

# Evaluation of Patient's Satisfaction using Propofol Sedation for Outpatient's Colonoscopy Clinics

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**ABSTRACT**—Background: Propofol is a sedative-hypnotic agent widely employed for colonoscopy not only by anesthesiologists but also by a growing number of non-anesthesiologists. 3 It provides a favorable patient experience and operator satisfaction while facilitating efficient patient throughput. The aim of this study was to evaluate patient satisfaction with propofol anesthesia for outpatient colonoscopies. Material and methods: conducted at Dar AL-Shefa, AL-Jala trauma hospital, Benghazi Specialized Hospital in Benghazi-Libya. A total of 50 patients from both genders. Data collection process was according questionnaire face to face interview with each patient, with a total of 12 question, The first part of questionnaire contains socio-demographic data of the participants, indication, medical history Second part: Related to Colonoscopy preparation (dose of sedation, vital signs, Third section: Patient satisfaction related questions. Statistical analysis was performed by using SPSS (Statistical Package for the Social Sciences). Results: shows substantially higher patient satisfaction, as majority (70%) of patients shows totally satisfaction of the procedure, also moderately satisfied (18%), slightly satisfied in (8%) and only (4%) regarding propofol anesthesia with bolus method. Conclusion: In conclusion this result shows that availability of propofol sedation facilitate higher compliance and acceptance for procedure to do it for another time if required. This study shows some limitation due shortage of time, cases, further more studies required to emphasize the result.

**Keywords:**Propofol;Colonoscopy; Patient Satisfaction; Anesthesia.

## I. INTRODUCTION

Colonoscopy is a common diagnostic and therapeutic tool for various colorectal diseases, such as polyps, tumors, and inflammation, as well as a primary screening test for colorectal cancer<sup>[1]</sup> In the United States, United Kingdom, and China, almost all colonoscopies are performed under sedation.<sup>[2]</sup>

The objectives of colonoscopy are to perform optimal mucosal inspection in a safe and effective manner. Patient sedation is key to this goal. Not all patients will require sedation during colonoscopy<sup>[3]</sup> but for a significant number, or for those requiring longer therapeutic procedures, sedation is necessary. The ideal sedative for colonoscopy relieves the patient's anxiety and discomfort, improves the ability to perform mucosal inspection and therapy, and reduces or eliminates the patient's memory of the procedure. Several of different sedatives and analgesics can be used to achieve appropriate levels of sedation at colonoscopy, ranging from conscious sedation with benzodiazepines and opioids to deep sedation with propofol and general anesthesia. Interestingly, neither the American nor the European guidelines addressing quality indicators for colonoscopy mention the type or amount of sedation that should be given at colonoscopy.<sup>[4],[5]</sup> Propofol-based sedation is widely employed for colonoscopy not only by anesthesiologists but also by a growing number of non-anesthesiologists.<sup>[5]</sup> It provides a favorable patient experience and operator satisfaction while facilitating efficient patient throughput. More than one-third of patients who underwent a colonoscopy with propofol sedation 3 experienced episodes of hypotension that reached a level and duration typically associated with adverse effects in surgical patients. Extended duration of propofol sedation and larger doses of propofol were associated with more sustained and more severe hypotension due to the vasodilatory effects of propofol.<sup>[6]</sup> Furthermore, the administration of bowel preparation and fasting will lead to relative hypovolemic status for patients planned for colonoscopy. Other factors such as age and comorbidity would also predispose patients to hypotension.

