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Evaluation of quality and patient satisfaction during endoscopic procedure: A cross sectional study from South Asian country

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Abstract

Objective: To assess the quality of gastrointestinal (GI) endoscopic procedures and patient satisfaction in endoscopy suite of South Asian country.

Methods: Patients coming to the endoscopic suite of Aga Khan University Hospital (AKUH) were interviewed and assessed in this cross-sectional study. Quality of GI endoscopic procedures was evaluated using assessment tools as suggested by The American Society of Gastroenterology. Patient satisfaction after the procedure was assessed using a modified GHAA-9 questionnaire. The questionnaire was statistically evaluated using Pareto analysis and Spearman rank correlation.

Results: In this study, 323 patients were evaluated with a mean age of 43±14.36 years. Out of all the procedures 251(77.7%) were gastroscopies while 72(22.3%) were colonoscopies. Patients undergoing different therapeutic procedures were 121 in number (37.46%). Pre-procedure education was rated as excellent or very good by 91.3% of the patients. Midazolam was used for sedation with an average dose of 3 mg. Technically successful procedures included 99.2% gastroscopies and 98.6% colonoscopies. Mean score of patients regarding satisfaction on mGHAA-9 questionnaire was 30 ± 3.965. Patient dissatisfaction calculated in our study was 3.6% with the length of time spent waiting before procedure and length of time waiting to get an appointment for the procedure contributing to 90% of dissatisfaction.

Conclusions: Quality of endoscopic procedures at our centre is at par with international standards with acceptable complication rate and good patient satisfaction (JPMA 60:990; 2010).

Introduction

Gastrointestinal endoscopy during the years has evolved as an important diagnostic tool for the evaluation of most of the gastrointestinal problems. In last two decades, role of gastrointestinal endoscopy has increased many folds because of the establishment of many wide ranges of

therapeutic endoscopic procedures.¹ These include life saving emergency procedures like injection sclerotherapy and oesophageal variceal band ligation for upper gastrointestinal bleeding or elective procedures like percutaneous endoscopic gastrostomy (PEG) or biliary stenting through endoscopic retrograde cholangiopancreatography (ERCP).

Providing best possible patient care is the most important goal of any health care facility. Recently, there has also been increasing demand to track and improve patient outcomes. The Institute of Medicine (IOM) released a report in 2001, "Crossing the Quality Chasm: A New Health System for the 21st century", advocating widespread changes in health care to improve quality.² It is very important to assure that high quality endoscopic procedures are performed to provide best possible care. Studies have shown that satisfied patients are more likely to comply with the health care provider.^{3,4} A high quality endoscopic procedure ensures correct diagnosis. It is also essential that therapy is properly performed with minimal risk and ensures satisfaction of the patients. The American Society of Gastrointestinal Endoscopy (ASGE) and American College of Gastroenterology (ACG) joint task force have recently published a set of quality indicators for gastrointestinal endoscopic procedures.⁵⁻⁸ They have stressed the need of monitoring quality in all endoscopic facilities. They concluded that all quality indicators may not apply in all practice settings and they should be modified according to the local requirements. Similarly regarding the measurement of patients' satisfaction a modified version of the Group Health Association of America-9 (GHAA-9) patient satisfaction survey was proposed.

Living in a third world country, our health care system has limited resources and cost is a major concern of many of our patients. Effective and efficient use of finite resources and ensuring quality maintenance is very important.

There was no such data available from our country or regional countries about the quality outcome of endoscopic procedures. This survey has guided us to identify and prioritize factors related to satisfaction with GI endoscopy.

Patients and Method

Assumed prevalence of satisfied patients was 70%. With a margin of error of 5% and level of significance of 5%, we calculated the required sample size as 323 patients. Taking 10% non-responders, our inflated sample size was of 358 individuals.

All patients undergoing Esophagogastroduodenoscopy (EGD) and Colonoscopy at the Aga Khan University hospital endoscopy suite were assessed and interviewed after the procedure. Patients were selected by random sampling. Study was approved by institutional ethical review committee.

