ISSN: 2393-8048
International Advance Journal of Engineering, Science and Management (IAJESM)
Multidisciplinary, Multilingual, Indexed, Double Blind, Open Access, Peer-Reviewed, Refereed-International Journal.
SJIF Impact Factor =8.152, July-December 2025, Submitted in November 2025

"To Assess the Impact of Involvement of Care Givers in Rop Screening of Preterm Babies in Selected Secondary Care Hospitals."

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Abstract

Background: Retinopathy of Prematurity (ROP) is a preventable cause of childhood blindness, primarily affecting preterm infants. Caregiver knowledge and involvement play a critical role in ensuring timely screening and adherence to follow-up appointments, which are essential for early detection and management of ROP.

Aim: To assess the level of knowledge among caregivers regarding ROP screening and to evaluate the effectiveness of a structured educational intervention on improving their knowledge in involving ROP Screening of babies.

Methods: A descriptive pre-experimental study with a pre-test/post-test design was conducted among 100 caregivers of preterm newborns attending a Scondary care hospital ROP screening clinic at Special Newborn care Unit. Caregivers were assessed using a structured knowledge questionnaire (maximum score 20) before and after a 30-minute structured educational session. Data were analyzed using descriptive statistics (frequency, percentage, mean, SD) and chi-square tests to evaluate the effectiveness of the intervention and associations with demographic variables.

Results: Pre-test assessment revealed that 48% of caregivers had poor knowledge, 42% had average knowledge, and 10% had good knowledge of ROP. Following the intervention, 60% demonstrated good knowledge, 30% average, and only 10% poor knowledge. The mean knowledge score increased significantly from 8.4 ± 2.8 to 15.9 ± 2.6. The chi-square test ($\chi^2 = 56.27$, $p < 0.0001$) confirmed that the intervention was highly effective. Education level and prior awareness of ROP were significantly associated with baseline knowledge.

Conclusion: The study concluded that caregiver knowledge regarding ROP screening is initially low, but a structured educational intervention significantly improves awareness and understanding. Educating caregivers is essential for promoting timely screening, follow-up compliance, and the prevention of ROP-related visual impairment in preterm infants.

Keywords: Retinopathy of Prematurity, Caregiver Knowledge, Preterm Infants, ROP Screening, Educational Intervention

ARTICLE:

Introduction: Retinopathy of Prematurity (ROP) is a proliferative disorder of the retinal blood vessels that primarily affects preterm and low-birth-weight infants. It remains one of the leading preventable causes of childhood blindness worldwide. Advances in neonatal care have increased the survival of preterm infants, but this has also led to a higher risk of ROP among this vulnerable population. Early detection and timely intervention are crucial to prevent progression to blindness.

Significance of Caregiver Involvement: Caregivers play a vital role in ensuring that preterm infants receive timely ROP screening and follow-up care. Their awareness and understanding of the condition influence compliance with screening schedules and adherence to medical advice. However, studies have reported that many caregivers have limited knowledge regarding ROP, its risk factors, and the importance of regular follow-up, which can result in delayed diagnosis and poor visual outcomes.

Rationale of the Study: Although health professionals provide counseling during hospital visits, caregiver understanding is often inadequate, especially among those with lower educational levels or limited prior awareness of ROP. Structured educational interventions

targeting caregivers can enhance knowledge, reduce anxiety, and improve adherence to ROP screening protocols. Assessing baseline knowledge and the effectiveness of such interventions is essential for planning targeted health education programs.

Aim of the Study: The study aims to assess the knowledge of caregivers regarding ROP screening in preterm babies and to evaluate the effectiveness of a structured educational intervention in enhancing their understanding. The study also seeks to explore the association between selected demographic variables and caregiver knowledge.

Literature Review:

Eneriz-Wiemer M, Liu S-D, Chu M CY, et al 2018 A cross-sectional study in four neonatal intensive care units (NICUs) in California found that many parents of very low birth weight infants lacked basic understanding of ROP. For instance, 17 % didn't know that ROP is an eye disease, and 38 % were unaware that prematurity / low birth weight are risk factors. The study also observed that limited English proficiency and low health literacy were significantly associated with lower parental knowledge. They assessed different methods of educating parents (verbal, written, online, video), but did not find any education modality that was clearly superior in improving knowledge. Parental Awareness & Compliance in India In a more recent (2025) study from northern India (Patna), only 39% of parents were aware of ROP before the first screening. The study also found that follow-up compliance (i.e., bringing babies for scheduled ROP check-ups) was about 71%, with dropouts due to financial burden (~26%), lack of understanding (~22%), and transport issues (~19%) being significant barriers. There was a significant correlation between parental education level and ROP awareness, suggesting socio-demographic factors play a role. The authors argue for structured parental education programs in NICUs and reminder systems to improve adherence. A smaller cross-sectional study in Kerala (India) with 30 parents revealed that though 83.3% knew ROP is a blinding disease, 70% did not follow up strictly as per the recommended screening schedule. The delay in follow-up ranged from 7 to 160 days (median 30 days). The authors concluded that despite counseling and educational pamphlets, follow-up adherence was poor, highlighting a need to strengthen ROP counselling programs. [1]

