



ISSN NO. 2320-5407

Journal Homepage: - [www.journalijar.com](http://www.journalijar.com)

## INTERNATIONAL JOURNAL OF ADVANCED RESEARCH (IJAR)

Article DOI: 10.21474/IJAR01/10266  
DOI URL: <http://dx.doi.org/10.21474/IJAR01/10266>



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ADVANCED RESEARCH (IJAR)  
ISSN 2320-5407  
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Journal DOI: 10.21474/IJAR01

### **RESEARCH ARTICLE**

#### **PREVALENCE OF INTRAOPERATIVE AND POSTOPERATIVE COMPLICATIONS IN COLORECTAL SURGERY**

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#### **Manuscript Info**

#### **Abstract**

#### **Manuscript History**

Received: 17 November 2019  
Final Accepted: 19 December 2019  
Published: January 2020

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#### **Introduction:-**

Colorectal surgery is performed for many diseases such as colorectal cancer, ulcerative colitis, Crohn's disease, mechanical bowel obstruction and recurrent diverticulitis, often resulting in major reconstruction of the gastrointestinal tract. Injury, ischemia, rectal prolapse and proctological disorders may also require large or small bowel resection. Potential risks of colorectal surgery are mainly those of any major abdominal surgery, and usually occur while the patient is still in the hospital. Because of the many indications for and the various extents of colorectal or small bowel resections the rate and spectrum of complications differ.

The prevalence of complications intra- operative can help the doctor to avoid it and the complications postoperative can doctor preventive faster if he know the probability of complications.

#### **Rationale:**

This research, to the extent possible, will add to other relevant research as it will expand the area of knowledge of complications.

While there is no research within the kingdom, I have spoken about the prevalence of intra- operative and postoperative complications.

If we know the most common complications for any disease that can help we to asses and evaluate the patient and prevent anything unexpected to happening.

#### **Literature review:**

**-According to the other previous study like:**

**RESEARCH AIM:** To determine the prevalence of intra- and postoperative complications of colorectal surgery.

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**Objectives:-**

1. To determine the relationship of old age to increase the incidence of complications.
2. To determine the most common intra operative complications
3. To determine the most common postoperative complications
4. To see how clear the form of consent of surgery.

**Methodology:-****Study design:**

This is an analytical cross-sectional study.

**Study Setting and period:**

This is an analytical cross-sectional study conducted in kingdom of Saudi Arabia (General population and the patient from the King Fahad Armed Forces Hospital), from 1/4/2019 till 19/10/2019.

**Study population and sampling:****Study participants:**

**Inclusion criteria;** patient with past history of colorectal surgery. **Exclusion criteria;** negative past history of colorectal surgery.

**Sampling Method:-**

The study will be carried out by questionnaire.

**Sampling size:**

Sample size was calculated using OpenEpi for sample size calculation for cross-sectional studies, hypothesizing the true answers. Accordingly, **510** participants were gathered from the hospital patients. Score of prevalence of who have a past history of doing a Colorectal surgery 21.57%.

According to the prevalence study, the results indicated that most of the respondents are between 18-35 years old, 8.82% of the respondents did a colorectal surgery due to colorectal cancer, 10.78% due to ulcerative colitis, 5.49% due to Crohn's disease, 5.29% due to mechanical bowel obstruction, 7.06% of the respondents did a colorectal surgery due to Recurrent diverticulitis, the bleeding was the most common symptom chosen by those who experienced complications during surgery.

**Measurements:-**

Explanatory variables:

1. Sociodemographic characteristics: status, gender, age.
2. Disease-related information: Colorectal surgery, causes of Colorectal surgery, date of operations, complications that occurred intra-operative and post-operative.

Outcome measures

The outcome measure is by counting the ratio of the number of patients who have a past history of doing a Colorectal surgery this will be measured using:

By determining the extent of the complications that occurred intra-operative and post-operative associated with Colorectal surgery.

Prevalence study: will be carried out to test the questionnaire if easily understood and the response of the participants. Data from the cross-sectional study will be used to calculate the sample size.

