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School-Based Deworming Medication Utilization among School-Going Children in Rural Rwanda: Caregivers' Perceptions and Experiences: A Qualitative Study

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Abstract: ***Background:*** **School-based deworming has become a cornerstone of Rwanda's strategy against soil-transmitted helminth infections, yet measurable program coverage does not always translate into actual medication ingestion by children. Caregivers are central to this gap, since their understanding, beliefs, and day-to-day decisions ultimately determine whether a child swallows the tablet offered at school. This study explored caregivers' perceptions and lived experiences of deworming medication utilization among school-going children in Rusizi District, Rwanda.** ***Methods:*** **A descriptive qualitative design was used. Thirty caregivers of school-going children aged 7 to 18 years were purposively selected from communities in Rusizi District where school-based deworming campaigns had recently taken place. Data were collected through semi-structured, in-depth interviews and key informant interviews with teachers and community health workers, conducted in Kinyarwanda, audio-recorded with consent, and later transcribed and translated into English. Data collection continued until no new ideas emerged from successive interviews. Transcripts were analyzed using reflexive thematic analysis.** ***Results:*** **Six interconnected themes were identified: knowledge and awareness of deworming, perceived benefits of deworming, fear of side effects and misconceptions, trust in schools and community health workers, school attendance and access challenges, and the influence of previous experiences on future participation. Caregivers generally regarded deworming as beneficial for their children's appetite, growth, and classroom concentration, and placed considerable trust in schools and health workers as program implementers. At the same time, fear of side effects, lingering misconceptions about repeated dosing, and absenteeism on campaign days were recurring obstacles shaping whether children ultimately received and swallowed the medication.** ***Conclusion:*** **Caregivers' decisions about deworming participation are shaped by an interplay of knowledge, trust, fear, and prior experience rather than by any single factor in isolation. Strengthening pre-campaign communication, openly addressing side-effect concerns, and building structured catch-up mechanisms for absent children would help translate caregivers' generally favorable attitudes into more complete and consistent utilization.**

Keywords: **deworming; caregivers; qualitative study; school-going children; soil-transmitted helminths; Rwanda; thematic analysis.**

I. INTRODUCTION

Global Burden of Soil-Transmitted Helminth Infections

Soil-transmitted helminth (STH) infections continue to affect an estimated 1.5 billion people worldwide, with the heaviest burden falling on low- and middle-income countries where sanitation infrastructure remains limited and contact with contaminated soil is part of everyday life [1]. School-aged children are disproportionately affected: their play habits, inconsistent handwashing, and close physical contact in classrooms create conditions favorable for transmission of Ascaris

lumbricoides, Trichuris trichiura, and hookworm species. Left untreated, these infections quietly erode a child's nutritional status, contribute to anemia, and have been linked to stunted growth and diminished cognitive development, with knock-on effects for school attendance and academic achievement [1, 2]. Sub-Saharan Africa alone accounts for nearly 29% of the global STH burden, and although prevalence among children fell from roughly 35% to 11% between 2000 and 2018, the absolute number of affected children remains substantial and unevenly distributed across the region [3].

School-Based Deworming as a Public Health Strategy

Recognizing the scale of this burden, the World Health Organization has long recommended periodic preventive chemotherapy for children living in endemic areas, typically delivered through school-based platforms because of their wide reach and built-in organizational structure [1]. Schools offer a practical advantage that few other delivery channels can match: children are already gathered in one place, teachers are trusted by families, and government health programs can coordinate logistics with relative ease. Rwanda has embraced this model, embedding deworming within its National Neglected Tropical Disease Strategic Plan since 2019 and conducting regular mass drug administration campaigns across all districts [5]. National estimates place STH prevalence at around 41% of the general population, and successive rounds of preventive chemotherapy have been rolled out with the explicit aim of reducing this burden among children [6].

Why Caregivers Matter

Despite the apparent simplicity of school-based delivery, a tablet handed to a child does not automatically become a tablet swallowed. Caregivers play a quietly decisive role in this process: they decide whether a child attends school on the campaign day, they shape how a child interprets and responds to the medication, and they are often the first to hear about, and react to, stories of side effects circulating within the community. A multi-site evaluation under the DeWorm3 project found that school-level reporting of deworming coverage routinely overstates true individual-level ingestion, precisely because such reporting captures distribution rather than confirmed swallowing [8]. This distinction matters enormously for program evaluation, and it points directly back to the household, where caregivers' beliefs, fears, and trust ultimately determine whether the gap between distribution and ingestion is wide or narrow.

