Annals of Gastroenterology (2016) **29,** 188-195

Long-term patient satisfaction of gastrointestinal endoscopic procedures

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Abstract

Background We prospectively assessed patient satisfaction in a Greek Academic endoscopy facility.

Methods Consecutive outpatients filled a satisfaction questionnaire right after their endoscopy (D1), 3 days (D3) and 3 months (M3) later. Overall patient satisfaction was measured by their willingness to repeat endoscopy in our facility and to further recommend it. Participant satisfaction regarding pre-procedural, procedural and post-procedural issues was measured using a five-step Likert scale in 19 items with 4 and 5 scores indicating favorable responses. Pareto analysis was used to determine service issues requiring improvement. Late adverse events were recorded at D3 and M3 assessments.

Results Over six months, 501 patients participated (89.4% and 87.8% response rate at D3 and M3 assessments, respectively). More than 97% of the participants would repeat the procedure in our facility and would recommend our endoscopy service, at all three assessments. Pareto analysis identified waiting time until the appointment and on the day of the examination, discomfort during and after the endoscopy, time to obtain the pathology report and overall management of the patient problems as the issues requiring improvement. No predictor of high satisfaction score has been identified. No serious late adverse events were reported.

Conclusion Despite the overall high levels of patient satisfaction, management of patient discomfort and organizational issues need improvement.

Keywords Colonoscopy, endoscopy, gastroscopy, patient, satisfaction

Ann Gastroenterol 2016; 29 (2): 188-195

Introduction

While millions of diagnostic and therapeutic endoscopic procedures take place worldwide annually [1], patients become more demanding when they choose their endoscopists [2]. Therefore, providing quality endoscopy service emerges as an important need with various metrics being proposed as endoscopy quality indicators [3]. Pre-procedural quality indicators include, among others, adequate indication for endoscopy and proper acquisition of informed consent; intra-procedural indicators include sedation and findings documentation, high adenoma detection and cecum intubation rates etc.; and post-procedural indicators comprise documentation of patient's provided instructions, late adverse events recording and evaluation of patient satisfaction.

However, there is paucity of data and lack of validated instruments to measure patient satisfaction with endoscopy service. On site self-filled, mail or phone back questionnaires have been used to determine issues requiring improvement from the patient's point of view [4-7]. While there is data regarding short-term – ranging from minutes after endoscopy until weeks later [5,8,9] - patient satisfaction, data on evaluation of long-term patient satisfaction is lacking. As part of our continuous quality improvement program [10], we conducted a prospective cohort study to assess short- and long-term patient satisfaction and to define fields to be improved regarding our service provision in a Greek Academic endoscopy facility.

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Conflict of Interest: None

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Received 21 October 2015; accepted 12 December 2015

DOI: http://dx.doi.org/10.20524/aog.2016.0011

Patients and methods

Patients

From January 2014 until June 2014, outpatients undergoing upper and/or lower gastrointestinal endoscopies were invited to fill a paper-printed satisfaction questionnaire right after their recovery and before discharge from the endoscopy facility (D1). Three days (D3) and three months later (M3), we called the participants and asked once again their opinion. If contact failed for three consecutive calls or the patient denied participation, the survey was terminated. All the procedures, mixed - diagnostic and therapeutic - lists were carried out by or under the supervision of three board-certified, experienced gastroenterologists.

Questionnaires

Participant willingness to undergo an endoscopy by the same endoscopist in our facility and to recommend our facility for endoscopy was assessed at all three assessments (D1, D3 and M3, respectively) by a binary Yes/No question.

We used three different questionnaires, one for each assessment (D1, D3, M3), based on the modified Group Health Association of America-9 (mGHAA-9) questionnaire [11] and on the questionnaire provided by the American Gastroenterological Association (AGA) Institute [12]. At D1 and D3 assessments, patients evaluated organizational, pre-procedural and procedure-related issues. Late adverse events were recorded at D3 and M3, while issues regarding long-term satisfaction were evaluated three months post procedure.