Data Management and Analysis plan:

Data will be entered and analyzed using SPSS version 17.0. Descriptive statistics will be performed and categorical data will be displayed as frequencies and percentages while measures of central tendencies and measures of dispersion will be used to summarize continuous variables. Univariate and multivariate analysis will be performed to investigate association between exposure factors and associated disease. Statistical significance is set at a P value of 0.05 or less.

**Statistical analysis**

Data were entered and analyzed using Statistical Package for the Social Sciences (SPSS) version 17. Descriptive statistics were displayed as frequencies and percentages for categorical variables. Measures of central tendencies (the median), and measures of dispersion (minimum – maximum) were used to summarize continuous variables, as

the continuous variables were not normally distributed when tested by Shapiro-Wilk test. Univariate analysis was performed to investigate the association between the exposure factors with the outcome on the one hand, this was performed using Chi-squared test and Mann-Whitney test. Multivariate analysis to investigate factors independently was performed using binary logistic regression. P value was set at a significance level of < 0.05.

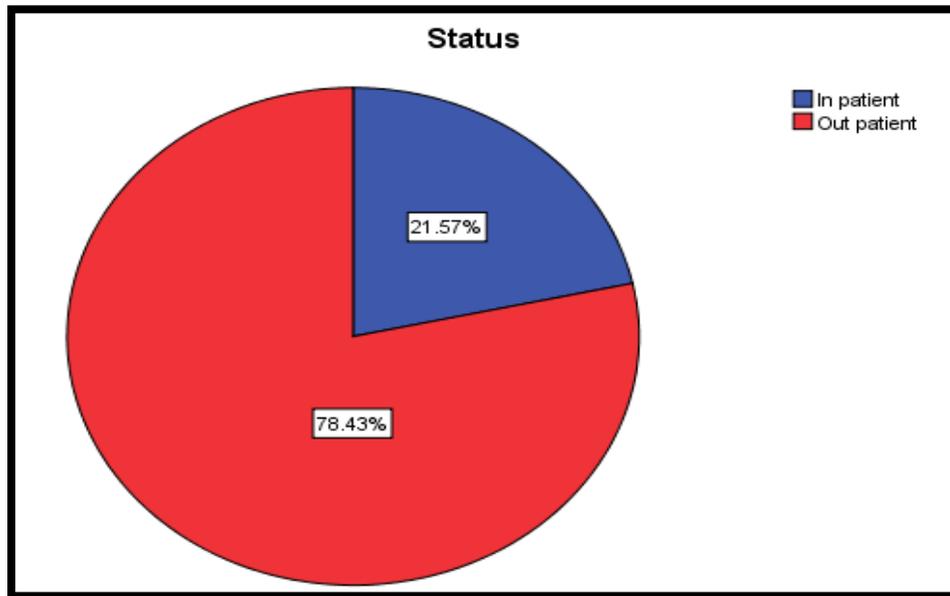
**Results:-**

In this study, the aim was to determine the prevalence of intra- and postoperative complications of colorectal surgery, 510 patients' participants, were consecutively recruited from in patients' clinics, during a period from 1/4/2019 to 19/10/2019

According to disease 21.57%, have a past history of doing a Colorectal surgery, 8.82% of the respondents did a colorectal surgery due to colorectal cancer, 10.78% due to ulcerative colitis, 5.49% due to Crohn's disease, 5.29% due to mechanical bowel obstruction, 7.06% of the respondents did a colorectal surgery due to Recurrent diverticulitis, the bleeding was the most common symptom chosen by those who experienced complications during surgery.