What Existing Evidence Shows

A growing qualitative and mixed-methods literature has begun to document how caregiver perceptions shape deworming participation across sub-Saharan Africa. Work examining the social and behavioral drivers of mass drug administration has found that community trust in local health workers and teachers significantly increases acceptance of preventive treatment programs, and that this trust is often what converts a distribution effort into actual medication uptake [4]. In Ghana, caregivers' descriptions of mild but visible adverse reactions, including dizziness, vomiting, and abdominal discomfort, have been shown to generate hesitation that persists across multiple campaign rounds even when the reactions themselves are transient and clinically minor [16]. Stakeholder research in rural Rwanda has likewise documented a recurring belief among some caregivers that a child who appears healthy does not need deworming, alongside concerns that repeated tablets might cause excessive appetite or other unwanted effects [9]. Teachers, too, have been identified as central figures in this picture: in Tamil Nadu, India, teachers with stronger knowledge of STH transmission were found to communicate program rationale more effectively and to build greater parental confidence in the intervention [13].

The Rwandan Research Gap

Even with this expanding evidence base, very little of it speaks directly to the rural Rwandan context at district level. Most Rwandan research on deworming has concentrated on parasitological outcomes, prevalence, intensity, and drug efficacy, leaving the experiential dimension of caregiver decision-making comparatively underexplored [6, 7]. Rusizi District, situated along Rwanda's western border with the Democratic Republic of Congo and Burundi, combines subsistence agriculture, mixed educational attainment, and cross-border population movement in ways that may shape caregiver attitudes differently than in other parts of the country. Without a grounded understanding of how caregivers in this specific setting think and talk about deworming, program planners are left guessing at the reasons behind any residual gap between distribution and confirmed ingestion.

Study Objective

This study set out to explore, in caregivers' own words, their perceptions, beliefs, and lived experiences of school-based deworming medication utilization among school-going children in Rusizi District, Rwanda. Rather than measuring prevalence or testing statistical associations, the aim here was to understand the reasoning, emotions, and social context that shape whether a caregiver ultimately allows, and ensures, their child's participation in the program.

II. MATERIALS AND METHODS

A. Study Design

This study used a descriptive qualitative design, an approach well suited to capturing participants' perspectives and experiences in their own language without imposing a heavy theoretical framework on the data [10]. The design was chosen because the research question centered on understanding how caregivers make sense of deworming, rather than on testing a predefined hypothesis.

B. Study Setting

The study was conducted in Rusizi District, located in Rwanda's Western Province along the country's border with the Democratic Republic of Congo and Burundi. The district has an estimated population of 485,529 (Rwanda Population and Housing Census, 2022) and is predominantly rural, with subsistence farming as the dominant livelihood. School-based deworming campaigns are conducted periodically across primary schools in the district as part of the national NTD strategy.

C. Study Population

The study population comprised parents and legal guardians of school-going children aged 7 to 18 years enrolled in primary schools where a deworming campaign had recently taken place, together with teachers and community health workers who had direct involvement in implementing the campaigns and could offer an informed outsider perspective on caregiver behavior.

D. Sampling Strategy

Participants were selected using purposive sampling, chosen specifically because the study sought information-rich cases capable of illuminating the research question in depth rather than a statistically representative sample [10]. Sampling deliberately sought variation across sex, educational attainment, and whether the caregiver's child had or had not utilized the deworming medication during the most recent campaign, in order to capture a broad range of perspectives. A total of 30 caregivers were interviewed. Recruitment continued until successive interviews stopped generating substantially new ideas, at which point the research team judged that an adequate depth of understanding had been reached for the study's scope.

E. Participant Recruitment

Participants were identified with the support of school authorities and community health workers, who were familiar with households in their catchment areas and helped the research team locate caregivers meeting the eligibility criteria. Potential participants were approached in person, informed of the study's purpose, and invited to take part voluntarily. Those who agreed were scheduled for an interview at a time and location convenient to them, typically within or near the school compound or in a quiet space within the community.