Organizational pre-procedural (questions Q3 - Q7), procedural (Q8 - Q15 and Q21 - Q28) and post-procedural (Q16 - Q18, Q29 - Q31 and Q37 - Q39) questionnaire items were rated using a five-step Likert scale, with 1 indicating poor, 2 fair, 3 neutral, 4 good and 5 the best level of satisfaction. Scores 1, 2 and 3 were arbitrarily considered unfavorable, while 4 and 5 favorable. In order to examine temporal changes in patient satisfaction scores between D1 and D3 assessments, we used 11 identical questions - Q8 to Q20 and Q21 to Q31 - for the two assessment time points. At D1 three pre-graduate medical students, who had no participation to the examination, handed over the questionnaire to patients. Patients were approached when they were fully recovered and they had received their final endoscopic report and appropriate medical instructions. Questionnaire completion by the patient took place in a quiet, comfortably furnished room in our facility and lasted 15-30 min. Study questionnaires can be found in Supplemental Table. The Attikon University General Hospital Institutional Review Board approved the survey and participants provided signed informed consent at enrollment.

Study endpoints

1) Overall patient satisfaction was measured by participant willingness to undergo endoscopy again by the same endoscopist in our facility, if needed, and to recommend our facility for endoscopy; 2) identification of service deficiencies requiring improvement; and 3) recording of late adverse events.

Statistical analysis

Data analysis was performed using the software statistical program Statistical Packages for the Social Sciences (SPSS) version 22.0 (Chicago, Illinois, USA). Quantitative data are expressed as mean (±SD or ±SME) according to the distribution normality and categorical data as number (%). We used Student's *t*-test to analyze continuous quantitative variables and non-parametrical tests to analyze categorical and non-continuous quantitative variables. For the 11 common questions at D1 and D3 assessments, a cumulative score was calculated by summing up the relative items scores. We used Spearman's *r* to examine correlations and linear regression analysis to identify predictors for high cumulative satisfaction score (independent variable); variables associated with high cumulative satisfaction score in the univariate analysis were the model's dependent variables and the unstandardized coefficient (B) 95% confidence intervals (95%CI) are presented. Significance for all statistical methods was defined as $P<0.05$.

We used Pareto analysis to identify issues requiring improvement in our endoscopy service [4,5,9]. We performed two sets of Pareto analysis using data from D1 and D3 assessments to examine temporal changes in patient complaints. The two data sets consisted of the negative answers in 19 items: Pareto D1 included the negative responses in 16 (Q3 - Q18) and 3 items (Q37 - Q39) from D1 and M3 assessments, respectively; Pareto D3 included data from 11 identical to D1 items (Q21 - Q31) re-evaluated at D3 assessment, items related to facility's organizational issues derived from the D1 (Q3 - Q7) assessment and the aforementioned M3 (Q37 - Q39) items. Cumulative cutoff for Pareto analysis was set up to 80%.

Results

Patient characteristics

Of 588 consecutive outpatients examined in our facility during the 6-month survey period, 87 denied to participate. Reasons for participation denial or exclusion from the analysis included hurry (n=18, 21%), denial to consent without providing any justification (n=29, 33%), inability to fill the questionnaire (n=25, 29%), while there were 15 (17%) incomplete questionnaires. Therefore, 501 consecutive patients were enrolled at D1 assessment. Almost half of them had previous endoscopic experience and the most frequent indications for endoscopy were investigation of upper gastrointestinal symptoms (30%), anemia - rectal bleeding (17%), and surveillance colonoscopy (17%). Participants' and non-participants' baseline characteristics are shown in Table 1. There was no statistical differences between the two groups for any of their characteristics.