Status

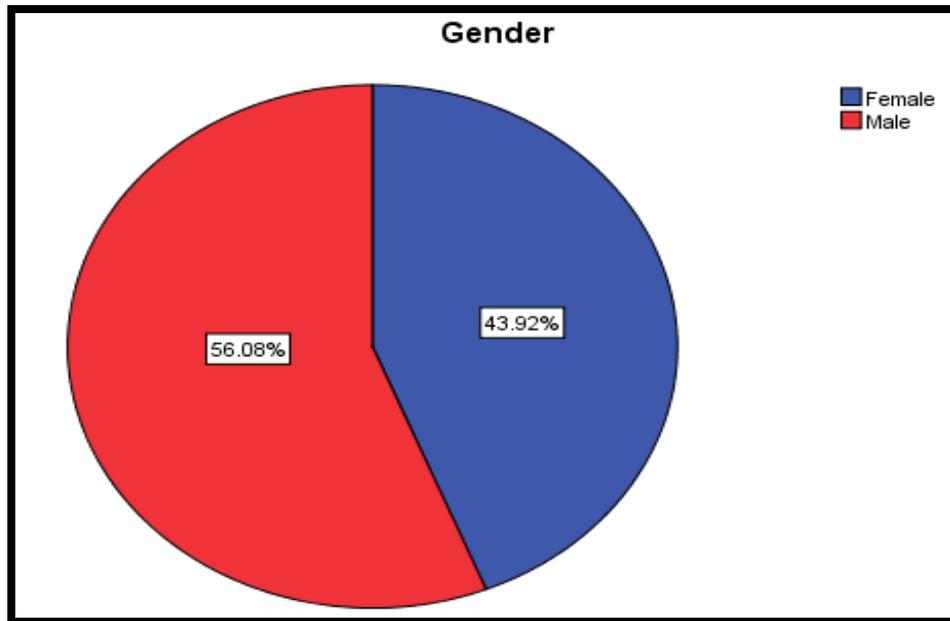
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	In patient	110	21.6	21.6	21.6
	Out patient	400	78.4	78.4	100.0
	Total	510	100.0	100.0	



Gender

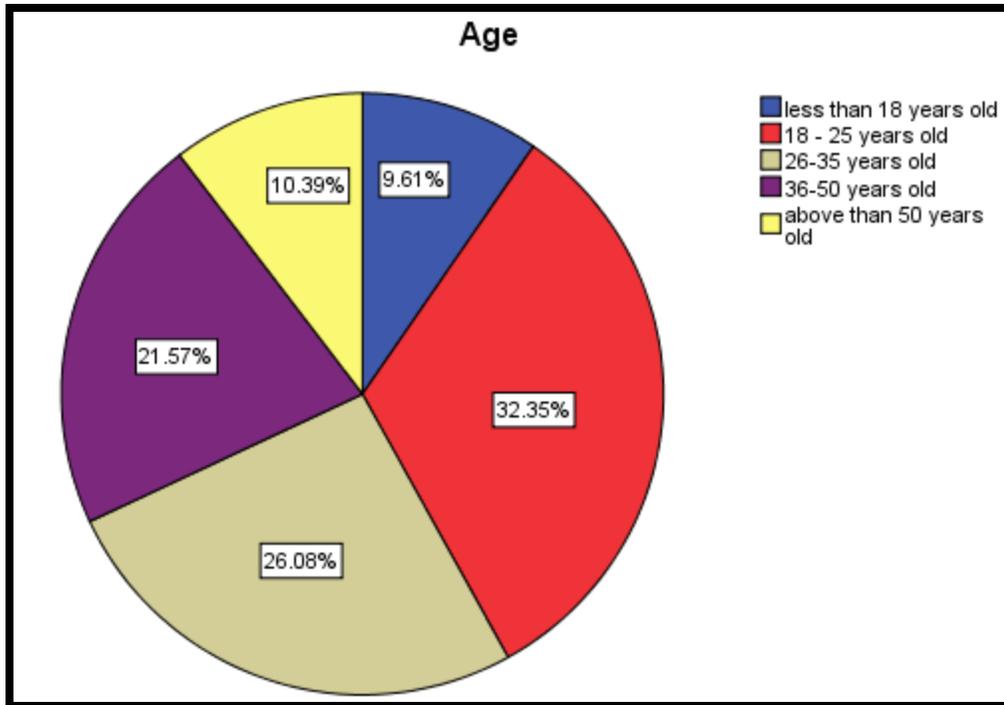
	Frequency	Percent	Valid Percent	Cumulative Percent
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Valid	Female	224	43.9	43.9	43.9
	Male	286	56.1	56.1	100.0
	Total	510	100.0	100.0	