F. Interview Guide

Data collection was guided by a semi-structured interview protocol developed from the study's objectives, incorporating open-ended questions designed to encourage caregivers to speak freely about their understanding of deworming, their experiences with the most recent campaign, and the factors that influenced whether their child participated. A parallel key informant interview guide was used with teachers and community health workers, focusing on their role in mobilization, communication, and observed caregiver behavior. Both guides were piloted with a small number of participants outside the main sample, and probing questions were refined to elicit richer, more detailed responses before the main data collection began.

G. Data Collection

Interviews were conducted in Kinyarwanda by trained researchers familiar with the local context, using open-ended questions and follow-up probes to draw out detailed accounts. With participants' consent, interviews were audio-recorded, and handwritten field notes were taken to capture non-verbal observations and contextual detail. Each interview lasted approximately 30 to 45 minutes. Interviews were held in private, respectful settings to encourage candid responses and were conducted until the research team observed that no meaningfully new themes were emerging from additional conversations.

H. Data Analysis

Audio recordings were transcribed verbatim and translated into English by the principal investigator, with translations checked for accuracy by a bilingual expert not otherwise involved in the study. Reflexive thematic analysis was used to analyze the data, following an iterative process of repeated reading for familiarization, generation of initial codes, searching for patterns across codes, and refining these into coherent themes and sub-themes that captured the substance of participants' accounts. This process was conducted manually and cross-checked among the research team to guard against any single researcher's assumptions unduly shaping the findings.

I. Trustworthiness

Trustworthiness was addressed using the four criteria proposed by Lincoln and Guba: credibility, dependability, confirmability, and transferability. Credibility was strengthened through in-depth interviewing and probing techniques that allowed participants to articulate their views fully, and through the consistent use of direct quotations to anchor interpretations in participants' own words. Dependability was supported by applying a uniform, pre-tested interview guide across all sessions. Confirmability was pursued by grounding every theme in verifiable excerpts from the transcripts rather than in the researchers' prior assumptions. Transferability was supported by describing the study context and participant characteristics in sufficient detail for readers to judge the relevance of the findings to comparable settings.

J. Ethical Approval

Ethical clearance was obtained from the Mount Kigali University Institutional Review Board prior to data collection, and administrative authorization was secured from Rusizi District health and education authorities. All participants gave written informed consent after the purpose, procedures, and voluntary nature of the study were explained in Kinyarwanda. Participants were assured that they could withdraw at any point without consequence, and confidentiality was maintained throughout by replacing names with numeric codes in transcripts and reporting. The study adhered to the ethical principles outlined in the Declaration of Helsinki.

III. RESULTS

Thirty caregivers participated in this study, the majority of whom (66.7%) were women, reflecting the predominant role mothers play in managing children's health within these households. Most participants were aged between 35 and 44 years (40.0%), and educational attainment ranged from no formal schooling (16.7%) to higher education (13.3%), with primary schooling being the most common level attained (40.0%). Six interconnected themes emerged from the analysis, summarized below and presented in full, with representative quotations, in Table I.

Theme 1. Knowledge and Awareness of Deworming

Caregivers generally demonstrated a working understanding of what deworming involves and why schools organize it, though the depth of that understanding varied considerably from one participant to another. Most described it in straightforward terms: a school-led activity intended to rid children of intestinal worms picked up through everyday contact with contaminated soil and water. Several caregivers credited the school itself as their primary source of information, recalling that notices were sent home through their children or announced during parent meetings ahead of the campaign.

"Before the activity, the school sent information through the children and even during meetings. That is how I knew there was a deworming campaign, so I allowed my child to participate without hesitation." (Mother, 34 years)

Some caregivers articulated a more biologically grounded understanding, linking the medication directly to the consequences of untreated worm infections.

"From what I understand, these tablets help to remove worms that children get from dirty environments. When a child has worms, they don't grow well or eat properly, so this medicine is important." (Father, 41 years)

Not every participant shared this clarity, however. A subset of caregivers expressed genuine uncertainty about why deworming needed to be repeated year after year, particularly for children who showed no outward signs of illness, suggesting a gap between the biomedical logic of preventive treatment and caregivers' everyday reasoning about visible health.

"To be honest, I don't fully understand why they give these tablets every year. Sometimes I feel like children who are not sick may not need them." (Mother, 29 years)

This uncertainty did not necessarily translate into outright refusal, but it did appear to soften some caregivers' sense of urgency about ensuring their child's attendance on campaign days.