Among the 501 enrolled patients, 53 did not reply at D3 assessment and three months later (M3) the response rate was 87.8% (440/501). As shown in Table 2, the overall cumulative satisfaction score was 52.88±0.146 for D1 and 52.27±0.198 for D3 assessments, respectively (P=0.002). In univariate analysis, absence of previous endoscopic experience (P=0.008) and undergoing both endoscopic procedures (P=0.017) were associated with high cumulative satisfaction score immediately after endoscopy. However, none of these factors remained statistically significant in multivariate analysis: B= -0.486 (95%CI: -1.02 - 0.04), P=0.07 for previous endoscopic experience and B= 0.489 (95%CI: -0.63 - 1.61), P=0.39 for undergoing both procedures. At D3 assessment, no variable was associated with high cumulative satisfaction score. When comparing the cumulative satisfaction scores of the first two assessments, both genders (P<0.041), younger patient age (P=0.002), absence of previous endoscopic experience (P<0.001), undergoing upper gastrointestinal endoscopy (P=0.002), and diagnostic procedures (P<0.001) were related to significant different scores in favor of D1, as shown in Table 2.

Table 1 Patient characteristics

	Participants n=501	Non-participants n=87
Sex, n (%)		
Female	231 (46)	42 (48)
Male	270 (54)	45 (52)
Age, years±SD	58.4±14.2	59.3±11.5
Procedure, n (%)		
Gastroscopy	254 (51)	44 (51)
Colonoscopy	217 (43)	36 (41)
Both endoscopies	30 (6)	7 (8)
Previous experience, n (%)		
Yes	248 (49)	42 (48)
No	253 (51)	45 (52)
Procedure indication, n (%)		
Epigastric pain – Dyspepsia – GERD	153 (30)	25 (29)
Rectal bleeding – Anemia	84 (17)	17 (20)
Polypectomy follow up	84 (17)	12 (14)
CRC screening – family history	54 (11)	9 (10)
Constipation	8 (1.6)	2 (2)
Diarrhea	7 (1.4)	1 (1)
Other	11 (22)	21 (24)
Type of procedure, n (%)		
Diagnostic	393 (78.4)	71 (81.6)
Therapeutic	108 (21.6)	16 (18.4)

GERD, gastroesophageal reflux disease

Study endpoints

Overall patient satisfaction

99.2%, 98.2% and 97.5% of the participants gave a positive answer to the question "Would you undergo again the same examination by the same endoscopist in our facility, if needed?" at D1, D3 and M3 assessments, respectively. Likewise, 98.8%, 98.9% and 98.6% of the participants would recommend our facility for endoscopy service at D1, D3 and M3 assessments, respectively. As presented in Table 3, none of the patient characteristics was related to patient willingness either to repeat the procedure by the same endoscopist in our facility (P>0.07) or to recommend it (P>0.08).

Endoscopy service deficiencies requiring improvement

Table 4 summarizes the items that accounted for the 80% of the negative responses in Pareto D1 and Pareto D3 analysis.

Table 2 Cumulative scores presented as mean (SEM) for the 11 questionnaire items at day 1 and day 3 assessments

	Day 1	P-value*	Day 3	P-value**	P-value***
Overall	52.88 (0.146)		52.27 (0.198)		0.002
Sex		0.369		0.379	
Male	52.83 (0.193)		52.20 (0.259)		0.015
Female	53.00 (0.187)		52.35 (0.305)		0.041
Age		0.196		0.060	
<65	52.78 (0.177)		51.90 (0.277)		0.002
>65	53.14 (0.205)		52.94 (0.233)		0.440
Previous experience		0.008		0.997	
Yes	52.66 (0.207)		52.44 (0.250)		0.491
No	53.15 (0.174)		52.09 (0.307)		<0.001
Examination		0.017		0.617	
Colonoscopy	52.56 (0.203)		52.16 (0.296)		0.187
Gastroscopy	53.15 (0.197)		52.27 (0.289)		0.002
Both procedures	53.40 (0.348)		53.16 (0.582)		0.812
Type of procedure		0.471		0.242	
Diagnostic	52.92 (0.158)		52.10 (0.237)		<0.001
Therapeutic	52.88 (0.250)		52.86 (0.313)		0.872

P*, P** indicating scores differences at day 1 and day 3, respectively, P*** indicating differences between the two study time points assessment