**Age**

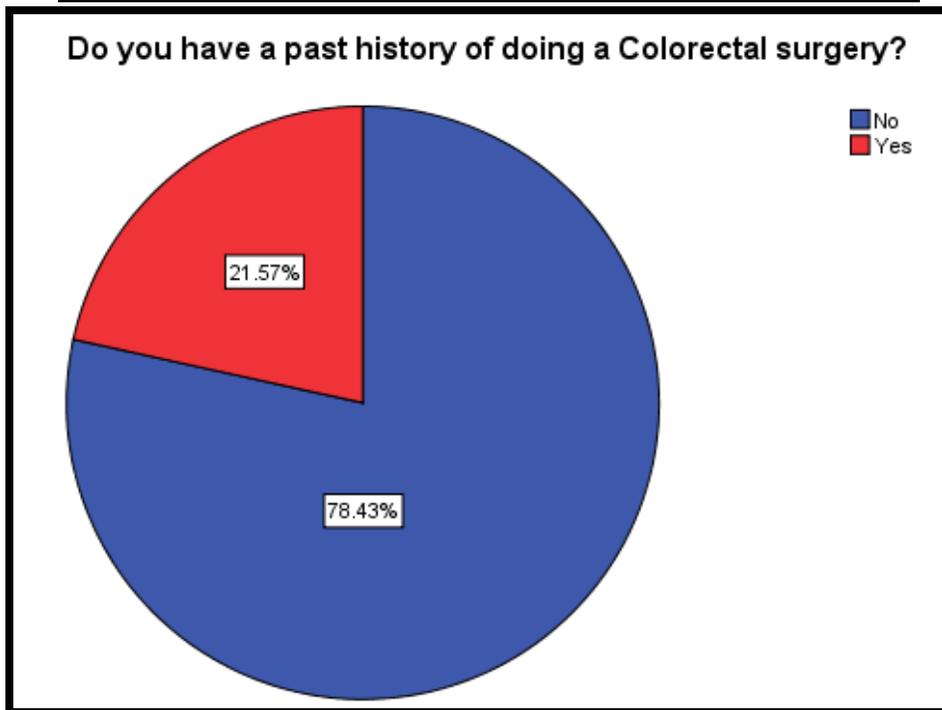
	Frequency	Percent	Valid Percent	Cumulative Percent
Valid less than 18 years old	49	9.6	9.6	9.6
18 - 25 years old	165	32.4	32.4	42.0
26-35 years old	133	26.1	26.1	68.0
36-50 years old	110	21.6	21.6	89.6
above than 50 years old	53	10.4	10.4	100.0
Total	510	100.0	100.0	



