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THE EFFECT OF MODERATE VERSUS DEEP SEDATION ON THE SATISFACTION AND LENGTH OF STAY OF PATIENTS UNDERGOING COLONOSCOPY IN A LEBANESE SPECIALIZED ENDOSCOPY CENTER

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THE EFFECT OF MODERATE VERSUS DEEP SEDATION ON THE SATISFACTION AND LENGTH OF STAY OF PATIENTS UNDERGOING COLONOSCOPY IN A LEBANESE SPECIALIZED ENDOSCOPY CENTER

Abstract

Colonoscopy is one of the most common screening procedure to detect colorectal cancer. Sedation during colonoscopy decreases anxiety, discomfort, minimizes risks, and promotes the overall satisfaction of the patient. It's a challenge for nurses to adopt a sedation regimen taking into consideration traditional and modern techniques and methods. Purpose: To compare moderate and deep sedation effects on satisfaction, length of stay, and overall experience of patients undergoing colonoscopy. Methods: A quasi-experimental research was conducted among 149 patients who responded to the Iowa Satisfaction with Anesthesia Scale after been consented pre-procedure. Results: Statistically significant differences were demonstrated for almost most items of Iowa satisfaction with the anesthesia scale, in addition to the clear difference between the post-procedure stay duration and time to have had their vitals baselined again. Conclusion: Deep sedation using Propofol was much more effective in enhancing patient satisfaction and reducing the length of stay and procedure duration substantially, thus contributing to a higher quality of care and improved performance of the endoscopy units.

Keywords

Sedation; Satisfaction; Length of Stay; Colonoscopy.

1. INTRODUCTION

Colorectal cancer is a leading cause of cancer deaths worldwide, where it is found to be the third most commonly diagnosed cancer and the third leading cause of cancer death in both men and women in the US (Siegel et al., 2016). Screening as a definition is the application of tests or procedures to detect disease early in asymptomatic people (Haggar et al., 2009). Moreover, the extent of screening procedures to detect, prevent, and increase public awareness for early screening is becoming of a high level of priority and importance worldwide. Screening for colorectal cancer has substantially contributed to the downward trends in colorectal cancer incidence and mortality over the last 2 decades. The endoscopic examination continues to be the gold standard for examination of the colonic mucosa and upper gastrointestinal tract (Loftus et al., 2013).

Colonoscopy is generally a safe procedure and, fortunately, complications are rare. The most serious risk with colonoscopy is the perforation of the colon. To start with achieving maximal, exceptional, and ultimate patient satisfaction scores post colonoscopy procedures can be illustrated and affected by pain. In other words, pain can be a result of the physician inflating the colon to detect any growth on colon mucosa or polyps. Painful colonoscopy is one significant factor for patients not performing the screening procedure. Thus, most patients prefer the use of sedation and analgesia during colonoscopy (Brotons et al., 2019). The use of these sedatives can improve the performance of colonoscopy and enhance colonoscopy completion and colonic polyp detection rates (Baker et al., 2019).

Traditionally, sedation during colonoscopy has been provided by the combination of a narcotic and a benzodiazepine. In recent years Propofol (di-isopropyl phenol), as a deep sedative, has increasingly been utilized as an alternative method of sedation in endoscopy suites. It was initially introduced in 1989 and has since then been widely used in critical care units and emergency departments for providing sedation (Pace & Borgaonkar, 2018). It has been showing in a large case series that trained nurses and endoscopists can administer Propofol safely for colonoscopy procedures (Thirumurthi et al., 2017).

The American Society of Gastrointestinal Endoscopy has included patient satisfaction as an important indicator in all quality assurance programs for endoscopy. On another note, sedation during colonoscopy has been shown to reduce anxiety and fear associated with endoscopic procedures and improves patient safety, satisfaction, and acceptability of future procedures. Different sedation regimens are being used globally and researchers are conducting studies to better assess their effectiveness at different levels. Some countries are still using traditional sedatives and others are using new trends such as Propofol. In the targeted Lebanese colonoscopy center, it remains very controversial to use Propofol as the regular or main sedative for colonoscopy. For a long time, physicians hesitated to use Propofol for procedural sedation and many doctors were against its use due to many reasons not limited to knowledge, proper training, and fear of complications. Over time there is more support for its use in colonoscopy and it's becoming a trend worldwide to use it outside operating rooms. While there is much evidence to support its use, and literature became saturated with its advantages, yet there remain many concerns about its consequences on the level of satisfaction and length of stay and whether the reported advantages would be applicable to the current setting in this study. Critically examining these two methods of sedation in Lebanon would be immensely helpful to support either adopting or regulating the use of this new method in colposcopy procedures. The literature demonstrates a gap regarding the definite importance of Propofol over traditionally used sedation agents, especially in Arab countries. It is crucial for the researcher to conduct this study and add to the current knowledge on the topic thus contributing to improving the quality of holistic care provided to the patients and their families in Lebanon and the Arab region.

