

Facilitators and Barriers to Retinopathy of Prematurity Screening in a Tertiary Care Facility: A Mixed-Methods Study

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Abstract

Background

Retinopathy of prematurity (ROP) is a preventable cause of childhood blindness, but screening coverage and adherence to recommended schedules remain inconsistent in many resource-constrained neonatal services. This study quantified ROP screening uptake and timing and explored the health-system, provider and caregiver factors influencing screening at a tertiary hospital in south-western Nigeria.

Methods

This convergent parallel mixed-methods study combined a retrospective review of quantitative data from May 2016 to May 2020 with prospective key-informant interviews conducted from 3 to 8 April 2026 at University College Hospital, Ibadan. The quantitative component included all eligible infant records and described neonatal characteristics, screening uptake and timing using SPSS version 23. Twelve healthcare professionals involved in neonatal care or ROP screening participated in interviews. Transcripts were analysed thematically in QDA Miner Lite using an inductive-deductive approach informed by the Consolidated Framework for Implementation Research. The two datasets were analysed separately and integrated during interpretation and reporting.

Results

Among 531 eligible preterm infants, 180 (33.9%) underwent ROP screening. Of those screened, 12.8% were examined beyond the recommended period; the mean postmenstrual age at screening was 39.5 ± 7.0 weeks and the median postnatal age was 7.0 weeks (IQR 5.0–10.0). Five integrated themes explained programme performance: effective screening and eligibility decisions; workforce, equipment and coordination constraints; caregiver awareness and post-discharge follow-up; professional commitment and interdepartmental collaboration; and priorities for a sustainable programme. Staffing shortages, absence of a dedicated coordinator, limited equipment, early discharge and missed follow-up appointments weakened the screening pathway, whereas team commitment, collaboration, existing protocols and external technical support partially sustained the service.

Conclusions

ROP screening coverage was low and examinations were frequently delayed. Improving performance requires institutional ownership, a named programme coordinator, adequate workforce and equipment, clear eligibility processes, structured tracking and recall systems, and repeated caregiver counselling embedded within routine neonatal care.

Background

Retinopathy of prematurity (ROP) is a vasoproliferative retinal disorder that affects preterm and low-birth-weight infants and can progress to retinal detachment, severe visual impairment and irreversible blindness when screening and treatment are delayed. Globally, ROP is an important cause of potentially avoidable childhood blindness, and the burden is increasingly concentrated in low- and middle-income countries where survival of preterm infants has improved more rapidly than the capacity to provide consistently high-quality neonatal care, screening and treatment [1, 2].

Africa has been described as a new frontier for ROP because expanding neonatal services have increased the survival of at-risk infants, including infants who are larger and more mature than those typically affected in well-resourced settings [2]. The risk profile reflects variable oxygen monitoring, infection control, staffing, equipment and follow-up systems. Consequently, screening criteria and service-delivery models must be adapted to local neonatal populations and health-system capacity rather than transferred uncritically from high-income settings [2, 3].

Nigeria has made important progress in strengthening ROP services through advocacy, multidisciplinary collaboration, capacity building and the development of a national screening protocol [3]. Nevertheless, screening remains unavailable or inconsistently delivered in many neonatal units. A national survey found that functional screening teams and access to oxygen-monitoring equipment were limited, while a Nigerian case series showed that most children who developed ROP blindness had never been screened [4, 5]. These observations indicate that the existence of screening guidance alone does not guarantee timely identification, examination, follow-up and treatment of eligible infants.

ROP screening is a multistep care pathway. Eligible infants must be identified, caregivers counselled, examinations scheduled, the infant kept within or returned to the health system at the appropriate time [6], the examination completed by trained personnel [7] using functional equipment [8], and subsequent follow-up or treatment reliably arranged. Failure at any point can lead to a missed or delayed examination. Quantitative measures such as screening coverage and timeliness show the magnitude of the gap, whereas qualitative accounts from frontline staff help explain why the gap persists. Presenting these data separately can obscure how programme outcomes arise from interactions among patients, caregivers, professionals, institutional structures and the wider health system.