### 1.1 Propofol:

Propofol is a sedative-hypnotic agent that has been shown to have several advantages over conventional endoscopic sedation using a benzodiazepine and an opioid. Some of the advantages that have been shown with propofol include greater patient satisfaction<sup>[7]</sup> higher physician satisfaction<sup>[8]</sup> rapid induction of sedation<sup>[7],[9],[10]</sup> faster patient

recovery<sup>[7],[9],[10]</sup> shorter insertion time for colonoscopy,<sup>[10]</sup> quicker discharge from endoscopy, <sup>[7],[9]</sup> greater efficiency in the endoscopy suite<sup>[11]</sup> and all with no detectable cognitive impairment at the time of discharge.<sup>[7],[9],[12]</sup> The advantages of propofol over conventional endoscopic sedation have leads to its expanding use in the endoscopy suite<sup>[8]</sup> A low-dose propofol protocol for propofol administration was developed by Cohen et al to preserve moderate sedation. Cohen et al <sup>[13]</sup> showed that moderate sedation is possible when propofol is combined with an opioid and a benzodiazepine<sup>[14]</sup> Episodes of deep sedation were infrequent and transient, resolving within 2 minutes without incident. Patient satisfaction was high, with no detectable cognitive deficits detected at the time of discharge. In addition, patient satisfaction appears to be greater for those undergoing a colonoscopy who receive propofol sedation<sup>[15]</sup> and this finding may improve patient compliance and adherence to colorectal cancer-screening and -surveillance programs. The level of sedation under propofol-mediated sedation increases in a dose-dependent manner, and patients are generally titrated to an adequate level of sedation as required during the procedure<sup>[16]</sup> which may improve the efficiency and quality of the procedure by providing the endoscopist with optimal conditions for a thorough visualization, while eliminating any distraction due to an uncomfortable patient.

## 1.2 Aim of the study:

The aim of this study was to evaluate regarding patient satisfaction with propofol anesthesia for outpatient colonoscopies in Benghazi-Libya.

## II. METHODOLOGY

### 2.1 Ethical approval:

The study was approved by Qurina University-Faculty of medical sciences, anesthesia department, Dar AL-Shefa, AL-Jala trauma hospital, Benghazi Specialized Hospital. All procedures performed in studies involving human participants were permissioned and accordance with the ethical standards.

### 2.2 Study Design:

It's an analytical prospective, randomized study by using questionnaire based upon similar questionnaires from previous studies and was conducted at Dar AL-Shefa, AL-Jala trauma hospital, Benghazi Specialized Hospital in Benghazi-Libya from fifteenth of august to the end of November 2024.

### 2.3 Patients and data collection:

A total of 50 patients from both genders enrolled in this study, who attended outpatient clinic in hospitals was mentioned before to book an appointment after diagnoses. Highly risk Cardiac and pulmonary disease patients were excluded from the study. Colonoscopy was performed in the lateral decubitus position. Data collection process was according questionnaire face to face interview (translated to Arabic) with each patient before and after completion of the procedure and be vitally stable.

The questionnaire contains a total of 12 question, as the survey consist of three parts: The first part contains socio-demographic data of the participants (age, gender) indication, medical history (chronic disease). Second part: Related to Colonoscopy preparation (dose of sedation, vital signs (spo2, heart rate, BP), Third section: Patient satisfaction related questions (side effect post colonoscopy whether there is pain, diarrhea, bleeding, hypotension) satisfaction regarding procedure with multiple choice answers, Finding of quality of bowel preparation adequate or an inadequate.

### 2.4 Statistical Analysis:

In this study statistical analysis was performed by using SPSS (Statistical Package for the Social Sciences) Soft-Ware package for windows version 28. Descriptive statistics were presented categorical variables were expressed as frequencies and, percentages. All data was represented in graphical and tabular form. Chi square test was using to assess relationship between satisfaction regarding anesthesia and side effect post colonoscopy.

## III. RESULTS AND DISCUSSIONS

### 3.1 Results:

**Table (3.1.1):** This table shows the hospitals attended by patients for colonoscopy, 60% of them attend AL-Jala trauma hospital for colonoscopy, while 22% of the patients attend Dar AL-Shefa, and only 18% attend Benghazi Specialized Hospital.

