healthcare providers, influenced by its availability and cost on the private market. The studies highlight several barriers to RVV uptake. Among parents, the predominant barriers were lack of knowledge and fear of side effects. Although knowledge was generally higher for healthcare workers, issues such as vaccine cost and availability, particularly in lower-income countries, presented significant obstacles.

Additionally, the perception of vaccine necessity varied, indicating a need for more consistent and widespread education on the importance of RVV. The discrepancies in awareness and attitudes towards RVV between parents and healthcare workers underscore the need for targeted educational interventions. Enhancing awareness through public health campaigns, particularly in regions with low RVV uptake, could address parental concerns and misinformation.

For healthcare workers, continued professional development and addressing logistical barriers such as vaccine cost and supply are crucial. More studies are needed to explore the socio-economic factors influencing RVV uptake and to develop tailored interventions to overcome identified barriers.

Conclusion

The systematic review highlights significant gaps in awareness and knowledge about the RVV among parents and healthcare workers. Addressing these gaps through targeted education, improved healthcare worker training and policy interventions can enhance RVV uptake and reduce the incidence of rotavirus-related gastroenteritis in children.

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None.

Conflict of Interest

None.

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AUTHORS' CONTRIBUTION

The following authors have made substantial contributions to the manuscript as under:

Conception or Design: Chandio AS, Rind NA

Acquisition, Analysis or Interpretation of Data: Chandio AS, Khuwaja I, Latif A

Manuscript Writing & Approval: Chandio AS, Rind NA

All the authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.