The Consolidated Framework for Implementation Research (CFIR) provides a structured approach for examining these interactions across the innovation, inner setting, outer setting, individuals and implementation-process domains [9]. International screening guidance emphasises timely initial and follow-up examinations for at-risk preterm infants [10]. Guided by CFIR, this mixed-methods study assessed ROP screening uptake and timing among eligible infants and explored the barriers and facilitators experienced by healthcare professionals at a tertiary facility in Ibadan. The study specifically sought to integrate quantitative programme indicators with qualitative explanations so that the findings could inform feasible, context-sensitive improvements in ROP screening.

Methods

This study employed a convergent parallel mixed-methods design, combining a retrospective review of quantitative data with a prospective cross-sectional qualitative component. The two datasets were analysed separately and integrated during interpretation. The retrospective quantitative data covered the period from May 2016 to May 2020, while the qualitative data were collected prospectively from 3 to 8 April 2026 at University College Hospital, Ibadan, a tertiary referral hospital in south-western Nigeria.

The hospital provides level III neonatal care and specialist ophthalmology services. ROP examinations were performed by ophthalmologists either in the neonatal unit or at the ophthalmology outpatient clinic, using the programme's standard screening procedures. The quantitative component included records of infants admitted to the newborn units who met the study's ROP screening criteria. Eligible infants were those born at a gestational age of less than 34 weeks or with a birth weight below 1,500 g. Infants with additional clinical risk factors, including oxygen exposure, severe illness or postnatal growth restriction, were also considered eligible. Infants who died before reaching the scheduled screening age or were transferred or relocated before screening could be completed were excluded.

A census of all eligible records identified during the quantitative study period was undertaken; therefore, no a priori sample-size calculation was required. Data were extracted using a structured form and included maternal and neonatal characteristics, gestational age, birth weight, mode of delivery, relevant clinical exposures, screening status, age at first screening, ophthalmic findings and follow-up outcomes.

For the qualitative component, an interview guide was developed specifically for this study and had not been previously published. An English-language version of the interview guide is provided as Supplementary Document S1. Healthcare professionals involved in neonatal care, preparation of infants for retinopathy of prematurity (ROP) examination, caregiver counselling, or ROP screening were purposively selected to capture a range of relevant clinical perspectives. Twelve healthcare professionals participated: three consultant neonatologists, one consultant ophthalmologist, three senior registrars in paediatrics, one junior registrar, and four experienced neonatal nurses. Data collection and preliminary analysis occurred concurrently. After each interview, the transcript and field notes were reviewed, coded and compared with preceding interviews using a saturation matrix that documented emerging codes and themes. Saturation was considered achieved when two consecutive interviews generated no new substantive codes or themes and the existing themes were sufficiently developed across professional groups. The research team reviewed the coding framework and agreed that further interviews were unlikely to add relevant insights.

A semi-structured key-informant interview guide was developed from the study objectives and CFIR domains. It explored participants' roles and knowledge, definitions of effective screening, application of eligibility criteria, barriers, facilitators, consequences of missed screening and recommendations for service improvement. Interviews were conducted in English by a resident who had received prior training in qualitative interviewing and was not part of participants' direct care teams. Written informed consent was obtained before each interview. Interviews lasted approximately 20 minutes, were audio-recorded

using an iPhone and transcribed verbatim. Field notes documented contextual observations and supplemented the transcripts. The interviewer was a clinician-researcher familiar with neonatal care but had no direct care relationship with participants. A semi-structured guide, reflexive field notes, independent coding and consensus review were used to reduce the influence of professional assumptions on data collection and interpretation.

Quantitative data were entered into Microsoft Access and analysed using SPSS version 23. Categorical variables were summarised as frequencies and percentages; normally distributed continuous variables as means and standard deviations; and non-normally distributed variables as medians and interquartile ranges. The quantitative analysis was descriptive, and no hypothesis testing was undertaken.