**Table (3.1.1): Hospitals attend it.**

Hospitals	Frequency	Percent
Dar AL-Shefa	11	22%
AL-Jala trauma hospital	30	60%
Benghazi Specialized Hospital	9	18%
Total	50	%100

**Table (3.1.2):** Second ages of participants as nearly half of them 44% fell in over (50%), followed by that fell in the age bracket of (35-49) with 26%, 20 % of them fell between (25-34), and last 8% of them range (18-24).

Table (3.1.2): Age of participants.

Age	Frequency	Percent
18-24	4	8%
25-34	10	20%
35 - 49	13	26%
Over 50	23	46%
Total	50	100%

**Table (3.1.3):** Third the gender, as there was a total of 29 (58%) male patients enrolled in the study, and only 21 (42%) of them were female.

Table (3.1.3): Gender of patient's frequency and percent.

Gender	Frequency	Percent
Male	29	58 %
Female	21	42%
Total	50	100%

**Table (3.1.4):** As noted bellow different reasons for colonoscopy for each patient as the reason for (26%) of them was finding in diagnostic imaging, while constipation in (24%) of them, chronic pain in (18%), anemia in (14%), polyp in (12%), diarrhea only in (6%) of participants.

Table (3.1.4): Indication of Colonoscopy frequency and percent.

Indication of Colonoscopy	Frequency	Percent
Chronic pain	9	18%
Diarrhea	3	6%
Constipation	12	24 %
Anemia	7	14%
Polyp	6	12%
Finding in Diagnostic Imaging	13	26 %
Total	50	100%

**Figure (3.1.1):** As noted below (26%) of patients has history with diabetes mellitus, (24%) of them had history with Crohn's disease, (22%) hypertension, (14%) hypothyroidism, (8%) hyperthyroidism, only (6%) with irritable bowel syndrome.

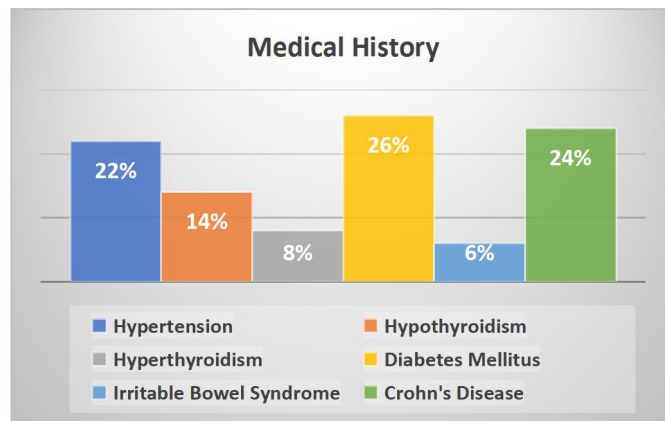


Figure (3.1.1): Medical history curve.

**Table (3.1.5):** As seen bellow the dose of propofol (2mg /kg/min) was given to patients in bolus, as required. as initial dose over 5-10 seconds, the second dose over 50-70 seconds, and found when the patient was still feeling discomfort during the procedure 10 to 20mg dose was also delivered.

Table (3.1.5): Dose of propofol frequency and percent.

Dose of propofol	Frequency	percent
2mg /kg/min (Bolus) (30>200mg)	50	100%
Total	50	100%

**Table (3.1.6):** As noted bellow nearly half the patients have low blood pressure reading 23 (46%), while 21 (42%) of them had normal reading, and only 6 (12%) had high blood pressure reading, for pulse rate 27 (54%) of the patients have sinus rhythm (normal heart rate), while 17 (34%) of them have bradycardia, and only 6 (12%) had tachycardia. Followed by Spo2 reading as most of the patients had 100% saturation reading while only 12 (24%) had reading between (89%-99%). Low reading blood pressure and heart rate reading could be due pre-preparation of colonoscopy (clean prep).