The demographics of the patients like patient age, gender, type and dose of sedative used, total procedure time, endoscopist performing the procedure, nature of procedure (diagnostic, therapeutic) and complications both early and delayed were noted in a structured manner.

Two parameters were considered for evaluation

in this study:

1. Quality assessment of Gastrointestinal Endoscopies using the guidelines put forward by the American Society of Gastroenterologist.

2. Evaluation of patient satisfaction using the Modified GHAA-9 questionnaire.⁹

The selection of quality indicators was based on the availability of routine clinical data, easiness to use and ability to measure desired outcome. The following quality indicators were used for the assessment.

- 1. Patient Education:** Pre-procedure education provided to the patients by the physician and paramedical staff was assessed through an interview before the patient was discharged from the endoscopy suite. Education regarding the indication of the procedure, preparation for the procedure, alternatives of the procedure, potential complications of the procedure and the impact on patient future management was assessed. It was scored using an ordinal five value Likert scale (poor, fair, good, very good, excellent).¹⁰

- 2. Sedation:** Two outcome measures were used to assess the quality of sedation administered to the patients during the endoscopies.

- a. Frequency of reversal agent (flumazenil and naloxone) used.

- b. Adequacy of sedation as indicated by the patient through pain. Pain during the procedure was determined by the verbal numerical pain (VPN) scale from 1 to 10 with 1 being the least and 10 being the maximum, and the severity of pain was divided into either mild pain (pain scale 1-4), moderate pain (pain scale 5-7) or severe pain (pain scale 8-10).

- 3. Procedure complications:** Complications were defined as adverse events which necessitate intervention.¹¹ Complications occurring during and after the procedure were further divided into

- a. Immediate: Occurring during the procedure or prior to discharge from the endoscopy unit.

- b. Delayed: Occurring up to seven days after the procedure.

All patients were seen in the clinic after seven days or contacted on phone to determine the delayed complications. Measures taken to resolve these complications were also accounted.

- 4. Procedure Success:** Successful completion of the procedure was a predetermined quality indicator. For EGD, reaching the distal duodenum and retro flexion in the stomach while reaching the caecum in colonoscopy was a measure of considered success. (The gastroenterologist checked the completion of the procedure which was later verified by the research officer through the procedure report.)

5. Patient Satisfaction: Patient satisfaction was

another quality indicator which was assessed according to the modified GHAA-9 questionnaire. The questionnaire was derived from the Group Health Association of America-9 survey.⁹ This was a previously validated instrument modified by the American Society for Gastrointestinal Endoscopy to make it applicable to endoscopy patient satisfaction measurement.¹² The seven core items of the modified Group Health Association of America-9 survey comprised of the questionnaire used in this study. A score of 1-5 was assigned to each item response, with 1 representing a "poor" and 5 representing an "excellent" satisfaction rating. The maximum possible total satisfaction score was 35. Modified GHAA-9 questionnaire was used after permission from the primary author. (The Performa and questionnaire was filled by a research officer who was not directly involved in the procedure).

Two special variables were used to evaluate questionnaire answers. First we added scores of questions one to seven, the range of which could vary between 7 and 35 (total score). Higher scores represent a greater degree of satisfaction. Second was so-called problem rate which is the percentage of answers scored poor or fair out of all questions answered by all patients included in the study. The problem rate was calculated by adding all poor or fair answers in all questionnaires, and dividing them by the total number of questions asked and multiplying the results of this division by 100. The calculation can be expressed by the following formula.

$$\frac{\Sigma \text{ Poor fair answers} \times 100}{\Sigma \text{ Times each question was evaluated}}$$

As well as this problem rate, the percentage of poor or fair answers was calculated for each individual question. A confidence interval of 95% was estimated for each of these percentages.¹³

Graphic representation for quality assessment:

Quality assessment has special graphic representation and analysis methods. Of the various graphic analysis methods in use, the Pareto charts were chosen.¹⁴ Main causes of problems that are worth solving i.e. vital few were identified by this method.¹⁵

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Spearman rank correlations were used to assess the magnitude, direction and statistical significance of the association of patient ranking between pairs of items. This was done to explore potential domains of patient satisfaction with aspects of endoscopy. The aim of this analysis was to explore the potential domains of endoscopy patient satisfaction. Positive correlations between items rankings imply that both items tended to be assigned a high (i.e. highly important to satisfaction) or a low (i.e. less important) numerical ranking.¹⁶