Theme 2. Perceived Benefits of Deworming

Despite gaps in technical understanding, caregivers were largely consistent in describing tangible, observed benefits of deworming, and these perceived benefits appeared to anchor much of the program's ongoing community support. Caregivers frequently described noticeable changes in their children's appetite and energy levels following treatment.

"After my child takes the deworming medicine, I see a difference. He becomes more active, eats better, and does not complain of stomach pain like before." (Mother, 37 years)

Others framed the benefit in preventive terms, connecting deworming to the avoidance of more serious downstream consequences such as anemia or general weakness.

"Deworming helps prevent diseases caused by worms. If children are not treated, they can become weak or anaemic, so it is better to prevent early." (Father, 45 years)

A number of participants, including one who was also a schoolteacher, extended this reasoning into the classroom, suggesting that healthier children were better able to concentrate and perform academically.

"Children who take these medicines are more attentive in class. When they are healthy, they concentrate better and perform well in school." (Teacher/Parent, 39 years)

These accounts of visible, personally observed benefit appeared to function as a kind of informal evidence base for caregivers, reinforcing their willingness to support the program even where their technical understanding of helminth transmission remained incomplete.

Theme 3. Fear of Side Effects and Misconceptions

Set against this generally favorable view, fear of adverse reactions emerged as the most consistently repeated source of hesitation across the interviews. Several caregivers described having witnessed, or heard about, children experiencing dizziness or vomiting after taking the tablets, and these observations appeared to travel quickly through informal community networks.

"I have seen some children feeling dizzy or even vomiting after taking the tablets. Because of that, I was worried that my child might experience the same problem." (Mother, 32 years)

Closely related to this fear were broader misconceptions about the medication's strength and safety, often circulating as community rumor rather than grounded in any direct experience.

"Some people in the community say that these medicines are very strong and can harm young children, so sometimes it creates fear among parents." (Father, 44 years)

Practical barriers compounded these perception-based concerns. Several caregivers recounted instances where their child had been too unwell to attend school on the specific campaign day, meaning the opportunity to receive the medication was simply missed rather than deliberately declined.

"On the day they gave the medicine, my child was not at school because he was sick. So, he missed the opportunity to take it." (Mother, 36 years)

Taken together, these accounts suggest that resistance to deworming was rarely categorical. More often, caregivers described a kind of conditional caution: a willingness to participate tempered by specific, addressable concerns about safety and circumstance.

Theme 4. Trust in Schools and Community Health Workers

Schools were described almost universally as a trusted and well-organized point of delivery, and this institutional trust appeared to do considerable work in offsetting caregivers' side-effect concerns. Caregivers repeatedly praised the orderliness of school-based administration, noting that teachers actively supervised the process.

"The school organizes everything very well. Children are gathered, given the medicine, and monitored by teachers, which makes it easy for parents." (Mother, 40 years)

Beyond logistics, teachers were also credited with playing an explanatory and reassuring role, helping caregivers understand the purpose of the campaign in advance.

"Teachers explain to us before the program and even reassure the children. That communication helps us understand why the medicine is important." (Father, 38 years)

Community health workers (CHWs) were identified as an equally important, if less visible, layer of mobilization, particularly for reaching caregivers who might not otherwise attend school meetings or receive written notices.

"Community health workers also move around the village informing us about the campaign. Their involvement encourages many parents to participate." (Mother, 35 years)

This theme illustrates that institutional trust was not simply assumed; it was actively built through visible supervision, direct explanation, and household-level outreach, mechanisms that appeared to matter as much as the medication itself in shaping caregiver willingness.

Theme 5. School Attendance and Access Challenges

Because the deworming program operates exclusively through schools, physical presence on the campaign day functioned as an absolute precondition for participation, and several caregivers' accounts made this structural dependency explicit. Illness was the most frequently cited reason for a child's absence, but caregivers also alluded to other logistical obstacles, including domestic responsibilities and, in some households, simple lack of advance notice about the exact date.

Caregivers whose children had missed a campaign tended to describe the experience as an unfortunate coincidence of timing rather than a deliberate choice, distinguishing this barrier clearly from the perception-based hesitation discussed in Theme 3.