**Do you have a past history of doing a Colorectal surgery?**

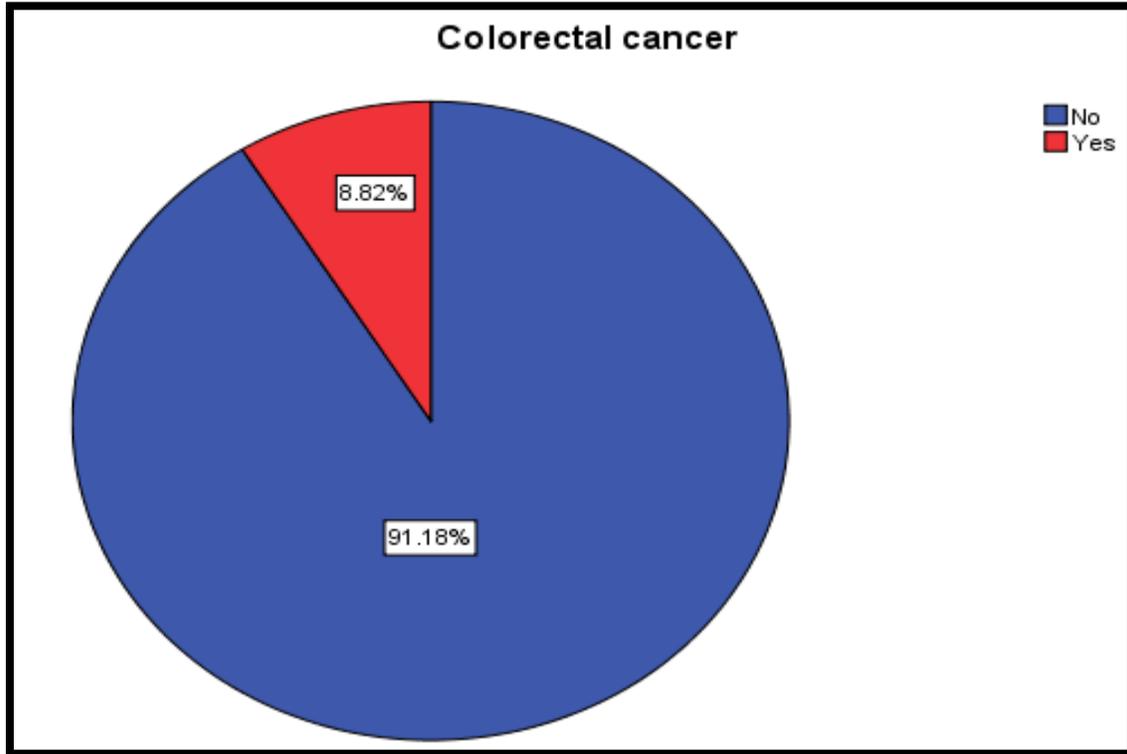
	Frequency	Percent	Valid Percent	Cumulative Percent
Valid No	400	78.4	78.4	78.4
Yes	110	21.6	21.6	100.0
Total	510	100.0	100.0	

**Do you have a past history of doing a Colorectal surgery?**



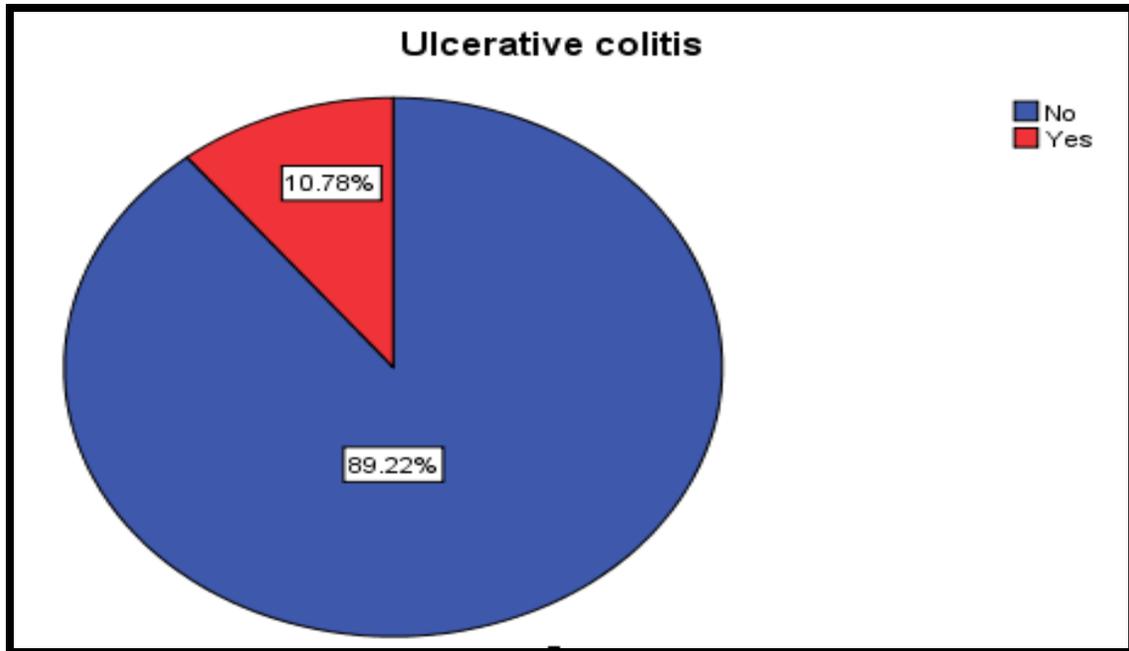
**Colorectal cancer**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	465	91.2	91.2	91.2
	Yes	45	8.8	8.8	100.0
	Total	510	100.0	100.0	



