

# Improving the Efficiency of Refraction Services at a Tertiary Care Eye Hospital Using an Action Research Methodology

<sup>1</sup>Innayath Kabir, <sup>2</sup>Meeta Tyagi, <sup>3</sup>Shakti K Gupta

## ABSTRACT

**Background:** The hospital under study is a 300 bedded tertiary care eye hospital in New Delhi, India. The hospital being the apex tertiary care eye institute of the country faces a constant issue of demand-supply mismatch. Due to the demand-supply, the appointment system for refraction posed problems of uncertainty and non-availability of appointments for the same resulting in delay in diagnosis and hence patient dissatisfaction.

**Objective:** The main aim of the exercise was to ascertain the cause and to find an amicable solution for the uncertainty in the appointment system for refraction.

**Methodology:** Action research methodology was applied to the process in the form of planning, implementation and evaluation in 2 cycles. The existing registration process was analysed in the first phase and the problems identified. In the first cycle, the detailed workflow process analysis and capacity calculation of Refraction services was carried out following which the problems were identified and actions were planned in a collaborative manner. The planned actions were implemented and evaluated. Based on the evaluation of the cycle 1 changes were planned for cycle 2 and implemented.

**Results:** The problems identified in cycle 1 were absence of knowledge about the present capacity, slow registration process, uncertainty of appointment for refraction and lack of display of timings for registration and confirmation of appointments. The calculated capacity for refraction varied between 156 and 120 due to variation in the availability of consultation chambers. The changes planned were sensitisation of staff to the changes, increasing the capping limit of appointments to 160 in the morning and 80 in the afternoon (which included 33% above the capacity to cater to no shows). The results of cycle 1 were evaluated and the problems were identified. The corrective actions were planned for cycle 2 and planned actions were implemented. The capping limit for appointments was increased to 200 in the morning and 100 in the evening

**Conclusion:** The main objective of the study was to address the patient grievance with regard to uncertainty in appointment by the participatory approach of action research methodology. In conclusion, action research is socially oriented and the intended

outcome will therefore be evidenced through changes in social situations, systems and conditions.

**Keywords:** Action research, Refraction services, Uncertainty in appointment.

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## INTRODUCTION

As any organization grows with time and in size, it requires assessment of its ongoing processes and adjustment to the changing situation. The processes, defined once, after thorough work up require change with time. However it is well known that "change" in an organization, is always challenged with resistance. The entire efforts of improvement go waste, if the stakeholders involved refuse to adopt the improvement plan. Only a collaborative approach with step wise planning and implementation leads to a successful process change implementation.

Action research is one of the methodologies adopted in these situations as it bridges the divide between research and practice. It rejects the concept of a two-stage process in which research is carried out first by researchers and then applied by practitioners. The findings of the research are fed back directly into practice with the aim of bringing about change. It directly addresses the problem of the persistent failure to make a difference in terms of bringing about actual improvements in practice. Action research places emphasis on the full integration of action and reflection, and on collaboration between those involved in the enquiry process.<sup>1</sup>

No social research process can actually avoid changing the situation it investigates: human beings will always respond (in one way or another) when research in any form appears on their scene.<sup>2</sup>

There is a dual commitment in action research to study a system and concurrently to collaborate with members of the system in changing it in what is together regarded as a desirable direction.<sup>3</sup>

<sup>1,2</sup>Resident Administrator, <sup>3</sup>Medical Superintendent

<sup>1,2</sup>All India Institute of Medical Sciences, New Delhi, India

<sup>3</sup>Dr. R.P. Centre for Ophthalmic Sciences, All India Institute of Medical Sciences, New Delhi, India

**Corresponding Author:** Meeta Tyagi, Resident Administrator, All India Institute of Medical Sciences, New Delhi, India, e-mail: mtyagi14@yahoo.co.in

Action research is characterized by spiralling cycles of problem identification, systematic data collection, reflection, analysis, data-driven action taken and finally, problem redefinition. Action research is not about learning why we do certain things, but rather how we can do things better.<sup>4</sup>

Our study was aimed at improving the efficiency of the refraction services with minimal addition of resources.