Results

A total of 358 patients were initially selected for the study. Of these 14 were excluded because of language barrier, 11 refused their consent for the participation and 10 were unable to understand the questions because of post procedural sedative effects. Patients who were finally interviewed having attended GI endoscopy unit were 323 in number. Out of 323 procedures, 251(77.7%)

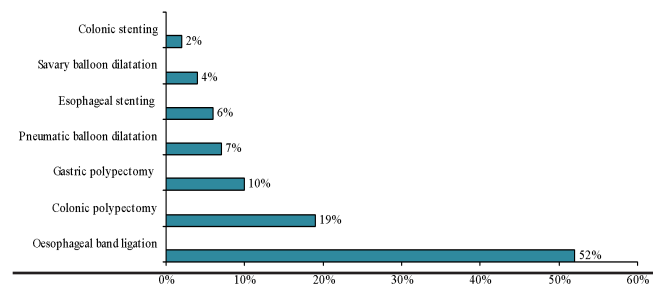


Figure-1: Details of therapeutic procedures, n=121 (%).

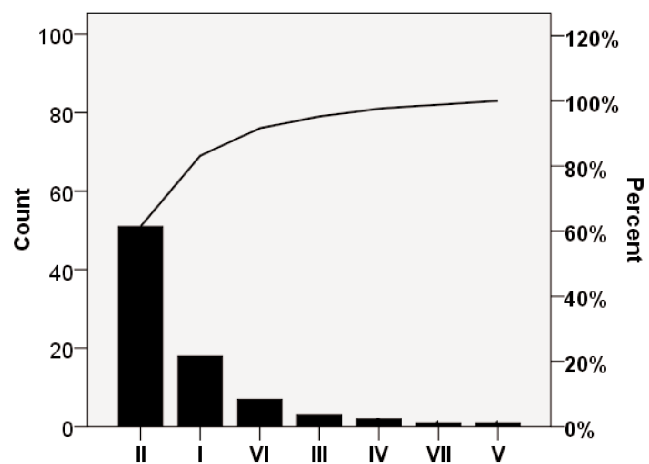


Figure-2: Pareto chart depicting each questionnaire question for the problem rate for all patients. Figures under the column represent the percentage of 'poor' or 'fair' answers over the overall total of 'poor' and 'fair' answers. The black line represents the accumulated percentage. I) waiting on day; II) time for an appoint; III) explanation; IV) Physician manner; V) Physician skill; VI) Problem rate; VII) Staff manners.

were gastroscopies and 72 (22.3%) were colonoscopies. Those under going different therapeutic interventions were 121 (37.46%) in number and the details of these therapeutic procedures are shown in Figure-1. The details of patient education for endoscopic procedures are shown in Figure-2.

Main drug used for sedation was intravenous Midazolam. Mean dose of midazolam used for gastroscopic procedures was 3.83±1.08 mg. With this dose 241 patients (96%) complained of mild pain while 10 (4%) experienced moderate pain but none complained of severe

Table-1: Modified-GHAA 9 questionnaire.

1. How long did you wait to get an appointment?
2. Length of time spent waiting at the office for the procedure?
3. The personal manner of the physician who performed your procedure?
4. Technical skills of the physician who performed your procedure?
5. Personal manner of the nurses and supporting staff?
6. Adequacy of explanation of what was done for you were all your questions answered?
7. Over all rating of the visit?