2. METHODOLOGY

2.1 Research Design

This study adopted a quantitative approach using a quasi-experiment design to study the effect of the deep sedative, Propofol, on patient satisfaction and their length of stay in colonoscopy unit. This research design specifically was employed to tackle various specific

objectives namely; measure the level of patients' satisfaction undergoing colonoscopy with traditional sedation (Midazolam & Fentanyl), explore the effect of deep sedative (Propofol) on patients' satisfaction post colonoscopy, compare the length of stay in recovery room of patients who went colonoscopy using traditional methods verses those who undertake deep sedatives, and compare the level of satisfaction of patients who went colonoscopy using traditional methods verses those who undertake deep sedatives. In regards to baseline (pre-intervention) attributes, quasi-experimental designs establish a comparison group that is as close to the treatment group as feasible. The results that would have occurred if the program/policy had not been adopted are captured in the comparison group (i.e., the counterfactual). As a result, any difference in results between the intervention and comparison groups may be attributed to the program or policy applied (Cook, 2015).

2.2. Sample

A convenient sample of 149 adult patients of both sexes who are admitted to the previously mentioned unit who fits the inclusion criteria are included in the study. Group A received Propofol for sedation and a group B receiving the traditional sedatives: fentanyl/dormicum. The inclusion criteria for this study was specifically set to include outpatients undergoing a colonoscopy procedure between the ages of 16 and 65. Any patient below the age of 18 or older than 65, in addition to patients under opioids, narcotics, MAO inhibitors or benzodiazepines chronic use, patients with history of alcohol abuse, history of hypersensitivity to Propofol, fentanyl, or midazolam or any contraindication, history of colonic or rectal resection, patients with neurologic deficit, noncompliance with bowel regimen, and pregnant patients were excluded from the study.

2.3. Setting

This study was conducted in the endoscopy and Bronchoscopy unit at American University of Beirut Medical Center (AUBMC). The American University of Beirut Medical Center's (AUBMC) Endoscopy and Bronchoscopy Unit (EBU) is a cutting-edge facility committed to providing high-quality gastrointestinal, pancreaticobiliary, and pulmonary endoscopy treatments. The EBU was established almost over 20 years ago and has grown significantly in the last five years; with big growth plans in place at all tiers. Five completely kitted endoscopy rooms, an expansive waiting zone, devoted client preparation and recovery rooms, dictation room, storage facilities, employees sitting room, patient counseling space, janitor space, meeting room, isolation room, scope disinfecting and handling room with advanced washers, patient and staff restrooms (wheelchair accessible), clean/dirty utility rooms, and scope storage make up the unit. It provides a prompt, courteous, and efficient check-in in a big and pleasant reception room, one-stop service (insurance approval, invoicing, and payment), and patient preparation, monitoring, and recuperation under the supervision of highly qualified healthcare experts. The EBU design parameters, circulation, and clinical practice standards, which were refined with the goal of delivering outstanding patient care and safety, were endorsed and authorized by the AUBMC and thus was awarded a Joint Commission International accreditation.

2.4. Procedure

The department heads/chairpersons of the listed organizations requested to submit an electronic mail invitation to prospective respondents using contact details from their internal records. While electronic mail details were not given to the investigator, Qualtrics gathered and classify each participant's answers to represent NRP participation or non-participation. All who accepted the invitation filled out an electronic consent form, the survey, directions and contact details for the investigator if they have any inquiries. The survey was forwarded to 231 students, where 203 have responded, thus resulting in a response rate of. 87.7%. Reasons for not participating in the study were associated with personal circumstances making the graduates not able to take part. Data collection extended over the period of two months (May 2021-July 2021).

2.5. Instrumentation

Sociodemographic questionnaire

The gender, age, and kind of sedation utilized were all recorded on a demographic data questionnaire.