Refraction examination is the first step of eye examination, any delay in this leads to delay in further diagnosis and treatment. The primary requirement at a tertiary care eye institution is a quality and efficient refraction services. The agony of the patients waiting for days for their refraction with no certainty on when the services will be provided to them was understood by the administrators of the study hospital and action research methodology was adopted to bring changes in the present processes to improve the efficiency of refraction services.

The flexible spiral process of action research, involving stages of planning, implementation, evaluation and modification allowed action (change and improvement) and research (understanding and knowledge) to be achieved at the same time.

### Problem Statement

The study hospital is a Tertiary Care Eye Hospital in New Delhi, India. The hospital being the largest public sector eye hospital of the country always faces a demand supply mismatch. In the month of February, 2017 a group of patients reported to the Medical Superintendent with a grievance that they were denied consultation for refraction as the number of patients crossed the ceiling limit of 150 appointments and they were not getting a confirmed appointment date, lack of certainty causes multiple visits for refraction examination. There were recurrence of incidences of such complaints from patients regarding delay and uncertainty of appointment for refraction.

The purpose of the study was to ascertain the cause and to find an amicable and sustainable solution for this.

### METHODOLOGY

Initially the workflow process was studied. Thereafter two cycles of planning, implementation and evaluation steps were carried out.

### Present Scenario

There are five consultation chambers, which are functional in two shifts; 9–1 and 2–4 PM on Monday, Wednesday, Thursday and Friday and single shift 9–1 on Tuesdays and Saturdays, however the chambers are not

available exclusively for refraction as on certain days, some of them are used for routine consultation.

There is one registration counter for registration of refraction patients.

The patients advised refraction on the previous days start queuing up in front of the registration counters as early as 7:30 AM. After 9:30 AM the patients from the doctor's consultation chambers also join the queue.

The security staff deployed collects the cards and deposits them at the registration counter. Once he has collected 150 cards he asks the rest of the patients to come the next day, however the patients do not leave the queue till refused from the register counter.

### Registration Process is Manual

Writing the patients detail in the register and writing the room number and patient's number in the queue to that room on the patient's card. The registration starts at 8:30 AM, after 150 patients are registered the rest of the patients are asked to try at 12 PM for the refraction in the evening shift (except for Tuesday and Saturday) or the next day. The patients who decide to wait for the evening shift again queue up. The registration starts at 1:30 PM, after 15 patients are registered the rest of the patients are asked to come on the next day.

The next day they come early and start queuing, if not accommodated continue coming on subsequent days till accommodated.

### ACTION RESEARCH CYCLES

#### Cycle One

#### *Problems Identification and Planning Action*

The movement at the refraction counter were observed for five successive days. The written records of the patient's complaints were collected. With this initial data, the administrator held discussions with the stakeholders, that is chief optometrist, medical record officer, the data entry operators, nursing informatics services (NIS) staff and the security supervisor. The problems identified and the action planned is as below:

#### *Absence of Knowledge about Present Capacity*

It was brought out during the discussion that the limit of 150 patients has been set long time back when there were more rooms for providing services and the rooms were exclusively used for refraction.

*Cause Identification:* Lack of scientific data on present capacity for refraction.

*Action Planned: Assessment of the Capacity:* The total capacity was planned based on a past observational

study,<sup>5</sup> where 90 observations were made to see the time taken for refraction of one patient, showed that the time taken for refraction of one patient is 5.59 minutes with a Standard Deviation of 2.27 minutes, though the highest limit of time for refraction at 99 CI% brings it to value of 7 minutes and 4 seconds. However further interaction and involvement of refractors reached a mutually agreed of 10 minutes per refraction. Table 1 shows the capacity per room, shift and day wise.

### Slow Registration

As stated the patients start queuing up at 7:30 AM and registration starts at 8:30 and total time taken for 150 registrations is 150 minutes (8:30 to 11:00 AM).

*Cause Identified:* Only one registration counter, registration is manual and time consuming.