Table-2: Percentage of fair/poor response to each question.

| Question | Total (n=323) | 95% CI |
|--------------------|---------------|-----------|
| Appointment | 18 (5.6%) | 3.1-8.1 |
| Waiting on day | 51 (15.8%) | 11.8-19.8 |
| Manner (Physician) | 3 (0.9%) | -0.1-1.9 |
| Skill (Physician) | 2 (0.6%) | -0.2-1.4 |
| Manner (Staff) | 1 (0.3%) | 0.6-3.8 |
| Explanation | 7 (2.2%) | -0.3-0.9 |
| Problem rate | 3.6% | |

Table-3: Item-Item Spearman rank correlation (p values).

| | Appointment | Waiting on day* | Manner- Physician* | Skill- physician* | Manner- Staff* | Explanation* | Overall Rating* |
|------------------|-------------|-----------------|--------------------|-------------------|----------------|--------------|-----------------|
| Appointment | 1.000 | 0.473 | 0.521 | 0.488 | 0.573 | 0.536 | 0.496 |
| Waiting on day | | 1.000 | 0.508 | 0.413 | 0.495 | 0.480 | 0.508 |
| Manner-Physician | | | 1.000 | 0.738 | 0.574 | 0.492 | 0.543 |
| Skill-Physician | | | | 1.000 | 0.576 | 0.459 | 0.43 |
| Manner-staff | | | | | 1.000 | 0.685 | 0.593 |
| Explanation | | | | | | 1.000 | 0.628 |
| Overall Ratio | | | | | | | 1.000 |

*P value <0.05.

pain. For colonoscopy the mean dose of midazolam was 4.27 ± 1.25 mg after which 66 patients (91.6%) had experienced mild pain, 4 (5.55%) complained of moderate pain while only 2 (2.77%) had severe pain. In this survey none of the patients required reversal of sedation because of IV midazolam. Regarding the procedure success, out of 251 gastroscopies, 249 (99.2%) were completed i.e. endoscopist was able to reach the second part of the duodenum while out of 72 colonoscopic procedures 71 were completed that is the operator was able to reach the caecum. Clinical co-relation between procedure indication and endoscopic findings was noticed in 311(96.2%) patients. There were no immediate complications during or after the procedure nor there were any delayed complications noted in the subsequent follow up after seven days of the procedure.

Patient satisfaction was assessed using the modified GHAA-9 questionnaire (as shown in Table-1) and each question was evaluated separately as well as the overall score was noted. The mean scoring by the patients on

تبدیل شدہ GHAA-9 سوالنامہ

- 1۔ آپ کو ڈاکٹر صاحب کے کلینک میں ملاقات کے لیے کتنا انتظار کرنا پڑا؟
- 2۔ معائنے سے پہلے انڈوسکوپ روم میں آپ کو کتنی دیر انتظار کرنا پڑا؟
- 3۔ جن ڈاکٹر صاحب نے آپ کا معائنہ کیا ان کا رویہ کیسا تھا؟
- 4۔ جن ڈاکٹر صاحب نے آپ کا معائنہ کیا ان کی مہارت کیسی تھی؟
- 5۔ نرسز اور ڈاکٹر صاحب کے معاون افراد کا آپ کے ساتھ رویہ کیسا تھا؟
- 6۔ کیا آپ کو آپ کے سارے سوالات کے جوابات دیئے گئے؟
- 7۔ آپ کا معائنے کے بارے میں مجموعی تاثر کیسا ہے؟

endoscopic procedures was 30.22 ± 4.01 while the mean scoring by the patients on colonoscopic procedures was 29.47 ± 3.74 , which indicates the highest degree of satisfaction. The percentage of patients who rated each question 'fair' or 'poor' can be seen in Table-2. The problem rate was 3.6% (83 'fair' or 'poor' responses out of a total of 2261 questions asked.). The 'vital few', totalling 90% of the problem rate were questions on the length of time spent waiting at the office for the procedure and length of time waited to get an appointment (Figure 2).

The relationship between each pair of items based on patient ranking was assessed using the Spearman rank correlation (Table-3) which showed strong positive correlation ($r=0.738$) between the physician manner and the physician skills. Positive and significant correlation was also noted among pairs of the following items: (1) explanation of the procedure and personal manner of the staff ($r=0.685$), (2) explanation of the procedure and overall rating ($r=0.628$), (3) skill of the physician and manner of the staff ($r=0.576$).