Iowa Satisfaction with Anesthesia Scale (ISAS)

This is a 6 item version of the scale, where each statement in the survey describes a feeling that the patient may have had during anesthesia. This questionnaire is adopted from Dexter et al. (1997). For each item an answer shall be chosen that best shows how well the statement describes how the patient felt. If the feeling does describe how patient felt, it shall be marked with an agree answer. If the feeling does not describe how the patient felt it shall be marked with a disagree answer. There are no right or wrong answers, only one answer for each item. A 5 point Likert scale ranging from strongly disagree "1" to strongly agree "5" was adopted. Baroudi et al. (2010) has tested its fitness for use and shown a Cronbach alpha of 0.72, while the Cronbach alpha in this study was 0.84 which proves internal consistency.

2.6. Data analysis

The statistical data evaluation was completed using the Statistical Package for Social Science (SPSS) version 28 program, which was utilized to insert all of the data into a database. Because it was statistically significant, a 0.05 P-value was used. The data was summarized using descriptive statistics such as frequencies, percentages, means, and standard deviations. An independent t-test was used to examine differences between study groups, and bivariate correlational analysis was used to check if there was a relationship between the study parameters.

2.7.Ethical Considerations

The hospital's Research and Ethics Committee approved the researchers' request (SBS-2019-0088). All ethical concerns were addressed in accordance with the principles and standards of the international Declaration of Helsinki, in which patients were informed of all research information prior to enrollment and were not coerced to participate. Patients who didn't take part faced no disadvantages, and informed consent was acquired.

3. RESULTS

3.1. Participants' characteristics

The study included one hundred and forty-nine participants (N=149) where they were all undergoing colonoscopy and bronchoscopy unit (EBU) and have met the stated inclusion criteria thus been chosen to take part in this study. The descriptive analysis of the socio-demographic data have shown that 66 (44.3%) of the patients were females while 83 (55.7%) of them were males. In addition, 17 patients (11.4%) were between 14 and 18 years of age , 56 (37.6 %) were between 18 and 40 years , 66 (44.3%) were between 40 and 60 years , 9 (6.0%) between 60 and 80 years , and 1 participant (0.7%) aged more than 80 years. Moreover 78 (52%) of participants received deep sedation (Propofol) while 71 (47.7%) of them received moderate sedation (midazolam/fentanyl) thus the sample was almost equally distributed between the two modalities of sedation used in this study (Table 1).

Table 1. Sociodemographic data

		N	%
Gender	Male	83	55.7
	Female	66	44.3
Age	14-18 years	17	11.4
	18-40 years	56	37.6
	40-60 years	66	44.3
	6-080 years	9	6.0
	> 80 years	1	0.7
Type of Sedation	Deep Sedation	78	52.3
	Moderate Sedation	71	47.7

3.2. Procedure duration and length of stay

Descriptive analysis showed that the mean length of stay duration of the patients undergoing colonoscopy using deep sedation was 24 minutes and 5 seconds, where the minimum was 14 minutes 59 seconds while the maximum length of stay was 36 minutes. In addition, the analysis showed that the procedure took on average a duration of 24 minutes and 37 seconds where the minimum duration was 9 minutes 59 seconds and the maximum recorded duration was 36 minutes. On the other hand, the analysis showed that the mean length of stay duration of the patients undergoing colonoscopy using moderate sedation was 35 minutes and 4 seconds, where the minimum was 18 minutes 59 seconds while the maximum length of stay was 55 minutes and 59 seconds. In addition, the analysis showed that the procedure took on average a duration of 32 minutes and 28 seconds where the minimum duration was 19 minutes 59 seconds and the maximum recorded duration was 1 hour and 23 minutes (Table 2).

Table 2. Procedure duration and length of stay

	Min	Max	Mean
Deep sedation			
Length of Stay	0:14:59.99	0:36:00.00	0:24:05.38
Procedure Duration	0:09:59.99	0:36:00.00	0:24:37.69
Moderate Sedation			
Length of Stay	0:18:59.99	0:55:59.99	0:35:04.23
Procedure Duration	0:19:59.99	1:23:00.00	0:32:28.73

3.3. Difference in patient satisfaction according to type of sedation

An Independent T-test was carried out to determine if there is a difference between moderate sedation and deep sedation on the level of patient satisfaction. The results showed that there is a highly significant difference between moderate and deep sedation on the level of all elements of satisfaction namely, “I would want to have the same anesthetic again” (P=0.00), “I threw up or felt like throwing up” (P=0.04), “I felt relaxed” (P=0.00), “I felt pain during procedure” (P=0.00), “I felt safe” (P=0.00), and “I itched” (P=0.04), where the deep sedation group scored higher means than moderate sedation group (Table 3).