Table 3 Primary endpoint outcomes according to subject characteristics

	Willingness to repeat endoscopy in our facility			Willingness to recommend our facility		
	D1	D3	M3	D1	D3	M3
Overall	497 (99.2)	440 (98.2)	429 (97.5)	495 (98.8)	443 (98.9)	434 (98.6)
Sex, N (%)						
Male	266 (98.5)	237 (97.5)	232 (97.1)	265 (98.1)	240 (98.8)	235 (98.3)
Female	231 (100)	203 (99.0)	197 (98.0)	230 (99.6)	203 (99.0)	199 (99.0)
Age, N (%)						
<65	319 (99.1)	282 (97.9)	275 (97.5)	317 (98.4)	283 (98.3)	277 (98.2)
≥65	178 (99.4)	158 (98.8)	154 (97.5)	178 (99.4)	160 (100)	157 (99.4)
Previous experience, N (%)						
Yes	253 (100)	220 (98.2)	216 (98.2)	252 (99.6)	221 (98.7)	217 (98.6)
No	244 (98.4)	220 (98.2)	213 (96.8)	243 (98.0)	222 (99.1)	217 (98.6)
Examination, N (%)						
Colonoscopy	251 (98.8)	218 (98.2)	213 (96.8)	251 (98.8)	220 (99.1)	217 (98.6)
Gastroscopy	216 (99.5)	197 (98.0)	192 (98.0)	214 (98.6)	198 (98.5)	193 (98.5)
Both procedures	30 (100)	25 (100)	24 (100)	30 (100)	25 (100)	24 (100)
Type of procedure, N (%)						
Diagnostic	390 (99.2)	343 (98.3)	332 (97.1)	390 (99.2)	346 (99.1)	338 (98.8)
Therapeutic	107 (99.1)	97 (98.0)	97 (99.0)	105 (97.2)	97 (98.0)	96 (98.0)

Table 4 Pareto D1 and D3 analysis: items adding to more than 80% of the negative answers

Pareto D1			Pareto D3		
Item	Contribution (%)	Cumulative contribution (%)	Item	Contribution (%)	Cumulative contribution (%)
Q4	16.97	16.97	Q4	15.03	15.03
Q13	13.86	30.83	Q26	12.14	27.17
Q37	11.91	42.74	Q37	10.55	37.72
Q3	9.46	52.20	Q3	8.38	46.10
Q39	8.97	61.17	Q39	7.95	54.05
Q7	7.51	68.68	Q7	6.64	60.69
Q14	7.34	76.02	Q38	5.21	65.90
Q38	5.87	81.89	Q27	4.62	70.52
			Q28	4.19	74.71
			Q31	3.61	78.32
			Q5	3.47	81.79

Answers to 8 and to 11 of the 19 items accounted for the 80% of the 613 and 692 negative responses in the Pareto D1 and Pareto D3 analysis, respectively. In Pareto D1 data set (Fig. 1), responses to three pre-procedure, two procedure and three post-procedure questionnaire items accounted for the 34%, 21% and 26.9% of the negative answers, respectively. Regarding Pareto D3 data set (Fig. 2), responses to four pre-procedure, two procedure and five post-procedure questionnaire items accounted for the 33.5%, 16.7% and 31.6% of the negative responses, respectively. Eight of the items that received the majority of the negative answers were common in the two analyses: process to get an appointment, waiting time until the day and on the day of the examination, discomfort during and after the procedure, time needed to obtain the pathology report, explanation of the pathology findings by the endoscopist and overall management of patient problems. Among them, waiting time until the appointment day and procedure discomfort ranked first and second in both analyses. It is noteworthy that there was a significant correlation of the overall cumulative patient satisfaction score with both procedural and post-procedural discomfort satisfaction score at D1 ($r=0.74$; $P<0.001$ and $r=0.68$; $P<0.001$, respectively) and D3 ($r=0.63$; $P<0.001$ and $r=0.45$; $P<0.001$, respectively) assessments. Finally, the type of examination - diagnostic vs. therapeutic - did not affect ($P>0.11$) the contribution of any of the aforementioned items to the amount of negative provided responses.