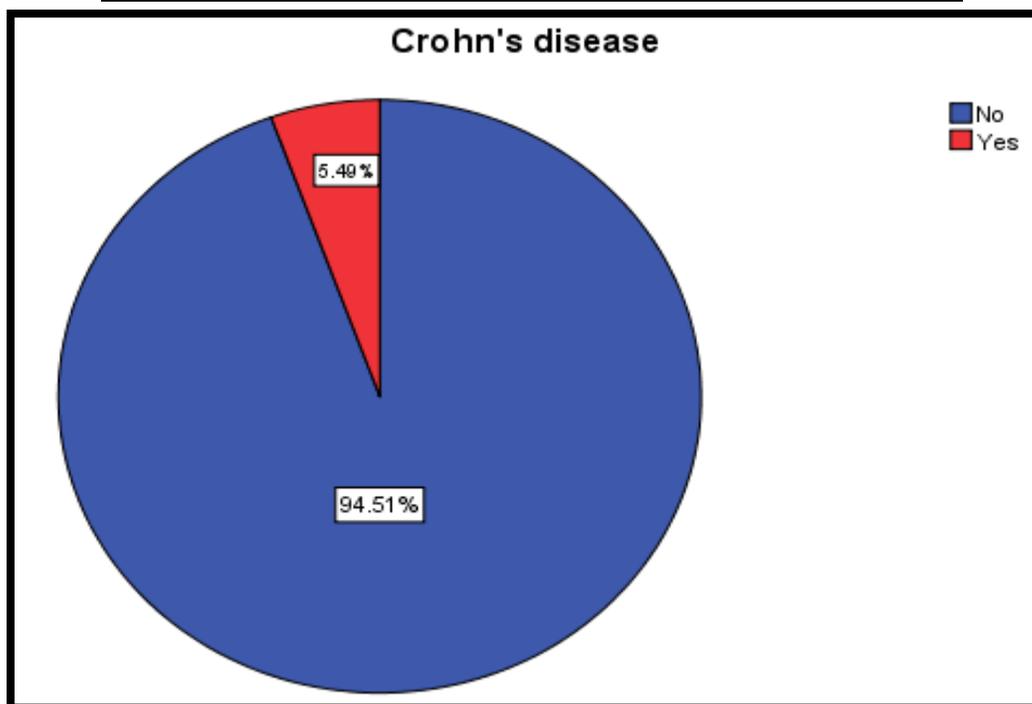
**Ulcerative colitis**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	455	89.2	89.2	89.2
	Yes	55	10.8	10.8	100.0
	Total	510	100.0	100.0	