Qualitative data were managed in QDA Miner Lite and analysed thematically using an inductive-deductive approach. Initial codes were generated from the interview data and CFIR domains, grouped into categories and refined into themes. Word clouds were used only as supplementary visual summaries and did not replace thematic interpretation. Two researchers independently coded the transcripts. Differences in coding and interpretation were discussed and resolved by consensus, after which the final themes were agreed by the research team. Integration occurred during interpretation and reporting, with quantitative screening indicators juxtaposed with qualitative accounts within common themes to identify convergence, complementarity and implementation gaps.

Reporting of the retrospective observational component was guided by the Strengthening the Reporting of Observational Studies in Epidemiology statement, while the qualitative component was reported using the Consolidated Criteria for Reporting Qualitative Research checklist [11, 12].

The study was conducted in accordance with the ethical principles of the Declaration of Helsinki. Ethical approval was obtained from the Oyo State Ethics Review Board (approval number AD 13/479/952B). Written informed consent was obtained from all healthcare professionals who participated in the prospective qualitative component. The ethics committee approved the retrospective review of de-identified clinical records; individual informed consent was not required for that component. All data were anonymised and stored securely to ensure confidentiality.

Results

Participant and programme profile

The mixed-methods sample comprised 531 infants who met the study eligibility criteria and 12 healthcare professionals who participated in key-informant interviews (Table 1). Nearly half of the eligible infants were moderately preterm (49.6%), while 34.6% were very preterm and 15.8% were extremely preterm. Only 180 infants (33.9%) completed ROP screening. Among screened infants, the mean gestational age was 29.7 ± 2.3 weeks and the mean birth weight was 1.3 ± 0.3 kg. The male-to-female ratio was 1:1.1; 59.9% were delivered vaginally and 40.1% by caesarean section. The mean postmenstrual age at screening was 39.5 ± 7.0 weeks. Overall, 12.8% of screened infants were examined

beyond the recommended screening window, at a median postnatal age of 7.0 weeks (IQR, 5.0–10.0) (Table 2).

Table 1. Composition of key informants

Professional group	Number
Consultant neonatologists	3
Consultant ophthalmologist	1
Senior registrars in paediatrics	3
Junior registrar	1
Neonatal nurses	4
Median age of participants	37.1 years (IQR 32.4–52.5)
Total	12

Table 2. Quantitative profile of eligible and screened infants

Characteristic	Value
Eligible infants	531
Extremely preterm	15.8%
Very preterm	34.6%
Moderately preterm	49.6%
Infants screened	180 (33.9%)
Mean gestational age among screened infants	29.7 ± 2.3 weeks
Mean birth weight among screened infants	1.3 ± 0.3 kg
Male-to-female ratio	1:1.1
Vaginal delivery	59.9%
Caesarean delivery	40.1%
Mean postmenstrual age at screening	39.5 ± 7.0 weeks
Screened beyond the recommended period	12.8%
Median postnatal age at screening	7.0 weeks (IQR 5.0–10.0)

Theme 1: Effective screening required correct eligibility decisions, timely examination and continuity of care

Participants described effective ROP screening as more than a single retinal examination. It encompassed prevention, appropriate oxygen regulation, identification of all eligible infants, timely examination, follow-up and treatment. This broad understanding contrasted with the quantitative finding that only one-third of eligible infants completed screening, indicating a substantial gap between professional expectations and routine implementation.

“In all cases, we ensure that prevention is first in ROP. Other things involve infection control. Oxygen regulation is core. We also ensure that effective screening and treatment are provided in ways that help children who are at risk. Screening should be done after four weeks of delivery.”

(KII; Participant 1; female; 42 years; Assistant Chief Nursing Officer/neonatal nurse; ≥10 years' paediatric nursing experience)

The participant framed screening within the wider quality of neonatal care. Oxygen regulation and infection control were presented as upstream preventive actions, while examination and treatment represented downstream safeguards. The account therefore suggests that an effective programme depends on coordination between neonatal care and ophthalmology rather than on the ophthalmic examination alone.

“Here, we ensure that every eligible child is screened within the first 28 days of life and that no child is missed. After screening, every child is followed up, and those who need treatment are attended to.”