Table 3. Difference in patient satisfaction according to type of sedation

		Mean	SD	t	P-value
I would want to have the same anesthetic again	Moderate Sedation	0.68	2.18	-8.07	**0.00**
	Deep Sedation	2.79	0.75	-7.78	
I threw up or felt like throwing up	Moderate Sedation	2.77	0.94	-1.11	**0.04**
	Deep Sedation	2.92	0.68	-1.09	
I felt relaxed	Moderate Sedation	1.39	1.86	-7.42	**0.00**
	Deep Sedation	2.96	0.19	-7.08	
I felt pain during procedure	Moderate Sedation	-0.68	2.44	-11.21	**0.00**
	Deep Sedation	2.76	1.11	-10.87	
I felt safe	Moderate Sedation	2.21	1.34	-5.09	**0.00**
	Deep Sedation	2.99	0.11	-4.86	
I itched	Moderate Sedation	2.99	0.12	-1.05	**0.04**
	Deep Sedation	3	0.00	-1.00	

3.4. Difference in patient length and procedure duration of stay according to type of sedation

An Independent T-test was carried out to determine if there is a difference between moderate sedation and deep sedation on the level of patient length and procedure duration. The results showed that there is a highly significant difference between moderate and deep sedation on the level of both length of stay (P=0.01), and procedure duration (P=0.00), where the deep sedation group had a shorter procedure duration and length of stay (Table 4).

Table 4. Difference in patient length and procedure duration of stay according to type of sedation

		Mean	SD	t	P-value
Procedure Duration	Deep Sedation	0:24:05.38	0:04:31.134	-10.69	**0.00**
	Moderate Sedation	0:35:04.23	0:07:43.908	-10.45	
Length of stay	Deep Sedation	0:24:37.69	0:05:13.356	-6.62	**0.01**
	Moderate Sedation	0:32:28.73	0:08:55.780	-6.46	

3.5. Difference in patient satisfaction according to gender

An Independent T-test was carried out to determine if there is a difference between males and females on the level of patient satisfaction among the patients receiving deep sedation. The results showed that there was a significant difference on the level of all satisfaction constructs (Table 5).

Table 5. Difference in patient satisfaction according to gender (Deep Sedation Group, N=78)

		Mean	SD	t	P-value
I would want to have the same anesthetic again	Female	2.63	1.03	-1.92	**0.00**
	Male	2.95	0.22	-1.87	
I threw up or felt like throwing up	Female	-2.84	0.99	1.04	**0.04**
	Male	-3.00	0.00	1.00	
I felt relaxed	Female	2.92	0.27	-1.82	**0.00**

		Mean	SD	t	P-value
	Male	3.00	0.00	-1.78	
I felt pain during procedure	Female	-2.55	1.55	1.60	**0.00**
	Male	-2.95	0.22	1.56	
I felt safe	Female	3.00	0.00	0.97	**0.05**
	Male	2.98	0.16	1.00	
I itched	Female	-3.00	.000a	-	-
	Male	-3.00	.000a	-	

3.6. Relationship between type of sedation, patient satisfaction, and length of stay

A Pearson's bi-variate correlation was carried out to determine if there's a relationship type of sedation, patient satisfaction, and length of stay. The results there was a highly significant correlation between type of sedation and total patient satisfaction (P=0.03), length of stay (P=0.00), and procedure duration (P=0.00) (Table 6).

Table 6. Correlation between type of sedation, patient satisfaction, and length of stay

		Procedure Duration	Length of Stay	Total Satisfaction Score
Type of Sedation	R-value	0.66	0.48	-0.17
	P-value	**0.00**	**0.00**	**0.03**

4. DISCUSSION

Anesthetic control is limited to more or less local anesthesia or its conjunction of general anesthesia in gastrointestinal procedures such as gastroscopies and colonoscopies. Propofol is recognized as a rapid anesthetic drug with a beneficial pharmacologic profile similar to benzodiazepines and narcotics used for quick anesthesia initiation, quicker healing, and comparable amnesia rates. On the other hand, Midazolam is a central nervous system depressant that belongs to the family of benzodiazepines which is widely employed in the combination with prescription opioids during GI endoscopy for moderate sedation.

