INTRODUCTION
Glaucoma is a chronic eye disease causing blindness in millions of people worldwide.

Ocular hypotensive eye drops are the most common treatment for lowering the intraocular pressure and to slow the progression of the disease.

During lifelong follow-up, a daily, correct administration by the patient is required.

However, it is reported nearly half of the patients with glaucoma could not use the eye drops properly.

Unlike oral medicines, eye drops require patients to use proper technique for successful medication administration.

This requires not only instilling a single drop accurately into the conjunctival cul de sac of the eye, but also without contacting eye drop container with the ocular surface or adnexa.

Poor eye drop instillation in adherence not only leads to reduced treatment effectiveness but also increases costs in such chronic disease.

Systemic side effects, infection, or trauma can also be induced due to overdose or contacting the eye drop container with the eye.

Accordingly, this study aimed to explore the status of patients in busy clinical setting of a developing country and to evaluate the determinants of the drop instillation skill.

AIM OF THE STUDY
To evaluate the technique of eye drop instillation in glaucoma patients and the factors associated with a good technique.

MATERIALS AND METHODS
STUDY DESIGN: HOSPITAL BASED CROSS SECTIONAL STUDY
STUDY PERIOD: MARCH 2019 TO MAY 2019
STUDY SOURCE: PATIENTS ATTENDING TO GLAUCOMA CLINIC IN DEPARTMENT OF OPHTHALMOLOGY, GOVT REGIONAL EYE HOSPITAL, VISAKHAPATNAM.

SAMPLE SIZE: 100 patients.

INCLUSION CRITERIA
Subjects with diagnosis of glaucoma
Patients aged over 18 years old,
Patients using self-administering eye drops with no compliance aids more than 6 months,
Patients having better visual acuity no less than 20/200 in either eye.

Patients using more than one topical hypotensive medications in one or both eyes.

EXCLUSION CRITERIA
Patients having disability in communication or physical impediments to eye drop use

METHODOLOGY
Eye drop instillation technique—subjects were first escorted to an exam room and instructed to instill a 5 ml sterile artificial tear solution just as they usually did at home.

They were free for a second attempt while they were not satisfied with their first attempt but no prompting was given.

The right eye was assigned if the patients had prescribed eye drops for both eyes.

The entire process was observed.

Skill score system was based on previous studies.

Perfect instillation technique was defined as being to instill a single drop into the conjunctival cul de sac of the eye, on target, and no contamination.

Participants were also asked to recall whether they had any instruction on skills of instilling eye drops previously, and if so, from whom.

Gender, age, race, knowledge of using eye drops, and instruction history were associated with total skill score

Table 1: Scheme used to grade eye drop instillation technique:

<table>
<thead>
<tr>
<th>Description of technique</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good technique, on target, and no contamination</td>
<td>5</td>
</tr>
<tr>
<td>Awkward technique, on target, and no contamination</td>
<td>4</td>
</tr>
<tr>
<td>On target but contaminates by touching the bottle tip to the lashes or lid</td>
<td>3</td>
</tr>
<tr>
<td>On target but contaminates by touching the bottle tip to bulbar conjunctiva or cornea</td>
<td>2</td>
</tr>
<tr>
<td>Not on target, and no contamination</td>
<td>1</td>
</tr>
<tr>
<td>Not on target and contaminates the bottle tip by touching the eye, eyelid, or lashes</td>
<td>0</td>
</tr>
</tbody>
</table>

RESULTS
Total number of cases – 100. Males were 54, females – 46, mean age was 54.23 years.

Table 2: Knowledge of using drops:

<table>
<thead>
<tr>
<th>Interval between each drop</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 minutes</td>
<td>99%</td>
</tr>
<tr>
<td>10 minutes</td>
<td>99%</td>
</tr>
<tr>
<td>30 minutes</td>
<td>1%</td>
</tr>
</tbody>
</table>
Table 3: Eye drop instillation technique evaluation

<table>
<thead>
<tr>
<th>Technique of Eye Drop Instillation</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good technique and no contamination</td>
<td>2%</td>
</tr>
<tr>
<td>Awkward technique, on target, and no contamination</td>
<td>52%</td>
</tr>
<tr>
<td>On target but contaminates by touching the bottle tip to the lashes or lid</td>
<td>18%</td>
</tr>
<tr>
<td>On target but contaminates by touching the bottle tip to bulbar conjunctiva or cornea</td>
<td>16%</td>
</tr>
<tr>
<td>Missed eye while eye drop instillation</td>
<td>12%</td>
</tr>
</tbody>
</table>

DISCUSSION
Glaucoma is a slowly progressive eye disease, and prescribed glaucoma regimen adherence has long been an issue with glaucoma patients. Improper administration of eye drops is often of a variety of unintentional noncompliance and under reported.

Unawareness is not only from patients but also from eye care providers especially in busy clinical practices.

Approximately 80% of patients instill their own eye drops by themselves and mostly, no delivery aids are adopted.

Our study indicates that only 54% patients managed to successfully instill eye drops into conjunctival sac.

In a similar study, Dietlein et al. reported that only 57% patients managed to instill eye drops in the conjunctival sac.

Our study showed 18% patients got contamination by contacting tip of bottle to eye lashes/lids on their first attempt to instill the drops.

16% patients got contamination by contacting tip of bottle to bulbar conjunctiva/cornea.

12% patients missed the eye while instilling drops.

The mean age according to this study is 54.23 years.

Most patients (90%) controlled the interval between eye drops more than 10 minutes.

2% patients knew to press dacrocyst area after instilling the eye drops.

CONCLUSION
This study clearly shows that a vast majority of glaucoma patients are not correctly instilling eye drops.

This can lead to serious consequences on the quality of life of the patients.

It also highlights the importance of patient education with regard to self instillation of eye drops whenever glaucoma topical medications are prescribed and a check on this by the eye care providers during follow-up visits.

REFERENCES