**Table (3.1.6): Vital Signs prior Colonoscopy.**

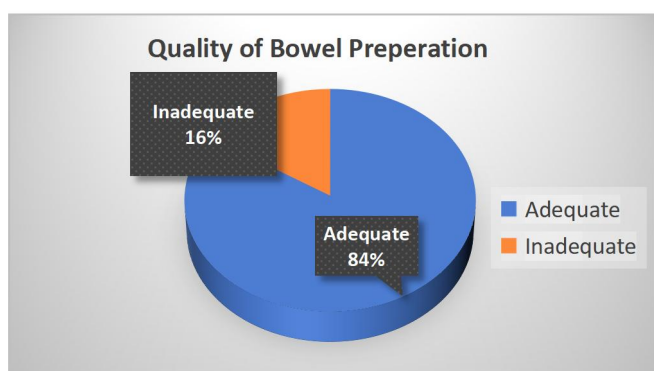
Vital Sign	Frequency	Percent
<b>Blood Pressure</b>		
Low Blood Pressure	23	46%
High Blood Pressure	6	12%
Normal Blood Pressure	21	42%
<b>Total</b>	50	100%
<b>Pulse Rate</b>		
Bradycardia	17	34%
Tachycardia	6	12%
Sinus Rhythm	27	54%
<b>Total</b>	50	100%
<b>Spo2</b>		
99-98%	12	24%
100%	88	76%
<b>Total</b>	50	100%

**Table (3.1.7):** Diarrhea and hypotension are the most common side effect post colonoscopy in (46%) patients, followed by hypotension (22%), then headache (18%), and lastly (vomiting and dizziness) and (pain and bleeding) (10%,4%) respectively.

**Table (3.1.7): Side Effect Post Colonoscopy frequency and percent.**

Side Effect Post Colonoscopy	Frequency	Percent
Pain, bleeding	2	4%
Diarrhea And Hypotension	23	46%
Vomiting and dizziness	5	10%
Hypotension	11	22%
Headache	9	18%
<b>Total</b>	50	100%

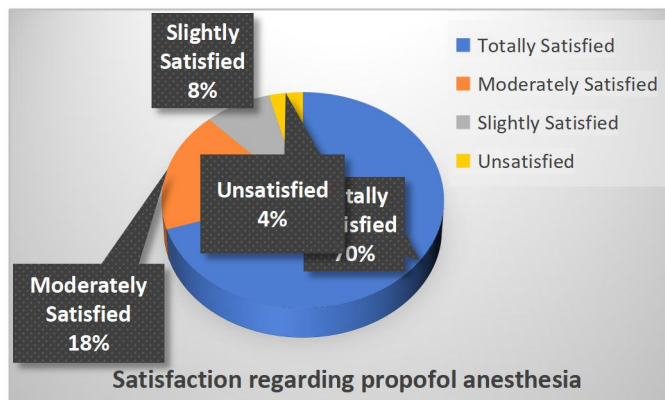
**Figure (3.1.2):** Was showing the Bowel preparation was adequate in majority of patients, and inadequate in only 16% of them.



**Figure (4.1.2): Quality of Bowel Preparation curve.**

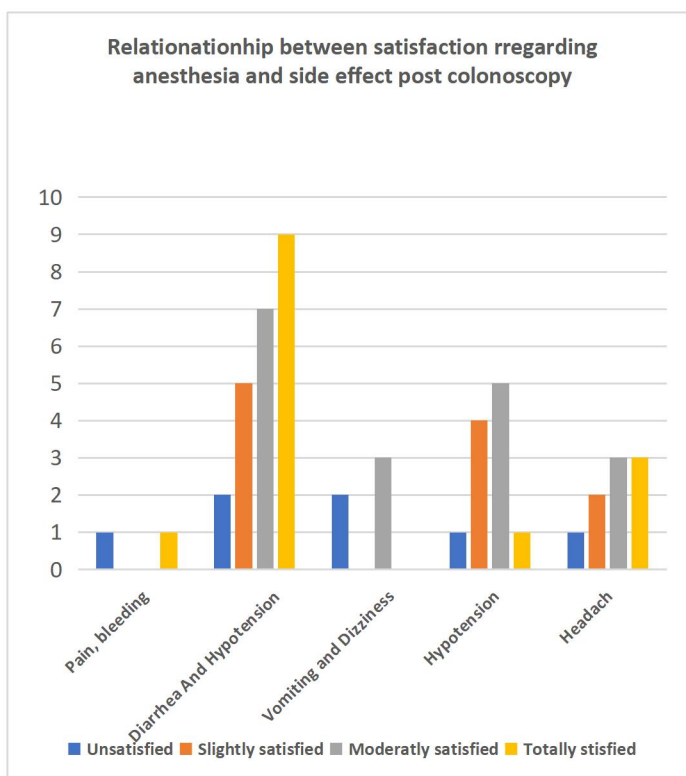
**Figure (3.1.3):** As noted bellow majority of patients were totally satisfied (70%) with propofol sedation during