(KII; Participant 2; male; 28 years; paediatric resident on neonatology rotation)

This quotation identifies completeness, timing and continuity as the core indicators of programme effectiveness. However, the observed 33.9% screening coverage and delayed examination in 12.8% of screened infants show that these standards were not consistently achieved. The divergence between the intended pathway and the measured outcome points to implementation failure rather than lack of awareness of what good practice should entail.

Eligibility decisions were mainly based on gestational age, birth weight, oxygen exposure and clinical instability. The presence of moderately preterm infants among nearly half of the eligible population supports the need for locally appropriate criteria that capture larger or more mature infants exposed to unstable neonatal care.

“The conditions that determine which baby should be screened include birth weight below 1.5 kg, gestational age below 32 weeks, severe illness and the need for oxygen therapy.”

(KII; Participant 3; female; 48 years; consultant paediatric ophthalmologist; ≥15 years' ROP screening experience)

The account shows that staff combined numerical thresholds with clinical risk. This approach is appropriate in settings where larger preterm infants may remain vulnerable; however, variation in how staff recalled the thresholds also suggests a need for readily accessible, standardised criteria and repeated staff orientation. Figures 1–3 present word clouds illustrating the most frequently recurring concepts identified in the qualitative data.

Theme 2: Workforce, equipment and coordination constraints weakened the screening pathway

The low screening coverage was explained primarily by interacting health-system constraints rather than by a single obstacle. Participants described shortages of trained staff, frequent transfer of experienced nurses, inadequate equipment, absence of a dedicated ROP coordinator and inconsistent communication. These constraints affected identification, counselling, scheduling, preparation of infants, examination and follow-up, thereby creating multiple points at which an eligible infant could be lost from the pathway.

“Parental unwillingness to present their children for screening is a major issue. There is also the challenge of creating awareness, no ROP manager, frequent transfer of experienced nurses, repeated training of new nurses and shortages of infrastructure.”

(KII; Participant 3; female; 48 years; consultant paediatric ophthalmologist; ≥15 years’ ROP screening experience)

The quotation links caregiver behaviour with organisational weaknesses. Rather than treating missed screening as solely parental “non-compliance”, it shows that caregiver decisions occur within a system that may provide insufficient counselling, lacks a named coordinator and repeatedly loses trained personnel. Frequent staff transfers increase the burden of retraining and reduce continuity, while the absence of a coordinator weakens accountability for tracking eligible infants.

“Logistics, shortage of manpower, inadequate information, the effort required to counsel parents, missed screening dates and failure to return for follow-up are major challenges.”

(KII; Participant 4; male; 38 years; paediatric resident in neonatology; ≥5 years’ experience)

This account illustrates how workload and communication interact. Counselling was described as labour-intensive in an already understaffed environment. When counselling, scheduling and follow-up depend on busy clinical staff without protected responsibility for the programme, missed appointments become an expected consequence of the service design rather than an isolated caregiver failure.

“Lack of compliance from uninformed parents, shortage of staff and lack of enough equipment hamper the success of ROP screening in our facility.”

(KII; Participant 5; female; 44 years; Assistant Chief Nursing Officer/neonatal nurse)

The nurse's account reinforces the convergence of the barriers across professional groups. Parent knowledge, staffing and equipment were repeatedly described together, indicating that improving only one element is unlikely to close the screening gap. Equipment without trained personnel and tracking systems would remain underused; conversely, motivated staff cannot sustain timely screening without functional tools and institutional support (Figure 4).

Theme 3: Early discharge, caregiver awareness and financial or transport difficulties disrupted follow-up

The quantitative finding that 12.8% of screened infants were examined beyond the recommended period was consistent with participants' descriptions of missed appointments, rebooking and loss to follow-up after discharge. The transition from inpatient neonatal care to outpatient screening was a particularly vulnerable point. Once infants left the neonatal unit, completion of screening depended on caregivers understanding the urgency of a condition that is initially asymptomatic and being able to finance transport and repeated hospital visits.