*Action Planned:* Change in registration process: (a) Increase number of registration counters for refraction to two, (b) Computer based registration, installation of two computers for registration, (c) Training of the staff for the registration "Appointment Module" to be provided by the NIS, (d) Sensitisation of staff: All the staff that is the optometrist, registration staff and the security staff were sensitised to the new appointment system to be carried out.

### Uncertainty for Refraction

The reason for patient grievance was the uncertainty related to the date of their refraction.

*Cause Identified:* No appointment system.

*Action Planned:* Introduction of appointment system: It was decided to start with 100% appointment with some over booking to cater to the vacant slots anticipated to arise out of "no shows"

### Lack of Display of Registration Time

*Cause Identified:* The registration timing was displayed only at the registration window.

*Action Planned:* Display of registration timing at identified prominent places.

Further based on the capacity calculated and to cater to the no shows, the capping limit of appointment

was set at 33% above the calculated capacity, to 160 patients for morning shift and 80 patients for evening shift.

### Implementation

Time taken for this step was one month.

- Computers were installed, short training and sensitization of the staff was carried out.
- The timings displayed as below:
  - 8:30–10:30: Confirmation of appointments and issue of current day's appointments
  - 11:00–1:00: Subsequent days appointment for patients who report from the OPD
  - 2:00–4:00: Confirmation of appointment and subsequent days appointment
- Two counters were made functional from 8:30 to 10:30 AM and separate queues were made for the current day patients and patients with previous appointment.

### Evaluation

The evaluation was carried out after one week, through direct observation of the process and analysis of data for appointment and registration. Table 2 shows the data of registration

### Cycle Two

#### Problems Identified and Planning

The observations and the registration data was discussed with the stakeholders, the problems identified and the action planned are as below:

#### Overutilization of Slots

On an average 27 slots (22.5%), out of the calculated capacity were being over utilized:

- *Cause Identified:* Lack of discipline in reporting of appointment patients: The patients with appointment reported even after the displayed registration timing that is 10:30 AM and demanded for the refraction service, as they had appointment for the day. Accommodating them led to controversies with the walk-in patients, which in turn resulted in

**Table 1:** Capacity of the chambers for refraction

Day Room No. Time	Mon		Tues		Wed		Thurs		Fri		Sat
	9-1	2-4	9-1	9-1	2-4	9-1	2-4	9-1	2-4	9-1	
E-1	---	12	24	24	---	---	12	24	---	24	
E-2	24	12	24	24	12	24	12	24	12	24	
E-3	24	12	24	24	12	24	12	24	12	24	
E-4	24	12	24	24	12	24	12	24	---	24	
E-5	24	12	24	24	---	24	12	24	---	24	
Capacity/shift/ room	96	60	120	120	36	96	60	120	24	120	
Refraction Capacity/day	156		120	156		156		144		120	

**Table 2:** Registration data after cycle 1

Days	No of appt given (A)	No of appt patients turned up(B)	Vacancy created (120-B)	Walk in/ late reporting appt. accommodated	Overutilization
Day 1	178	139	0	0	0
Day 2	144	122	0	60	60
Day 3	144	117	3	24	21
Day 4	172	114	6	29	23
Day 5	146	99	21	43	22
Day 6	168	115	5	28	23
Day 7	164	109	11	21	10
Day 8	150	117	3	39	36
Day 9	166	123	0	45	45
Day 10	162	105	15	41	26
Average	159.4	116	6.4	33	26.6

accommodating more patients than the calculated limit.

- *Action Planned:* (i) The reporting time for the appointment patients was fixed. The staff was instructed to inform the patients while giving appointment that in case they report later than 9:30 AM, their appointment will be cancelled.

The appointment slips given to the patient to have the written instruction “Reporting time till 9:30 AM, in case of reporting late the appointment shall be cancelled.”

(ii) *Reduction in % overbooking:* The ratio to the no shows, the capping limit of appointment which was set at 33% above the calculated capacity, to cater to the no shows was reduced to 25%, that is to 150 patients for morning shift and 75 patients for evening shift.

**Delay in Information about the Vacant Slots**

The patients with appointment arrived as per their convenience.