procedure, while (18%) moderately satisfied, (8%) slightly satisfied, and only (4%) of patients found unsatisfied.



**Figure (3.1.3): Satisfaction regarding propofol anesthesia.**

#### • Statistical Results:



**Figure (3.1.4): Relationship between satisfaction regarding anesthesia and side effect post colonoscopy.**

**Table (3.1.8), Figure (3.1.4):** This result showing the association between propofol satisfaction and side effect post colonoscopy in the study, as ( $P = 0.31$ ) which is higher the probability value (0.05) which indicates the week relationship between it, statistically not significant. As difficult to confirm



that the side effect post colonoscopy due to propofol alone as it could be due colonoscopy preparations.

**Table (3.1.8): Chi result (p value) between satisfaction regarding propofol anesthesia and side effect post colonoscopy.**

Chi-Square Tests	
Pearson Chi-Square P value	0.31

### 3.2 Discussions

Propofol-based sedation is widely employed for colonoscopy not only by anesthesiologists but also by a growing number of non-anesthesiologists. [2] It provides a favorable patient experience and operator satisfaction while facilitating efficient patient throughput. Our study clearly shows substantially higher patient satisfaction, as majority (70%) of patients shows totally satisfaction of the procedure, also moderately satisfied (18%), slightly satisfied in (8%) and only (4%) regarding propofol anesthesia with bolus method. The unsatisfied result regarding procedure could be due to reoccurrence of discomfort, pain which required another bolus dose.

Similarly on the same type of anesthesia in a study by Casper S. *et al* [18] shows substantially higher patient satisfaction among patients receiving deep sedation with propofol, this study also shows some difference as used in ours a bolus method for reduction of discomfort of colonoscopy.

Sedation with propofol in hour study shows less pain, also in study Budet JS *et al*, [19] as sedation cannot improve bowel preparation and may possibly worsen logistics because of extended recovery, but it can reduce the fear of pain, pain during colonoscopy, embarrassment, and increase the willingness to repeat endoscopies. [19]

A study by (Early DS *et al* and Cohen LB *et al*) showed that balanced propofol sedation (use of propofol in addition to (Benzodiazepine and Opioid) did not improve quality indicators compared to propofol monotherapy for colonoscopy. [20][13]

### IV. CONCLUSION

In conclusion, patients with favor sedation with propofol over non-sedation during colonoscopy. Our results shows that availability of propofol sedation facilitate higher compliance and acceptance for colonoscopy for another time if required. This study shows some limitation due shortage of time, cases further more studies required to emphasize the result.