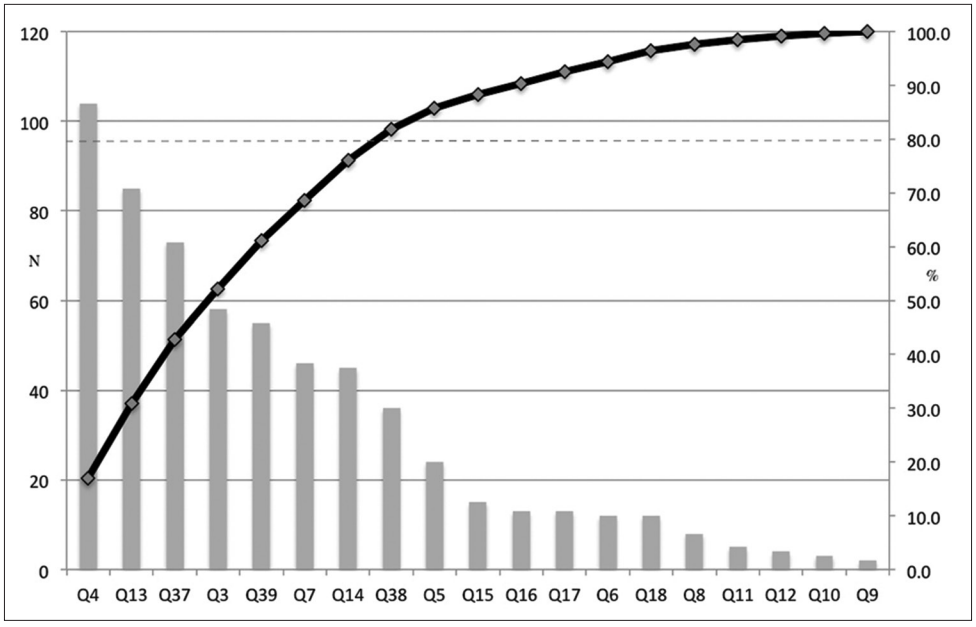

Figure 1 Group A Pareto analysis. Secondary axis indicates cumulative percentage of unfavorable answers

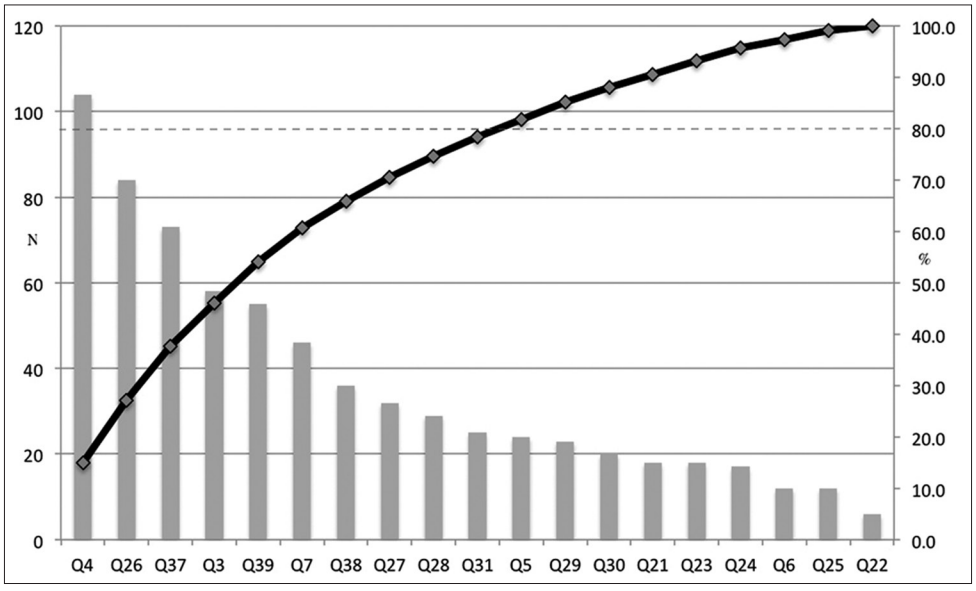

Figure 2 Group B Pareto analysis. Secondary axis indicates cumulative percentage of unfavorable answers