- *Cause Identified:* No reporting time for appointment patients is fixed
- *Action Planned:* The timing of the appointment confirmation in the morning was revised as 8:30 to 9:30 AM, during this time both the counters to be used for confirmation of appointment.

The subsequent day appointment patients and the patients desirous to be accommodated the same day were asked to wait till 9:30 (these patients start reporting usually after 9:15 AM).

**Underutilization of Current Booking Counter**

This queue depended on information of appointment patients turning up, it was underutilized.

- *Cause Identified:* No time difference between confirmation of appointment and registration of new (current booking) patients.
- *Action Planned:* Action taken in point no. 2 resolves the problem.

**Implementation**

The planned actions were taken.

**Evaluation**

The evaluation was carried out after two weeks, through direct observations and analysis of data for appointment and registration. Table 3 shows the data of registration.

- Patients with appointment started reporting within the time limit.
- The vacancy created was timely assessed and was utilized for the current day patients.
- There were no over utilization of services.

**Achievements after Two Cycles**

- The capacity based on workflow process worked out.
- The complaints from the patients related to uncertainty addressed completely.
- Change of manual registration to computer based registration.
- Appointment system introduced.

**DISCUSSION AND CONCLUSION**

Action research has long been the method of choice when undertaking research in clinical practice improvement.

**Table 3:** Registration data after cycle 2

Days	No of appt given(A)	No of appt patients turned up (B)	Vacancy created (120-B)	Walk in patients accommodated	Vacant slots
Day 1	155	68	52	46	6
Day 2	152	71	49	46	3
Day 3	162	62	58	50	8
Day 4	151	55	65	61	4
Day 5	191	81	39	23	16
Day 6	140	56	64	61	3
Day 7	141	60	60	53	7
Day 8	136	63	57	39	18
Day 9	126	63	57	53	4
Day 10	159	72	48	10	38
Average	151.3	65.1	54.9	44.2	11



It is a method aimed at engendering ownership by the participants in order to sustain practice change. Action Research is socially oriented and intends that outcomes will be evidenced through changes in social situations, systems and conditions.<sup>6</sup>

Eather et al.<sup>6</sup> in their study on patient safety utilized the PDSA cycle, referring to the non static healthcare environment in relation to high staff turnover in form of shift duties, attrition etc., their study was focused for a long term continuous intervention however in our study the staff involved in the process was on regular duties and the intervention was continual rather than continuous.

Searson has used the action research methodology in introducing bedside handovers in a coronary care unit wherein the system adopted was designed by the nurses and they dealt with any on-going problems as a group. In our study the problems along with their solutions were identified in group discussions with the staff involved in the registration and refraction process.

The focus of our study was on action with the aim to address the patient's grievance as early as possible, the objective was to be fulfilled within a constrained environment of demand supply mismatch already faced by the organization.

The objective was achieved through the repeated cycle of plan, implement, evaluate. The uncertainty faced by the patients was removed completely. The efficiency of the refraction clinic was improved. The participatory approach of the action research methodology helped up smoothly changing over from the manual registration and appointment system to computerized registration and appointment.

## REFERENCES

1. Nichols R. Action research in healthcare: the collaborative action research network healthcare group. *Educational Action Research*. 1997 Jun 1;5(2):185-192.
2. Winter R, Munn-Giddings C. *A handbook for action research in health and social care*. Psychology Press; 2001.
3. Gilmore T, Krantz J, Ramirez R. Action based modes of inquiry and the host-researcher relationship. *Consultation: An International Journal*. 1986.
4. Ferrance E. Themes in education action research. Northeast and Islands Regional Educational Laboratory at Brown University. 2000.
5. Tyagi M. Application of Operations Research Techniques in improving Patient Flow processes at Dr Rajendra Prasad Centre for Ophthalmic Sciences, AIIMS, New Delhi. 2014. (Unpublished MHA thesis by author).
6. Eather BI, Chiarella ME, Donoghue J. Plan, Do, Study, Act cycles, as an alternate to action research for clinically based inquiry. *International Journal of Research in Nursing*. 2013 Jul 1;4(2):34-39.