Barriers to Referral uptake from Primary to Secondary Eye Care in the L V Prasad Eye Institute Network in South India.

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LV Prasad Eye Institute

Poster No. P11

INTRODUCTION

- An estimated 2.2 billion people worldwide experience near or distance vision impairment (VI), with at least one billion cases being potentially preventable or are currently unaddressed.[1]
- To address this challenge, the World Health Organization had proposed universal eye health (UEH) using integrated people centred eye care (IPCEC) approach.[2]
- One way of achieving UEH is the primary eye care approach i.e. vision centre (VC) approach
- The L V Prasad Eye Institute (LVPEI) has its pyramidal model of eye care. This model enables a scalable approach to eye care, allowing for most cases to be managed at the primary care level (VCs) and those requiring referral, are referred to secondary centres (SCs). Complex cases which cannot be managed at SC are referred to the tertiary centres (TC) or to the centre of excellence (CoE).
- Although more than 80-90% of eye conditions can be managed at the primary and secondary levels of care, many individuals do not make effective use of these services, including referral services.
- To date, no studies have investigated the barriers affecting referral uptake from primary-level vision centers to secondary centers.
- Therefore, this study aims to identify the barriers hindering the uptake of referral services from primary level VCs to higher level SCs as well as assess risk factors for these barriers to uptake of services.

METHODS

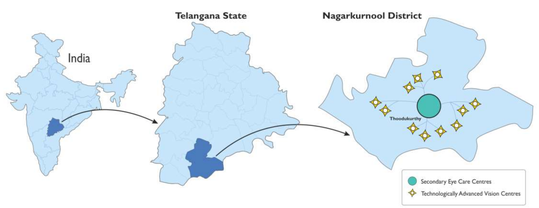

Figure 1: Geographic distribution of vision centres surrounding a secondary centre within Nagarkurnool (old Mahabubnagar) district, Telangana.

- This cross-sectional study was conducted using data from 10 VCs surrounding a SC located at the Kuchakulla Ramachandra Reddy Eye Centre (KRREC), is in Thoodukurthy village, Mahabubnagar district, Telangana, South India (Figure 1).
- The data was collected from the electronic medical records of participants referred to KRREC from 10 VCs.
- The study was approved by the institutional ethics committee (Ethics Ref No LEC-BHR-R-09-21-745) of the Hyderabad Eye Research Foundation; L V Prasad Eye Institute, Hyderabad, India
- The study included participants who received primary eye care at VCs and were referred to an SC (KRREC) between July to December 2019 and July to December 2020.
- Participants were classified as compliant if they attended the SC within one year of referral. Non-compliance was defined as failure to attend within this time frame. Non-compliant participants were interviewed regarding the reasons for non-adherence.

RESULTS

- Between July and December 2019 and July and December 2020, 2508 patients were referred to the SC. Among the 2508, 1930 (76.9%) were available for the study as participants.
- Of the 1930 participants, 1507 (78%) were interviewed. Among those, 938 (62.2%) were compliant, and 569 (37.8%) were non-compliant.
- The mean age of these participants was 54.64 years (SD: 14.28 years) and 47.5% were female.
- *Table 1.*Comparison of compliant and non-compliant groups by demographics, type of referrals, visual impairments, and socioeconomic status.

Factors	Complaint (N=938) n(%)	Non-compliant (N=569) n(%)	P value
Age (years) Mean ± SD	54.68(14.49)	54.58(13.93)	0.89
Gender			
Male	481 (51.28)	310 (54.48)	0.23
Female	457(48.72)	259(45.52)	
Referred to teleconsultation			
Referred	140 (14.93)	67(11.78)	0.09
Not referred	798(85.07)	502(88.22)	
Distance from vision centres (Kilometers) Mean ± SD	45.16(23.26)	38.42(15.98)	<0.001
Type of referral			
Emergency	156(16.63)	79(13.88)	0.15
Non-emergency	782(83.37)	490(86.12)	
Presenting visual acuity (PVA) in better eye			
Normal (better than or equal to 6/18)	450 (48.18)	272(47.97)	0.94
Any visual impairment (worse than 6/18)	484(51.82)	295(52.03)	
Family head			
Head of family	474(50.53)	314(55.18)	0.08
Not head of family	464(49.47)	255(44.82)	
Marital Status			
Married	698(74.41)	396(69.60)	0.04
Unmarried	240(25.59)	173(30.40)	
Types of family			
Nuclear	609(64.93)	349(61.34)	0.16
Extended	329(35.07)	220(38.66)	
Type of house			
Katcha	174(18.55)	135(23.73)	0.02
Pakka	764(81.45)	434(76.27)	
Education			
Formal education	295(31.45)	162(28.47)	0.22
No education	643(68.55)	407(71.53)	
Main earning member			
Primary wage earner	402(42.86)	269(47.28)	0.09
Not a primary wage earner	536(57.14)	300(52.72)	
Medical insurance			
Medical insurance present	783(83.48)	482(84.71)	0.53
Medical insurance not present	155(16.52)	87(15.29)	
Monthly family income (rupees)			
<16,000	453(48.29)	257(45.17)	0.24
≥16,000	485(51.71)	312(54.83)	
COVID-19			
Pre-COVID	442(47.12)	261(45.87)	
Post-COVID	496(52.88)	308(54.13)	0.64

Table 2. Risk factors for non-compliance (univariable and multivariable analysis).