Discussion

Quality improvement programmes are gradually being introduced into all areas of medical practice. Gastrointestinal endoscopy units all around the world have incorporated these kinds of internal programmes for various years. A high quality endoscopy performed in a particular set up ensures that the patient receives the indicated procedure by which correct and clinically relevant diagnosis is made. This should be accomplished with minimal risk to the patient.⁶ AKUH is a JCIA (Joint Commission Internal Accreditation) accredited health care facility provider. Annually we perform about 6000 endoscopic procedures at Aga Khan University hospital with patients coming from all over the country to avail good quality health care. Patients referred to the endoscopy suite are both inpatients and out patients. The procedures that are performed include both diagnostic and therapeutic interventions.

One of the quality indicators put forward by the ASGE is the patient education because it is of tremendous significance that the patients who are undergoing any medical procedure should be properly educated by the medical staff regarding the different aspects of the procedure. In our study we found that 97% of patients had a sound knowledge of the indication of the procedure, preparation for the procedure, alternatives, potential complications and the impact on future treatment and only 3% did not have any satisfactory knowledge regarding the procedures (Figure-2). Conscious sedation is routinely used by the gastroenterologist during GI endoscopic procedures. Endoscopy requires adequate and safe sedation of short duration for which different sedative drugs are used in different setups around the globe.¹⁷ In this study majority of the patients either complained of no or minimal discomfort with average safe dose of IV midazolam (3-5 mg). Similarly, none of the patients required any reversal of sedative medications like naloxone or flumazenil during the study period. This shows efficacy and safety of the drug for sedation.

Immediate complications were not noticed in the study, while 5 (7%) patients after colonoscopy experienced mild abdominal pain that lasted for 3-4 days but there was no need for any intervention. The studies conducted by Zubarik R, et al^{18,19} at the Georgetown University Hospital USA found out that most frequent delayed complications occurring after the upper GI endoscopy were throat discomfort and abdominal pain while the most common delayed complications that occurred after the colonoscopy were abdominal pain and rectal bleeding.

Procedural success was achieved in 99% of the cases. The mean satisfaction score of our patients was 30 by using a questionnaire put forward by the Group Health Association of America-9 modified by ASGE, while in another study

conducted by Del Rio et al¹⁵ the mean satisfaction score was 29. Study conducted by Hare wood et al⁹ using a telephone questionnaire found a mean score of 32. One of the significant outcomes of our study was to find out the problem rate which in quality perception is an opportunity. The two main problems which significantly affected the overall patients' satisfaction in our study were the waiting time for the patients before the procedure and the waiting time to get an appointment. These two concerns were considered as a 'vital' in the overall patient satisfaction signifying the fact that improvement on these two factors will increase the patient satisfaction further more. In two separate studies conducted by Del Rio et al¹⁵ and Moayyedi et al²⁰ authors found that waiting time on the day of the examination has a lesser influence in patient satisfaction. The study showed that waiting time on the day of the appointment had a major influence on patient's satisfaction and an observation was made that the patients who had to wait a longer time before the procedure scored less on the overall satisfaction.

We identified the potential domains of endoscopy patient satisfaction by doing an item-item correlation between pairs of items in the mGHAA-9 questionnaire. The pairs of items that were statistically significant in this study were physician's manner and skills, explanation of the procedure and personal manners of the staff, explanation of the procedure and overall rating by the patient and lastly the skill of the physician and manner of the staff.

The main limitation of the study is that this was a single centre study. The priorities indicated may reflect those exclusively of a specific patient population although the patients are geographically diverse coming not only from different provinces of Pakistan but also other neighbouring countries like Afghanistan. This kind of study should be conducted in different hospitals throughout the region where endoscopic procedures are performed. This will ensure comparison between different centres and allow study of areas that require improvement.

The use of Likert scale in the mGHAA-9 questionnaire also has its limitations due to the fact that patients were unable to differentiate between responses like excellent and very good or fair and poor. This fact was also identified by R Yacavone et al¹⁶ in their study who proposed that rankings were necessary as opposed to Likert scale in evaluation of patient satisfaction.

Conclusion

Quality of endoscopic procedures at the centre where study was conducted is at par with international standards with acceptable complication rate and good patient satisfaction. This study is the first of its type in Pakistan, and similar sort of studies should be conducted in other

developing countries in order to improve the patient satisfaction and quality of endoscopic procedures.

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