"In many cases, parents miss the screening date and have to book another date. The consequence is that ROP cases may continue to increase in our society."

(KII; Participant 6; male; 32 years; paediatric resident on neonatology rotation)

The participant connected missed appointments with delayed detection rather than viewing rebooking as a minor administrative inconvenience. Because the therapeutic window for ROP is time-sensitive, each missed date can move an infant closer to irreversible disease. A reliable programme therefore requires active recall and escalation procedures rather than passive reliance on caregivers to return.

"Mothers who have benefited from ROP screening often return and encourage others. However, babies discharged early may not attend follow-up because of financial and logistical difficulties."

(KII; Participant 7; male; 52 years; consultant paediatrician/neonatologist; ≥18 years' paediatric experience)

This quotation captures both a barrier and a potential facilitator (Figure 6). Positive caregiver experience can generate peer advocacy, but early discharge transfers the responsibility for timely screening to families who may face transport costs, competing household demands and limited understanding of urgency. Screening before discharge when clinically and temporally appropriate, pre-booked appointments and reminder systems could reduce this transition-related loss (Figure 5).

Theme 4: Professional commitment and collaboration sustained screening despite structural limitations

Although the programme operated below the desired level, participants identified several strengths: motivated staff, positive attitudes, collaboration between neonatology and ophthalmology, existing protocols, informal peer learning, social-media communication and external technical support. These factors helped the service continue despite limited resources and represent assets that can be formalised and expanded.

“The first facilitator is the attitude of the ROP team, followed by self-drive, parents who have benefited encouraging others, teamwork and collaboration among all units involved. Stop Infant Blindness in Africa has also assisted greatly.”

(KII; Participant 3; female; 48 years; consultant paediatric ophthalmologist; ≥15 years’ ROP screening experience)

The emphasis on “self-drive” suggests that the programme depended heavily on individual commitment. While this commitment is valuable, reliance on goodwill can make services fragile when key personnel are transferred, absent or overburdened. The same quotation shows how collaboration and external support can convert individual motivation into a functioning programme, but sustainable performance requires these relationships to be supported by formal institutional structures.

Theme 5: A sustainable programme required institutional ownership, coordinated tracking and caregiver-centred support

Participants’ recommendations directly addressed the weaknesses identified in the previous themes. They called for institutional recognition of ROP screening as routine neonatal care, adequate equipment and staffing, a stronger coordination structure, improved links between ROP centres, collaboration with private facilities, community awareness, antenatal counselling and reliable follow-up systems.

“ROP screening should be institutionally recognised as part of care for newborn babies and supported with adequate infrastructure. We need better collaboration with private practitioners, stronger linkages among ROP centres, increased manpower and equipment, and an improved structure for the programme.”

(KII; Participant 3; female; 48 years; consultant paediatric ophthalmologist; ≥15 years’ ROP screening experience)

This recommendation shifts ROP screening from an optional activity led by interested individuals to a defined institutional responsibility. Formal recognition would support dedicated budgets, staffing,

equipment maintenance, reporting and accountability. Linkage with private facilities is especially important because at-risk infants may be born or stabilised outside tertiary public hospitals and referred after the ideal screening window.

“We need community awareness, improved antenatal counselling, effective and consistent monitoring and follow-up after discharge, and ROP call centres across different parts of the country.”

(KII; Participant 8; female; 50 years; Deputy Director of Nursing/neonatal nurse)

The proposed approach extends the programme beyond the hospital (Figure 7). Counselling before and after birth, centralised telephone support, appointment reminders and active tracking could improve caregiver understanding and reduce missed examinations. Together, these suggestions describe a coordinated pathway in which responsibility is shared by institutions, providers and caregivers rather than placed on families alone.

Discussion

This study integrated quantitative programme indicators with qualitative accounts from healthcare professionals to explain why ROP screening coverage remained low at a tertiary facility. Only 33.9% of eligible infants completed screening, and 12.8% of those screened were examined beyond the recommended period. The interviews showed that the gap was produced by interacting barriers across the screening pathway: variable application of eligibility criteria, workforce shortages, limited equipment, absence of a dedicated coordinator, insufficient caregiver counselling, early discharge and weak follow-up systems. At the same time, staff commitment, interdepartmental collaboration, existing protocols and external support provided a foundation for improvement.