Factors	Univariable OR (95% CI)	P-value	Multivariable OR (95% CI)	P-value
Age (years)	1.00(0.99-1.01)	0.90	0.99(0.98-1.00)	0.08
Gender				
Male	1.00		1.00	
Female	0.88(0.71-1.08)	0.23	0.84(0.63-1.12)	0.23
Referred to teleconsultation				
Referred	1.00		1.00	
Not referred	1.31(0.96-1.80)	0.09	1.41(1.00-1.99)	0.05
Mean distance from vision centers (kilometers)	0.98(0.98-0.99)	<0.001	0.98(0.98-0.99)	<0.001
Type of referral				
Emergency	1.00		1.00	
Non-emergency	1.24(0.92-1.66)	0.16	1.30(0.91-1.86)	0.15
Presenting visual acuity (PVA) in better eye				
Normal (better than or equal to 6/18)	1.00		1.00	
Any visual impairment (worse than 6/18)	1.01(0.82-1.24)	0.94	0.97(0.77-1.23)	0.83
Family head				
Head of family	1.00		1.00	
Not head of family	0.83(0.67-1.02)	0.08	0.86(0.64-1.14)	0.30
Marital Status				
Married	1.00		1.00	
Unmarried	1.27(1.01-1.60)	0.04	1.32(1.02-1.71)	0.04
Type of family				
Nuclear	1.00		1.00	
Extended	1.17(0.94-1.45)	0.16	1.20(0.93-1.54)	0.15
Type of house				
Katcha	1.00		1.00	
Pakka	0.73(0.57-0.94)	0.01	0.81(0.62-1.06)	0.13
Education				
Formal education	1.00		1.00	
No education	1.15(0.92-1.45)	0.22	1.44(1.09-1.90)	0.01
Main earning member				
Primary wage earner	1.00		1.00	
Not a primary wage earner	0.84(0.68-1.03)	0.09	0.85(0.64-1.12)	0.25
Medical insurance				
Medical insurance present	1.00		1.00	
Medical insurance not present	0.91(0.68-1.21)	0.53	0.95(0.70-1.28)	0.73
Monthly family income (rupees)	0.99(0.99-1.00)	0.68	0.99(0.99-1.00)	0.48
Covid-19				
Pre-COVID	1.00		1.00	
During-COVID	1.05(0.85-1.30)	0.64	1.05(0.84-1.31)	0.66

- Non-compliance was significantly associated with distance from VCs (p <0.001), marital status (p = 0.04), and type of house (p = 0.02) (Table 1).
- Multivariable analysis showed that not getting referred for teleophthalmology services (adjusted OR: 1.41, 95% CI: 1.00-1.99), unmarried status (adjusted OR: 1.32, 95% CI: 1.02-1.71), and lack of formal education (adjusted OR: 1.44, 95% CI: 1.09-1.90) remained significant predictors of non-compliance(Table2).
- Participants living further away from VCs (adjusted OR: 0.98, 95% CI: 0.98-0.99) had better compliance than those living closer to VCs(Table 2).
- The major barriers to referral uptake, as reported by non-compliant participants, were attitudinal (60.5%), followed by economic (12.1%), and other medical or ocular barriers (9.3%)(Table 3).

Table 3 The primary barriers preventing the non-compliant group from taking up referral services.

Categories	Major Barriers	Numbers (%)
Economics	I cannot afford to travel cost to the centre	4(0.70)
	I cannot afford the treatment costs	65(11.42)
	Cannot afford lost wages of me or accompanying person	0(0)
Logistics	There is nobody to accompany me to the secondary centre	29(5.10)
	I do not know where the secondary center is located	1(0.18)
Distance	The secondary centre is very far from my home	6(1.05)
	Lack of transport	0(0)
Fear	I am afraid of travelling to the secondary centre	6(1.05)
	I am afraid of the procedure for which I have been referred for	12(2.11)
	Fear of COVID-19	8(1.41)
Awareness	I do not understand why I need to go a secondary centre	3(0.53)
	I was not aware of referral	9(1.58)
Family	The dominant family member does not feel the need for further travel and treatment	4(0.70)
Attitude	I am too busy to go to the eye centre for further treatment	137(24.08)
	Can manage now and will go later	44(7.73)
	I am happy with the treatment at VC and do not require further treatment at this time	163(28.64)
Medical or ocular barriers	I was informed that my vision would not improve	1(0.18)
	Other health problems prevent me from travelling to the eye centre	37(6.50)
Institutional barriers	Old age – I do not see the need for treatment at my age	15(2.64)
	L V Prasad did not help to arrange the appointment and facilitate the referral	5(0.88)
	I am not satisfied with the treatment I have received thus far from L V Prasad	8(1.41)
	I decided to visit another eye centre /visited other centre	5(0.88)
Others	Others	7(1.23)

*Others: Spouse illness: 4(57.1%), Did not visit the centre due to COVID-19:2(28.6%), Waiting for husband's eye surgery: 1 (14.3%).

CONCLUSION

- This study is the first to examine non-compliance with referrals from VCs to SC, revealing a 38% non-compliance rate.
- Attitudinal barriers and financial hardships were the primary reasons for non-compliance and teleophthalmology should be encouraged at the primary level, which can additionally improve referral uptake.

How This Work Aligns with Countdown to 2030: Challenges and Opportunities for Research and Data

- Our study addresses the data gaps with referral compliance in rural eye care systems—an area critical to the 2030 targets for Universal Health Coverage (UHC) and preventable vision loss.
- This study addresses a key challenge in achieving Universal Eye Health by 2030: the underutilization of referral pathways from primary to secondary care, despite structured eye health networks.

Lessons Learned

- The most common reason for non-compliance was attitudinal barriers.
- Referral for teleophthalmology was associated with better follow-up.

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Financial support – Hyderabad Eye research foundation

Conflicts of interest- None

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