Upon statistical analysis, the results of this study showed that the use of deep sedation and namely Propofol in patients undergoing colonoscopies, has yielded in decreased length of stay and duration of the procedure thus faster recovery in comparison with the use of moderate sedation and namely midazolam. This is consistent with a previous study by Desai, Shriyan & Dasgupta,(2016), which have indicated that the use of midazolam in combination with other drugs as moderate sedation in endoscopic procedures has some drawbacks, such as a slow effect, residual sedative symptoms that hinder discharge and induce delayed healing, in addition to the incidence of respiratory distress. Hence effective methods of Propofol administering for gastrointestinal is more preferable. Our results were also consistent with Adigun et al. (2019) who conducted a study which examined patients undergoing colonoscopy where the patients received either Propofol or Midazolam for sedation, and have found that the patients who received Midazolam have experienced a substantial delay in the length of stay and recovery in comparison to those who received Propofol. The results of our study are also in line with a meta-analysis study that was carried out by McQuaide and Laine (2008), where Propofol was recorded to enable a faster recovery period of 15 min versus 50–55 min in a midazolam-based modality of sedation.

In addition, our findings were also consistent with a research performed by Vargo et al. (2002) in which 75 patients were allocated into a Propofol or Midazolam-Meperidine category, where procedure duration and revival period in the Propofol group was reduced (18.5 min) relative to 70.5 min in those receiving midazolam-meperidine as sedation, thus reducing the

length of stay of such patients. Our results were also in line with Singh and Srinivas (2017) which have examined the use of Midazolam versus Propofol in Intensive Care Unit Patients and have indicated that the use of Propofol indicated reduced length of stay and reduced time to tracheal extubation namely for dexmedetomidine group (7.4 ± 1.85) h, for Propofol (5.6 ± 1.56) h compared to midazolam (16.9 ± 15.62) h. Moreover, a study by Esmaoglu et al. (2009) have examined the effectiveness of Midazolam as moderate sedation and Dexmedetomidine as deep sedation and have found that the use of deep sedation have reduced ICU length of stay. Another study by Tan and Ho (2010) also have substantiated our results where it has indicated that the use of Midazolam as a sedative agent have contributed to a longer length of stay in comparison which use of deep sedation. Furthermore, another recent study by Aumpansub et al. (2017) have also been consistent with the findings of our study where it has indicated that the usage of Propofol sedation for endoscopic procedures has is more preferable than moderate sedation such as Midazolam, owing to its fast onset and low half-life thus yielding in a significant decrease of the overall duration of stay recovery area and could shorten patient turnaround time (TT), culminating in improved performance of endoscopy units.

The result of our study have also indicated that the employment of deep sedation using Propofol have yielded in higher patient satisfaction with the anesthesia on the level of all satisfaction constructs that have been stated in the Iowa Patient Satisfaction with Anesthesia Survey namely, "I would want to have the same anesthetic again", "I threw up or felt like throwing up", "I felt relaxed", "I felt pain during procedure", "I felt safe", and "I itched". These findings were consistent with a study conducted by Koshy et al. (2000) which have examined the use of both Propofol and Midazolam as part of a randomized control trial among 274 patients that have been undergoing colonoscopies and upper GI endoscopy, where the mentioned study have indicated that Propofol have yielded in exponentially higher levels of comfort in comparison with those patients who have received Midazolam as an anesthetic during the procedure. In addition, another study by Sipe et al. (2002) which have examined the use of Propofol versus Midazolam among patients undergoing gastrointestinal endoscopy have resulted in similar findings to our study, where it has shown than Propofol had a quicker sedating effect, more effective depth of anesthesia, faster time for recovery and higher patient satisfaction with the anesthesia experience. Our results were also consistent with Adigun et al. (2019) which have indicated the use of Propofol have yielded in lower perceived pain in patients undergoing colonoscopies in Nigeria, in comparison with the group who have received Midazolam as an anesthetic agent. Similarly, Lazaraki et al. (2007) have examined the use of deep sedation during colonoscopy procedures and have resulted in similar finding to ours, where reduced pain scores were prevalent in comparison to patients who have undergone colonoscopy under the effect of Midazolam as an anesthetic agent, thus deep sedation is contributing to higher satisfaction. Our results were also in line with Singh and Srinivas (2017), where the use of Propofol was found to induce higher patient satisfaction, lower pain score and low side effects.