The screening coverage observed in this study was substantially below the 60.3% reported by a recent prospective South African regional register [6]. Differences in programme maturity, tracking systems, screening capacity and the availability of ophthalmologists may partly explain this contrast. The finding is also consistent with Nigerian evidence that ROP services have expanded but remain unevenly available and dependent on local capacity [3]. The clinical importance of this gap is underscored by a Nigerian case series in which almost nine out of ten children who developed ROP blindness had never been screened [5]. Together, these findings show that screening coverage is not merely a process measure; it is directly linked to the prevention of irreversible visual loss.

Moderately preterm infants constituted almost half of the eligible population. This supports evidence that larger and more mature infants may develop severe ROP in settings where oxygen exposure and neonatal care are variable [2, 3]. Screening criteria in resource-constrained settings therefore need to balance sensitivity with feasibility. Participants understood the importance of gestational age, birth weight, oxygen exposure and severe illness, but their varying descriptions of eligibility thresholds suggest that written criteria should be readily available at the point of care and incorporated into

admission, discharge and referral documentation. Consistent documentation of retinal findings also requires standardised ROP classification terminology [13].

The main barriers mapped predominantly to the CFIR inner-setting and implementation-process domains [9]. Shortages of trained staff, frequent staff transfers, inadequate equipment and lack of a programme coordinator reduced implementation readiness and weakened execution. Similar challenges have been reported nationally: Nigerian neonatologists have described limited access to oxygen-monitoring equipment and low availability of functional screening teams [4]. International work on ROP screening technologies in resource-limited settings likewise identifies cost, training and usability as major barriers [8]. The convergence of these studies indicates that equipment procurement must be accompanied by workforce development, maintenance arrangements, role definition and programme monitoring.

Caregiver awareness and follow-up difficulties represented outer-setting influences that interacted with hospital processes. Participants sometimes described parents as “non-compliant”, but closer examination of the interviews showed that missed appointments were related to inadequate information, early discharge, transport and financial constraints, and the absence of active reminder systems. Recent evidence demonstrates that social and economic circumstances influence attendance after neonatal discharge [14]. Earlier studies similarly found that discharge or transfer without a clearly organised follow-up plan increased the risk of missed ROP care [15]. These findings support a more caregiver-centred interpretation: families require repeated counselling, written appointments, contact details, reminders and assistance navigating the transition from inpatient to outpatient care.

A notable strength was the motivation of the multidisciplinary team. Participants described strong collaboration between paediatrics, neonatology, nursing and ophthalmology, as well as support from external initiatives. Nigeria’s broader experience has shown that professional networks, national protocols, advocacy and skills transfer can rapidly expand ROP services [3]. Within CFIR, these assets reflect a favourable implementation climate and positive characteristics of individuals. However, commitment alone is insufficient. Institutionalisation is required so that programme continuity does not depend on a few motivated staff members.

The study period extended to May 2020 and therefore overlapped with the beginning of the COVID-19 pandemic. The present data were not designed to isolate the pandemic’s effect, and the interviews did not establish it as a theme; consequently, it should not be treated as an explanatory finding. Nonetheless, future analyses of programme trends should consider whether service interruptions during this period influenced screening completion or follow-up.

Strengths and limitations

The principal strength of this study is the integration of a relatively large quantitative cohort with qualitative accounts from professionals occupying different roles in the screening pathway. Presenting the findings within common themes made it possible to link low coverage and delayed screening to

specific implementation processes. The use of CFIR also provided a structured basis for distinguishing barriers related to the inner setting, outer setting, individuals and implementation process.