Late adverse events

Patients were asked to report late endoscopy adverse events three days and three months post-procedure. 55 and 56 patients who underwent gastroscopy, as well as 38 and 37 participants who underwent colonoscopy reported an adverse event at D3 and M3, respectively. Among patients who underwent both procedures on the same day, four reported adverse events at the two assessments, respectively. Discomfort was the most prevalent adverse event at both service assessments. There were no reports of serious adverse events at any survey time point.

Discussion

Our survey evaluated for the first time the long-term patient satisfaction after endoscopy. Although colleagues have published data on patient satisfaction right after endoscopy until four weeks later [4-7,9,13-20], we herein present results measuring patient satisfaction three months post-procedure. This time point was arbitrarily selected since it was considered far enough from the procedure to secure accurate and bias -patient to physician interaction, fear of the patient

to provide answers that might impact problem resolution, etc.- free responses. At this time point, more than 98% of the participants were willing to undergo the same examination by the same doctor in our facility and more than 97% of them would pleasantly recommend our facility to friends and family members. These high satisfaction scores did not differ from those recorded during the earlier two survey assessments, providing evidence that once high level of satisfaction has been achieved, it is maintained long-term.

To identify issues requiring improvement of our endoscopy service we used Pareto analysis, a statistical method primary used in business statistics; also known as the 80/20 rule - 20% of the causes are responsible for 80% of the burden - that helps recognize the main issues responsible for severe deficiencies. Pareto analysis has been used to identify issues requiring improvement in endoscopy services [4,5,9]. The analysis revealed waiting time until the appointment and waiting time at the day of examination [4,5,9], adequacy of explanation provide by the endoscopist [5], discomfort during the procedure [9], and comfort during bowel preparation [4] as major issues requiring improvement. Accordingly in our survey, long waiting period until the examination, long waiting time during the examination day and the appointment process itself, contributed significantly to the total percentage of unfavorable answers. Absence of advanced appointment computerization system service and overloaded lists leading to lack of vital time for patient-physician communication might explain the above findings.

Interestingly, 14.5% of the participants were not satisfied with their overall health problem management, three months post-procedurally. This might be explained, at least partially, by long delays until obtaining the final pathology report. However, multiple other factors might contribute to this complaint, such as, severity of the underlying disease, patient perspectives, need for multidisciplinary disease management, deficiencies of other Hospital disciplines to provide adequate service, etc.

Procedure- and post-procedure-related discomfort was the only procedural issue requiring improvement. Moreover, there was correlation of the overall cumulative satisfaction score with procedural and post-procedural discomfort satisfactions scores both at D1 and D3 assessments, respectively. This is in accordance with a previous report that discomfort, during or after the procedure, influences patient satisfaction [20].

The lower discomfort-associated satisfaction scores could be attributed to the on demand sedation administration policy in our facility. During colonoscopies a predefined optimized sedation schedule is used [10], while the majority of patients undergo unsedated gastroscopy, a safe and time-saving practice [21]. That might explain the lower satisfaction scores with upper gastrointestinal endoscopy.

In our survey, no predictor of high satisfaction score was revealed in multivariate analysis, although two patient and procedure characteristics were associated with higher satisfaction score immediately after endoscopy in the univariate analysis. Overall, D1 and D3 assessments satisfaction scores were high. Nevertheless, a small, albeit significant, difference was detected in favor of D1. Younger patients, patients without previous endoscopy experience, patients undergoing upper gastrointestinal endoscopy and patients undergoing diagnostic examinations had higher scores right after endoscopy in comparison with the D3 assessment. There is no similar finding in the literature and it is difficult to explain it. Actually, the detected differences are very small and they have not affected our primary endpoint outcome. Ultimately, this finding might have low significance in clinical practice.