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### REFERENCES

1. Chen C, Stock C, Hoffmeister M, *et al*. **Optimalage for screening colonoscopy: a modeling study.** *Gastrointest Endosc* 2019; 89(5): 1017.e12–1025.e12.
2. Abu Baker F, Mari A, Aamarney K, *et al*. **Propofol sedation in colonoscopy: from satisfied patients to improved quality indicators.** *Clin Exp Gastroenterol* 2019; 12: 105–110.
3. Ladas SD. **Factors predicting the possibility of conducting colonoscopy without sedation.** *Endoscopy* 2000; 32:688-92.
4. Rex DK, Schoenfeld PS, Cohen J, *et al*. **Quality indicators for colonoscopy.** *Am J Gastroenterol* 2015; 110:72-90.
5. Kaminski MF, Thomas-Gibson S, Bugajski M, *et al*. **Performance measures for lower gastrointestinal endoscopy: a European Society of Gastrointestinal Endoscopy (ESGE) quality improvement initiative.** *United European Gastroenterol.J* 2017;5:309-34.
6. Horiuchi A, Nakayama Y, Kajiyama M, *et al*. **Safety and effectiveness of propofol sedation during and after outpatient colonoscopy.** *World J Gastroenterol* 2012; 18(26): 3420–3425.
7. Sneyd JR, Absalom AR, Barends CRM, *et al*. **Hypotension during propofol sedation for colonoscopy: a retrospective exploratory analysis and meta-analysis.** *Br J Anaesth* 2022; 128(4): 610–622.
8. Sipe BW, Rex DK, Latinovich D, *et al*. **Propofol versus midazolam/meperidine for outpatient colonoscopy: administration by nurses supervised by endoscopists.** *Gastrointest Endosc* 2002; 55:815– 825.
9. Cohen LB, Wecsler JS, Gaetano JN, *et al*. **Endoscopic Sedation in the United States: results from a nationwide survey.** *Am J Gastroenterol* 2009-74.–101:967.
10. Ulmer BJ, Hansen JJ, Overley CA, *et al*. **Propofol versus midazolam/fentanyl for outpatient colonoscopy: administration by nurses supervised by endoscopists.** *Clin Gastroenterol Hepatol* 2003..432–1:425
11. Hansen JJ, Ulmer BJ, Rex DK. **Technical performance of colonoscopy in patients sedated with nurse-administered propofol.** *Am J Gastroenterol* 2004; 99:52–56.

12. Zamir S, Rex DK. **An initial investigation of efficiency in endoscopy delivery.** *Am J Gastroenterol* 2002; 97:1968–1972.
13. Cohen LB, Hightower CD, Wood DA, *et al.* **Moderate level sedation during endoscopy: a prospective study using low-dose propofol, meperidine/fentanyl, and midazolam.** *Gastrointest Endosc* 2004;803–59:795.
14. Cohen LB, Dubovsky AN, Aisenberg J, *et al.* **Propofol for endoscopic sedation: a protocol for safe and effective administration by the gastroenterologist.** *Gastrointest Endosc* 2003; 58:725– 732.
15. Padmanabhan A, Frangopoulos C, Shaffer LET. **Patient satisfaction with propofol for outpatient colonoscopy: a prospective, randomized, double-blind study.** *Dis Colon Rectum.* 2017;60(10):1102.
16. Ramsay MAE, Newman KB, Jacobson RM, *et al.* **Sedation levels during propofol administration for outpatient colonoscopies.** *Proc.* 2014;27(1):12–15.
17. Padmanabhan, Anantha *et al.* **Patient Satisfaction with Propofol for Outpatient Colonoscopy: A Prospective, Randomized, Double-Blind Study.** *Diseases of the Colon & Rectum*, Volume 60, Number 10, October 2017, pp. 1102-1108(7).
18. Casper S, Jeppe T. *et al.* **Patient Satisfaction of Propofol Versus Midazolam and Fentanyl Sedation During Colonoscopy in Inflammatory Bowel Disease.** *Clinical Gastroenterology and Hepatology* 2022; 20:559–568.
19. Budet JS, Aguirre-Jaime A. **The sedation increases the acceptance of repeat colonoscopies.** *Eur J Gastroenterol Hepatol* 2012; 24:775–780.
20. Early DS, Lightdale JR, Vargo JJ, *et al.* **Guidelines for sedation and anesthesia in GI endoscopy.** *Gastrointest Endosc.* 2018;87(2):327–337.