Sinha M, Anand A, Karn MK 2025 In a survey of 37 caregivers (of infants screened for ROP), most accurately remembered their child's screening and the reason for it. However, caregivers of infants who developed ROP reported greater long-term family impact: more of them said they "gave things up" (e.g., personal time or activities) and saw friends or family less often, compared to caregivers of children who did not have ROP. Those infants with ROP also tended to have more eye-related complications, see more eye specialists, etc., which translates into more follow-up burden. The authors note that ROP's long-term caregiving demands, such as multiple specialist visits, can have a significant family cost.[2]

Song W, Hui M, Khitri M 2025 A cross-sectional study in India (2025) assessed 110 primary caregivers of children with ROP: ~71% experienced a moderate caregiver burden, and a substantial fraction reported moderate to severe depressive symptoms. The burden was measured in domains including socioeconomic, emotional, psychological. This indicates that besides the clinical burden of ROP on the child, caregiver mental health is significantly affected, which could, in turn, influence their capacity to adhere to screening or follow-up protocols.[3]

Singh R, Singh V 2025 A two-center cross-sectional study (Turkey) investigated anxiety levels in parents who were either present during the first ROP examination, or not present. They used the State-Trait Anxiety Inventory (STAI) and a Visual Analogue Scale (VAS) to assess parental anxiety. Findings: Parents who were present during the exam showed a small increase in state anxiety post-exam, while those who were not present had a decrease on average. Based on this, the authors tentatively suggest not having parents present might be better to manage parental anxiety, although they call for more controlled studies. They also

discuss that clinicians sometimes worry that having parents in the room could disrupt the examination (especially if the baby is distressed), or add to parents' stress. [4]

Research Methodology:

Research Design: A pre-experimental, one-group pre-test post-test design was adopted to assess the effectiveness of a structured educational intervention on caregiver knowledge regarding Retinopathy of Prematurity (ROP) screening in preterm babies. This design allows comparison of knowledge levels before and after the intervention within the same group.

Research Approach: A quantitative research approach was used to systematically measure caregiver knowledge and evaluate statistical differences following the intervention.

Study Setting: The study was conducted in the ROP screening clinic / Neonatal Intensive Care Unit (NICU)/Special Newborn Care Units(SNCU) of a selected Secondary care hospital in October 2025.

Study Population: The population consisted of caregivers of preterm babies attending ROP screening services at the selected hospital.

Sample Size: A total of 100 caregivers were selected for the study.

Sampling Technique: A non-probability purposive sampling technique was used. Caregivers who met the inclusion criteria and were available during the data collection period were invited to participate.

Inclusion Criteria:

Caregivers who:

✔ Accompanied preterm infants for ROP screening
✔ Were willing to participate
✔ Could read or understand the local language / English
✔ Were available during data collection

Exclusion Criteria:

Caregivers who:

✗ Had previously attended structured ROP education sessions
✗ Were critically ill or unable to participate
✗ Were not the primary caregivers

Description of the Tool:

Tool I: Demographic Data Sheet

Included variables such as:

- Age
- Gender
- Education
- Occupation
- Residence (urban/rural)
- Relationship to the infant
- Previous awareness of ROP

Tool II: Structured Knowledge Questionnaire

- Consisted of 20 multiple-choice items on:
- Definition of ROP
- Causes and risk factors
- Importance of screening
- Follow-up care
- Role of caregivers
- Maximum score: 20
- Scoring pattern:
- 0–7 = Poor knowledge

- 8–14 = Average knowledge
- 15–20 = Good knowledge

Validity and Reliability:

- The tool was validated by experts in ophthalmology, neonatology, and nursing research.
- Reliability was established using test–retest method, yielding a reliability coefficient of r = 0.82, indicating good reliability.

Data Collection Procedure:

Step 1: Pre-test:

- Caregivers were approached, consent obtained, and the pre-test knowledge questionnaire was administered.

Step 2: Educational Intervention: A structured teaching session was provided, lasting 30 minutes, including:

- PowerPoint presentation
- Posters/leaflets
- Demonstration
- Interactive discussion

Topics covered: importance of ROP screening, risk factors, early detection, caregiver responsibilities, follow-up schedule.

Step 3: Post-test:

- After 7 days, the same structured knowledge questionnaire was administered to assess knowledge gain.

Results: This study maily focuses on involvement of caregivers who have preterm and low birthweight babies for their ROP screening. Based on Demographic data I collected respondents awareness in this study.