"On the day they gave the medicine, my child was not at school, so he missed the opportunity." (Mother, 36 years)

Several teachers and community health workers interviewed as key informants confirmed this pattern from the implementation side, observing that children absent on campaign day were rarely, if ever, offered a later opportunity to receive the tablet, leaving a structural gap in coverage that had little to do with caregiver attitudes and everything to do with the absence of a catch-up mechanism.

Theme 6. Previous Experiences Shape Future Participation

Caregivers' accounts of past deworming campaigns, whether reassuring or troubling, appeared to carry forward into how they approached the present one, functioning as a kind of accumulated personal evidence base. Caregivers who recalled smooth, uneventful experiences in previous rounds tended to express continued, almost automatic, support for the program.

"My children have taken deworming medicine many times, and I have never seen any serious problem. That is why I continue to support it." (Mother, 46 years)

Conversely, caregivers who recalled a child experiencing discomfort after a previous dose carried that memory into subsequent decisions, often describing a need for additional reassurance before agreeing again.

"The last time my child took the medicine, he complained of stomach pain and felt weak. That experience made me worried." (Mother, 31 years)

"Because of what happened before, I was not comfortable this time. I needed more reassurance before allowing my child again." (Father, 43 years)

This theme underscores that caregiver trust is not static; it is continually renegotiated with each campaign cycle based on the most recent remembered outcome, which has direct implications for how implementers might sustain confidence over successive rounds of treatment.

Integrative Summary

Read together, these six themes describe a layered decision-making process rather than a single determining factor. Knowledge sets the foundation for whether deworming makes sense to a caregiver at all; perceived benefits and institutional trust build a reservoir of goodwill toward the program; fear of side effects and structural access barriers act as countervailing forces that can erode participation even where goodwill exists; and previous experience continually recalibrates how much reassurance a caregiver needs before the cycle repeats. This interplay is illustrated in Fig. 1, which maps how the six themes relate to one another in shaping the ultimate decision to participate.

TABLE I. THEMES, SUB-THEMES, AND REPRESENTATIVE QUOTATIONS ON CAREGIVERS' PERCEPTIONS OF DEWORMING MEDICATION UTILIZATION

Theme	Sub-theme	Representative Quotation
Knowledge and Awareness of Deworming	Awareness of deworming programs	*"Before the activity, the school sent information through the children and even during meetings. That is how I knew there was a deworming campaign, so I allowed my child to participate without hesitation." (Mother, 34)*
	Understanding of purpose	*"From what I understand, these tablets help to remove worms that children get from dirty environments. When a child has worms, they don't grow well or eat properly." (Father, 41)*
	Limited knowledge and misconceptions	*"To be honest, I don't fully understand why they give these tablets every year. Sometimes I feel like children who are not sick may not need them." (Mother, 29)*
Perceived Benefits of Deworming	Improved child health	*"After my child takes the deworming medicine, I see a difference. He becomes more active, eats better, and does not complain of stomach pain like before." (Mother, 37)*
	Prevention of disease	*"Deworming helps prevent diseases caused by worms. If children are not treated, they can become weak or anaemic, so it is better to prevent early." (Father, 45)*
	Improved school performance	*"Children who take these medicines are more attentive in class. When they are healthy, they concentrate better and perform well in school." (Teacher/Parent, 39)*
Fear of Side Effects and Misconceptions	Fear of adverse reactions	*"I have seen some children feeling dizzy or even vomiting after taking the tablets. Because of that, I was worried that my child might experience the same problem." (Mother, 32)*
	Community misconceptions about safety	*"Some people in the community say that these medicines are very strong and can harm young children, so sometimes it creates fear among parents." (Father, 44)*
Trust in Schools and Community Health Workers	School as a trusted delivery platform	*"The school organizes everything very well. Children are gathered, given the medicine, and monitored by teachers, which makes it easy for parents." (Mother, 40)*
	Role of community health workers	*"Community health workers also move around the village informing us about the campaign. Their involvement encourages many parents to participate." (Mother, 35)*
School Attendance and Access Challenges	Absenteeism on campaign day	*"On the day they gave the medicine, my child was not at school because he was sick. So, he missed the opportunity to take it." (Mother, 36)*
	Hesitation despite reassurance	*"Even though they tell us it is safe, sometimes I still feel unsure. I always think about possible side effects before allowing my child to take it." (Mother, 30)*
Previous Experiences Shape Future Participation	Positive past experience	*"My children have taken deworming medicine many times, and I have never seen any serious problem. That is why I continue to support it." (Mother, 46)*
	Negative past experience	*"The last time my child took the medicine, he complained of stomach pain and felt weak. That experience made me worried." (Mother, 31)*