Several limitations should be considered. First, the study was conducted in a single tertiary hospital, which limits transferability to facilities with different staffing, referral structures and screening capacity. Second, the qualitative component included healthcare professionals but not parents or caregivers; explanations of caregiver awareness and follow-up barriers therefore reflect provider perspectives. Third, the quantitative data covered 2016–2020, whereas the qualitative interviews were conducted in 2026. The interviews may therefore reflect current practice and retrospective professional recollection rather than conditions throughout the entire quantitative period; integration should consequently be interpreted as explanatory rather than strictly contemporaneous.

Conclusions

ROP screening coverage and timeliness were suboptimal, reflecting gaps across the screening pathway. Strengthening programme coordination, staffing, equipment, caregiver counselling, discharge planning, follow-up systems and routine performance monitoring may improve timely screening and continuity of care.

Abbreviations

CFIR, Consolidated Framework for Implementation Research; IQR, interquartile range; KII, key-informant interview; ROP, retinopathy of prematurity; SD, standard deviation; SPSS, Statistical Package for the Social Sciences; UCH, University College Hospital

Declarations

Ethics approval and consent to participate

The study was conducted in accordance with the ethical principles of the Declaration of Helsinki. Ethical approval was obtained from the Oyo State Ethics Review Board (approval number: AD 13/479/952B). Written informed consent was obtained from all healthcare professionals who participated in the prospective qualitative component. For the retrospective review of de-identified clinical records, the ethics committee approved a waiver of individual informed consent.

Consent for publication

Not applicable.

Availability of data and materials

The de-identified datasets used and analysed during the current study are available from the corresponding author on reasonable request, subject to applicable ethical and institutional data-

governance requirements.

Competing interests

The authors declare that they have no competing interests.

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The authors received no specific funding for this work.

Authors' contributions

MAA, MOU and AMB conceptualised and designed the study and contributed to the investigation and data curation. JAO and MAA conducted the formal analysis and interpreted the data. All authors contributed to data collection and manuscript preparation. OOT supervised the study, while MOU provided critical intellectual input. All authors reviewed and revised the manuscript, approved the final version for publication and agreed to be accountable for all aspects of the work.

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Figures

Nematology postin - Pediatrics Unit
Informing and enlightening parents
Facilitator role
Preparing babies for screening
Specialist Pediatric - UCH
Assistant Chief Nursing

Figure 1

Participants' experience and roles in ROP screening.

First 28 days of life
Ensure no child is missed out
Effective treatment **Every child**
Infection contro
Prevention
Oxygen regulation
Screening after 4 weeks of delivery
Identifying signs of defect

Figure 2

Participants' definitions of effective ROP screening.

Less than 32 weeks
Less than 1.5kg
Babies at special care
Pre-time babies
Birth challenges
Shortage of oxygen
Severe illnesses

Figure 3

Determinants of eligibility for ROP screening.

Shortage of infrastructure
 Counselling labour
 Poor attitudes of health workers
 Insufficient binoculars Missing screening date
 Inadequate equipment Shortage of staff
Staffing issue No laser
 No Redcam
Awareness issue
 No ROP manager **Logistics issues**
Parental non-compliance
 No stable nurses ROP cases occurrence
 Parental unwieldiness
 Shortage of manpower

Figure 4

Barriers to effective ROP screening.

Rising ROP cases Inadequate follow-up
 Desire for More ROP
Missed appointments
 Booking another date
 Inadequate check up

Figure 5

Few guidelines **Positive results**
Collaborations between all units
Trainees/Neonatal Effectiveness
Attitude of ROP team **SIBA Efforts**
Increased patronage
Data **Self-drive** **Positive drive**
Team work **Social media impacts**
Effective Protocol **Quick responses**
Review of successful cases

Figure 6

Facilitators of effective ROP screening.

Improve linkages
ROP screening as care
Improve structure **Institutional support**
Incentives **ROP assurance**
Antenatal counselling
Monitoring and follow-up
Community awareness
Setting up ROP call centres
Effective collaboration
Equipment supply
Increase man power

Figure 7

Recommendations for a sustainable ROP screening programme.

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- [ROPIDIGuideS1.pdf](#)
- [GraphicalAbstract.png](#)