Two previous studies have also tackled the use of anesthetic agents during endoscopic procedures (Yoo et al., 2015; Park et al., 2015) and have results in consistent findings to ours where Park et al. (2015) have suggested that persistent Propofol administration is preferable to midazolam injections for safer anesthesia which is a construct of patient satisfaction and improved surgical outcomes, and Yoo et al. (2015) have indicated that sufficient sedation using Propofol anesthesia makes for a lighter sedation duration and decreased respiratory ramifications. Similar to our results, a study by Delius et al. (2007) have shown that German endoscopists have classified Midazolam as an inefficient anesthetic for use in endoscopic procedures where 98% of the patients have reported painful experiences during their procedures. Furthermore, our results were consistent with a previous research study by Hajiani, Hashemi, & Sayyah (2018) which have the effects and side effects of Propofol and Midazolam in patients undergoing endoscopies in Imam Khomeini Hospital, Ahvaz, and have found that patient satisfaction, quality of care, and recovery time has been enhanced in the group receiving Propofol in comparison with those who received Midazolam. Our results were, also in line with Santos et al. (2013) which have examined Propofol versus Midazolam use during endoscopies and have found Propofol to yield higher tolerance among patients. Further, Agostoni et al. (2007) have also researched the use of Propofol and Midazolam among patients undergoing upper GI endoscopy and ultrasound endoscopy and have found that Propofol results in less discomfort

among patients and deeper sedation. Similarly, Alatise et al. (2015) have explored the employment of Propofol versus Midazolam in colonoscopies and have yielded in higher patient satisfaction and enhanced recovery times in comparison with Midazolam.

On the other hand, a study by Ekkelenkamp et al. (2013) have compared the effect of Midazolam versus Propofol on the patient comfort and quality of colonoscopy among patients, and the results were inconsistent with our results where the mentioned study have found that Midazolam yielded in lower pain score in comparison to Propofol, thus implying that moderate sedation was more comfortable and effective than deep sedation and therefore resulting in higher patient satisfaction and quality of care. Our study showed that more patients showed willingness to receive the same anesthetic again among the Propofol group while that was not reflected among the Midazolam group. This was inconsistent with a previous study by Shin et al. (2016), which have compared the use of Midazolam as an anesthetic to other modalities during a surgical endoscopic procedure and the study have yielded dissimilar results to ours where more patients in the control group have refused to use the same anesthetic than those who favored receiving Midazolam.

The results of our study have shown that generally male patients are less satisfied with their anesthetic experience, where age did not pose any significant difference regarding satisfaction. These results come inconsistently with previous research which have found that younger patients have reported more discomfort and needed higher doses of sedatives, while the results female patients undergoing endoscopies also have reported high discomfort (Childers et al., 2015; Seip et al., 2010).

5. LIMITATIONS

A limitation to the study would be recruiting patients from one clinical site which might prevent highlighting a diverse demographic profile which might have contributed to a richer set of data and therefore a multifaceted analysis, where different phenomena might have emerged.

6. CONCLUSION

With the growing advancement of therapeutic and diagnostic techniques beyond the operating room (OR), patient demands for anesthesia or controlled sedation have also grown. Sedation throughout a procedure relieves fear, discomfort and suffering. Effective sedation modalities during gastrointestinal endoscopic procedures are a key factor for the success of the procedure itself and the safeguarding the patients' safety, satisfaction and quality of care. With the widespread use of various modalities of sedation globally, researchers are still examining the various types of anesthetics in terms of patient safety and satisfaction, where traditional modalities are still generally used while certain new modalities such as the use of Propofol have been emerging. Hence, the employment of this new modality is still controversial in Lebanon. The purpose of this study was to examine effect of moderate versus deep sedation on the satisfaction and length of stay of patients undergoing colonoscopy in a Lebanese specialized endoscopy center. A quantitative approach using a quasi-experimentation design was adopted among a sample of 149 patients undergoing colonoscopy. This study have shown that concerning endoscopic procedures in the gastrointestinal system and specifically colonoscopies, deep sedation using Propofol was much more effective in enhancing patient's satisfaction and reducing the length of stay and procedure duration substantially, thus contributing to higher quality of care and improved performance of the endoscopy units.

7. IMPLICATIONS AND RECOMMENDATIONS

Future research is essential in developing a better understanding of the implications of using new modalities of anesthetics such as Propofol in inducing deep sedation, where it is recommended to carry out further longitudinal studies on a nationwide scope, which will help in substantiating the employment of this modalities based on evidence. The development of clinical guidelines based on the evidence generated by the conducted research in Lebanon and the region will also contribute to more effective procedural strategies regarding the use of sedation in endoscopies and will result in a uniform standard practice that safeguards the patients' safety

and quality of care. Qualitative work regarding the patients' experiences with sedation during endoscopic procedures would also add to the depth of knowledge that might influence clinical practice, as at the end care shall be patient centered and tailored around needs that might emerge in such type of research.

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