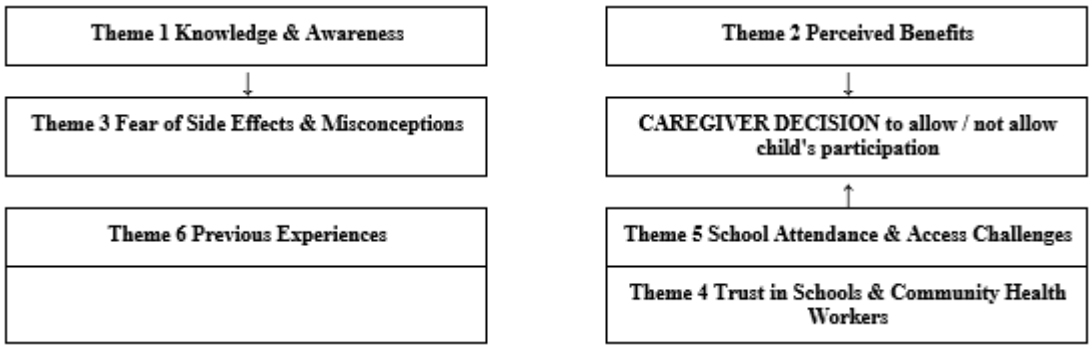


Fig. 1. Conceptual framework illustrating the relationship between the six themes and caregivers' decisions on deworming medication utilization among school-going children in Rusizi District, Rwanda.

IV. DISCUSSION

This study explored caregivers' perceptions and lived experiences of school-based deworming medication utilization in Rusizi District, Rwanda, and identified six themes that together describe a layered, dynamic decision-making process. Several of these findings closely echo evidence from other East African settings, while others highlight features that appear more specific to the Rwandan context.

Knowledge, Awareness, and the Persistence of Misconceptions

The coexistence of reasonably good general awareness alongside specific misconceptions about repeated dosing closely mirrors findings from rural Rwanda itself, where stakeholder research has documented caregivers questioning the need to deworm children who appear visibly healthy, alongside concerns that medication might cause excessive appetite or other unwanted effects [9]. A similar pattern of partial understanding has been observed in Ethiopia, where caregiver and household knowledge gaps were found to meaningfully shape deworming uptake even in communities with generally positive attitudes toward the intervention [14]. These parallels suggest that the gap between biomedical preventive logic and everyday caregiver reasoning is not unique to Rusizi District; it appears to be a recurring feature of how communities across the region make sense of treating children who show no outward symptoms of illness.

Perceived Benefits as a Foundation for Program Support

Caregivers' emphasis on observable improvements in appetite, energy, and school concentration aligns closely with stakeholder perspectives documented elsewhere in rural Rwanda, where community members likewise expressed broad support for the deworming program grounded in perceived practical benefit [9]. Comparable findings have emerged from Ghana, where community perspectives on mass drug administration were found to be shaped substantially by local knowledge and the visible benefits caregivers associated with treatment, rather than by abstract trust in the health system alone [17]. This consistency across settings suggests that perceived, personally observed benefit functions as a particularly powerful form of informal evidence for caregivers, arguably more persuasive in shaping behavior than formal health messaging on its own.

Fear of Side Effects: A Recurring Regional Challenge

The prominence of side-effect fear identified in this study is strongly consistent with evidence from Ghana, where documented post-deworming reactions including dizziness, weakness, vomiting, and abdominal pain were found to dampen subsequent medication consumption unless accompanied by clear caregiver education [16]. The Rusizi caregivers' tendency to link specific, witnessed incidents of dizziness or vomiting to their own hesitation reflects the same underlying mechanism: isolated, even minor, adverse events can disproportionately shape community perception when they are not accompanied by clear explanation. This pattern reinforces the conclusion that the issue is rarely the medication's actual safety profile, which remains well established, but rather the absence of proactive, honest communication about what mild and temporary reactions might look like and why they occur.