In our population abdominal discomfort was the most prevalent late adverse event after both gastroscopy (14%) and colonoscopy (13.8%) and these percentages remained unchanged three months later (13.6% and 12%, respectively). Of interest, Larsen *et al* [6] evaluated patient satisfaction and revealed occurrence of flatulence and abdominal pain at a similar rate (12%) in patients undergoing flexible sigmoidoscopy.

Different methods of interview to evaluate patient satisfaction have been described in the literature [4-7,9,13,15-23]. On-site, mail or phone back interviews are those mostly used. To avoid favor bias during the on-site interview [22], patients filled the questionnaire alone in privacy, when they had fully recovered from sedation (if administered), just before their discharge. For the following two assessments, we used phone back interviews instead of mail back, despite the evidence for medium response rates for both methods: Lin *et al* [18] reported a response rate of 62% via mail back questionnaires, whereas response rates for phone back interviews range from 60-73% [9,17]. Our survey's high follow-up response rate ranging from 87.8% (M3) to 89.4% (D3) is one of the advantages of our survey, the large number of participants compared to previous reports [2,4,7,17,21,23,24] being the second. These high response rates could be attributed to our strategy to call the study participants thrice before recording no response. Moreover, different population's baseline characteristics (age, educational level etc.), not assessed in our survey, could potentially explain these high response rates too.

Our study has several limitations. Firstly, it is a single-center study and therefore our results might not be applicable in other endoscopy facilities. Secondly, there is no globally accepted score or questionnaire to measure patient satisfaction after endoscopy. The widely used 9-mGHAA, though simultaneously criticized for deficits and unfeasibility, as well as other tests and scores have been used previously [15,16,25]. We used a combination of the 9-mGHAA questionnaire and the satisfaction questionnaire for outpatients provided by AGA Institute. The aim of this combination was to widen the range of factors related to patient satisfaction. It has been shown that factors not included in the 9-mGHAA questionnaire, like discomfort, contribute substantially in future compliance with endoscopy services [20] and our study underlined the correlation between discomfort and overall cumulative satisfaction scores. Thirdly, lack of sedation amount documentation is acknowledged as a study limitation. Precise data on the amount of sedation were not requested by the study protocol, since the aim of the study was to reveal potential deficiencies in our service. The implementation of a corrective action plan based on the results of the current study will assess

Summary Box

What is already known:

- Patient satisfaction is an important quality indicator that should be measured in all endoscopy services
- Different methods have been used to measure patient satisfaction right after endoscopy until one month post-procedure

What the new findings are:

- High level of endoscopy service-related patient satisfaction, measured using a specific questionnaire, is retained for long, once acquired
- Procedure-related discomfort and organizational issues affect negatively patient satisfaction the most
- The reported rate of late adverse events is low, up to three months post procedure

and evaluate a potential correlation of patient satisfaction and the amount of administrated sedation. Finally, we acknowledge the lack of formal validation of our questionnaire in Greek language and the arbitrarily allocation of satisfaction scores to favorable and unfavorable responses as study limitations. Therefore, a validated questionnaire is required to allow the comprehensive measurement of patients' endoscopy service satisfaction. This questionnaire could be adjusted locally to overcome facilities barriers. It remains to be examined whether the lately published British endoscopy satisfaction questionnaire [26] fulfills the aforementioned requirements.

In conclusion, the results of our survey provide evidence that high levels of patient satisfaction after endoscopy are retained long-term. The main factors negatively affecting satisfaction are procedure-related discomfort and facility's organizational issues.

Acknowledgment

Authors would like to acknowledge all stuff members of the Hepatogastroenterology Unit, Second Department of Internal Medicine and Research Institute at "ATTIKON" University General Hospital, as well as the Athens University Medical School pre-graduate students for their contribution to the survey.

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