1.Demographic Characteristics of Caregivers (n = 100)

Table 1. Demographic Variables:

Variable Category	Frequency (n)	Percentage (%)
Age (years)		
18–25	28	28%
26–35	54	54%
>35	18	18%
Gender		
Female	78	78%
Male	22	22%
Education Level		
No formal Education	12	12%
Primary	26	26%
Secondary	42	42%
Graduate& above	20	20%
Residence		
Urban	40	40%
Rural	60	60%
Relationship to infant		
Mother	78	78%
Father	22	22%
Previous awareness of ROP		
Yes	35	35%
No	65	65%

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2.Knowledge Score Analysis (Pre-Test vs Post-Test)

Knowledge was assessed using a structured questionnaire (maximum score = 20).
Knowledge levels were categorized as:

- Poor: 0–7
- Average: 8–14
- Good: 15–20

Table 2. Distribution of Knowledge Levels Before and After Intervention (n = 100)

Knowledge Level	Pre-test n (%)	Post-test n (%)
Poor (0–7)	48 (48%)	10 (10%)
Average (8–14)	42 (42%)	30 (30%)
Good (15–20)	10 (10%)	60 (60%)

Interpretation: After educational intervention, the proportion of caregivers with good knowledge increased from 10% to 60%.

Table 3. Mean Knowledge Scores

Test	Mean ± SD	Minimum	Maximum
Pre-test	8.4 ± 2.8	3	15
Post-test	15.9 ± 2.6	9	20

Interpretation: There was a substantial improvement in mean knowledge scores after the intervention.

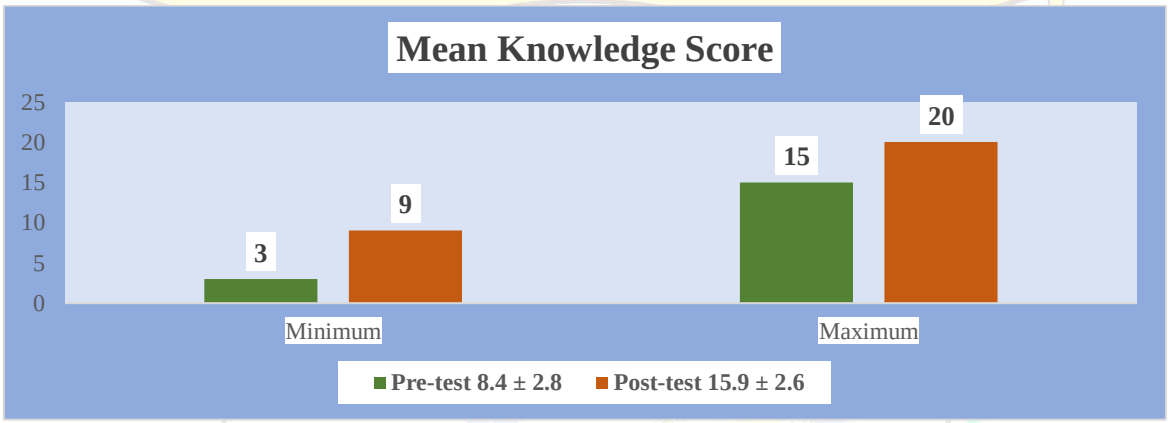

Figure No.1: Men Knowledge score

3.Chi-Square Test for Effectiveness of Intervention

The chi-square test was used to determine the effectiveness of the educational intervention on knowledge level.

Table 4. Chi-Square Test for Pre-test vs Post-test Knowledge Levels

Variable Significant Association?	χ^2 value	p-value
Age No	3.12	0.21
Gender No	0.85	0.35
Education Level Yes	14.56	0.006*
Residence (urban/rural) No	2.94	0.08
Previous awareness of ROP Yes	19.74	<0.001*

Significant at $p < 0.05$

Interpretation:

- Higher education level correlates with better knowledge.
- Caregivers who had prior awareness of ROP had significantly better **pre-test knowledge.**
- Age, gender, and residence did not show significant associations.

Summary of Key Findings

- Majority caregivers were mothers (78%).
- Only 35% had previous awareness of ROP.

- Pre-test: Most caregivers had poor (48%) or average (42%) knowledge.
- Post-test: 60% achieved good knowledge levels.
- Mean score improved from 8.4 to 15.9.
- Chi-square test confirmed that the educational intervention was highly effective ($p < 0.0001$).
- Education level and previous awareness were significantly associated with pre-test knowledge.

Conclusion: The present study assessed the knowledge of caregivers regarding Retinopathy of Prematurity (ROP) screening in preterm babies and evaluated the effectiveness of a structured educational intervention. Findings revealed that caregivers initially had low to average levels of knowledge, with nearly half demonstrating poor understanding of ROP, its risk factors, and the importance of timely screening and follow-up.

After the educational intervention, there was a marked improvement in knowledge scores, with the proportion of caregivers demonstrating good knowledge increasing from 10% in the pre-test to 60% in the post-test. The mean knowledge score also significantly increased from 8.4 to 15.9. The chi-square analysis ($p < 0.0001$) confirmed that the intervention was statistically effective.

Demographic analysis showed that education level and previous awareness of ROP were significantly associated with pre-test knowledge, indicating the need for targeted education among less literate caregivers.

Overall, the study concludes that structured educational interventions are highly effective in improving caregiver knowledge about ROP screening and follow-up care. Enhancing caregiver understanding can contribute to better screening compliance and ultimately support the early detection and prevention of ROP-related visual impairment among preterm infants.

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