Trust in Schools and Community Health Workers as a Counterbalancing Force

The centrality of schools and teachers as trusted implementers in this study is consistent with research from Tamil Nadu, India, where teachers with adequate knowledge of soil-transmitted helminth transmission were found to serve as effective informal health educators, building parental confidence in the program well beyond their formal role as medication administrators [13]. The complementary role attributed to community health workers in this study also aligns with broader

WHO guidance emphasizing that deworming functions most effectively when integrated with health education delivered through trusted local channels rather than treated as a standalone pharmaceutical intervention [1]. Comparable evidence from Kigali's Masaka sector similarly found that awareness of intestinal parasite-related symptoms could be reasonably high even where specific knowledge gaps persisted, reinforcing the conclusion that trusted local intermediaries remain essential even in communities that are not entirely uninformed [18].

Structural Access Barriers and the Absence of Catch-Up Mechanisms

The clear distinction caregivers drew between deliberate hesitation and simple absenteeism reflects a structural reality long recognized in school-based deworming programs across the region. Kenya's national deworming program, one of the largest and longest-running in East Africa, has documented campaign-day school attendance as the primary child-level determinant of coverage across successive treatment rounds, underscoring how heavily school-based delivery models depend on physical presence rather than caregiver willingness alone [12]. The Rusizi findings extend this observation by illustrating, through caregivers' own accounts, that absenteeism is frequently involuntary, driven by illness or logistical circumstance rather than parental reluctance, which strengthens the case for structured catch-up mechanisms as a programmatically straightforward way to close residual coverage gaps.

The Role of Cumulative Experience

The finding that prior experience, whether reassuring or troubling, shapes future participation decisions is broadly consistent with patterns observed in Uganda and Tanzania, where community acceptance of mass drug administration programs has been shown to build cumulatively across treatment rounds, with early positive experiences often determining the trajectory of long-term program trust [4]. This suggests that the first few campaigns a community experiences may carry outsized influence on participation patterns for years afterward, making early, careful management of side effects and communication particularly consequential for program sustainability.

Cross-Regional Synthesis

Taken as a whole, these comparisons suggest that caregiver decision-making around deworming in Rusizi District is shaped by forces that recur across Rwanda, Kenya, Ethiopia, Uganda, and Tanzania alike: the tension between biomedical preventive logic and everyday caregiver reasoning, the disproportionate influence of visible side effects on community perception, the stabilizing role of trusted local implementers, and the structural dependency of school-based programs on attendance. What distinguishes Rusizi is less the presence of these forces than their particular configuration, a setting where institutional trust in schools appears unusually strong, yet where specific misconceptions about repeated dosing and absenteeism-driven access gaps remain meaningful, addressable barriers to fuller participation.

V. STRENGTHS AND LIMITATIONS

This study offers a grounded, district-specific qualitative account of caregiver perspectives in a part of Rwanda that remains underrepresented in the published deworming literature, providing texture and explanation that quantitative coverage statistics alone cannot supply. The use of purposive sampling to capture variation in sex, education, and utilization status strengthened the diversity of perspectives represented, and the consistent grounding of every theme in direct participant quotations supports the credibility of the findings.

At the same time, several limitations should be acknowledged. As with all qualitative research, the findings are not intended to be statistically generalizable beyond the specific communities studied, and caregiver accounts may have been subject to social desirability bias, particularly regarding sensitive topics such as medication hesitancy. Recall of past deworming experiences may also have been imperfect, given that some events described occurred during earlier campaign cycles. Finally, the study captured caregiver perspectives only for school-enrolled children; the experiences of caregivers whose children are not enrolled in school, who may face a different and potentially more pronounced set of access barriers, fall outside the scope of this analysis.

VI. CONCLUSION

Caregivers in Rusizi District generally view school-based deworming as a beneficial and well-organized intervention, and much of this confidence rests on visible improvements they have personally observed in their children alongside strong trust in schools and community health workers as implementers. Yet this favorable disposition coexists with persistent misconceptions about the necessity of repeated dosing, recurring fear of side effects rooted in community narratives rather than direct medical evidence, and a structural dependency on school attendance that leaves absent children with no clear

path to catch up. These six themes, taken together, suggest that improving utilization further will depend less on convincing skeptical caregivers and more on reinforcing existing trust, addressing specific and articulable fears with honest communication, and closing a logistical gap that has little to do with attitudes at all. Programmatic attention to these three areas, communication, reassurance, and structured catch-up delivery, would likely move an already well-regarded program closer to universal participation.

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Conflict of Interest

The authors declare no conflict of interest related to this study.

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