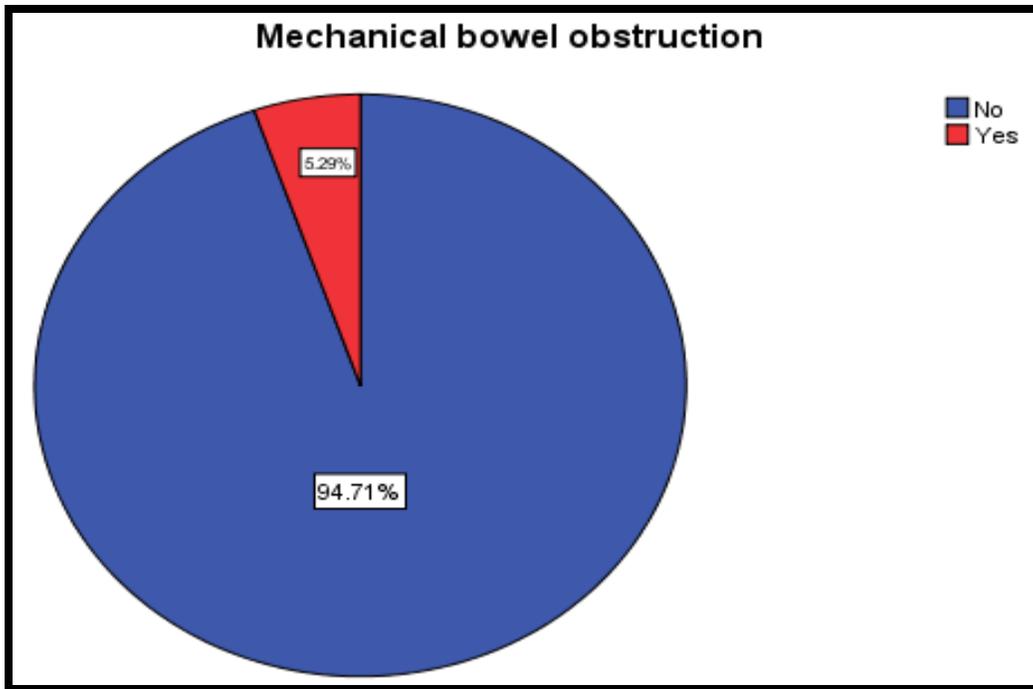
**Crohn's disease**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	482	94.5	94.5	94.5
	Yes	28	5.5	5.5	100.0
Total		510	100.0	100.0	



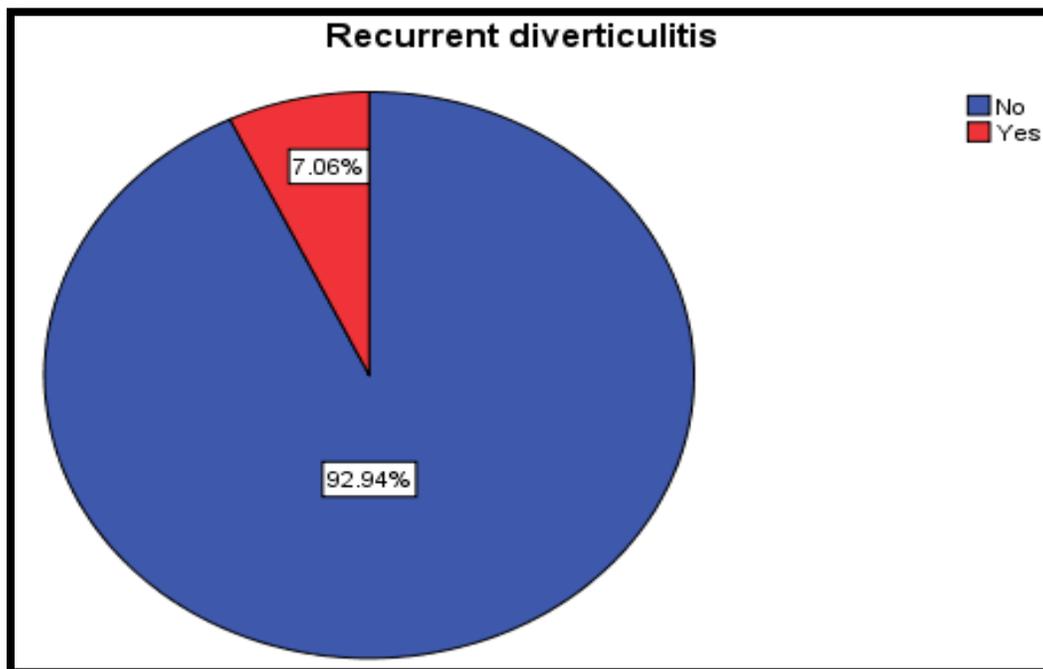
**Mechanical bowel obstruction**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	483	94.7	94.7	94.7
	Yes	27	5.3	5.3	100.0
	Total	510	100.0	100.0	



**Recurrent diverticulitis**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	474	92.9	92.9	92.9
	Yes	36	7.1	7.1	100.0
	Total	510	100.0	100.0	

**Other**

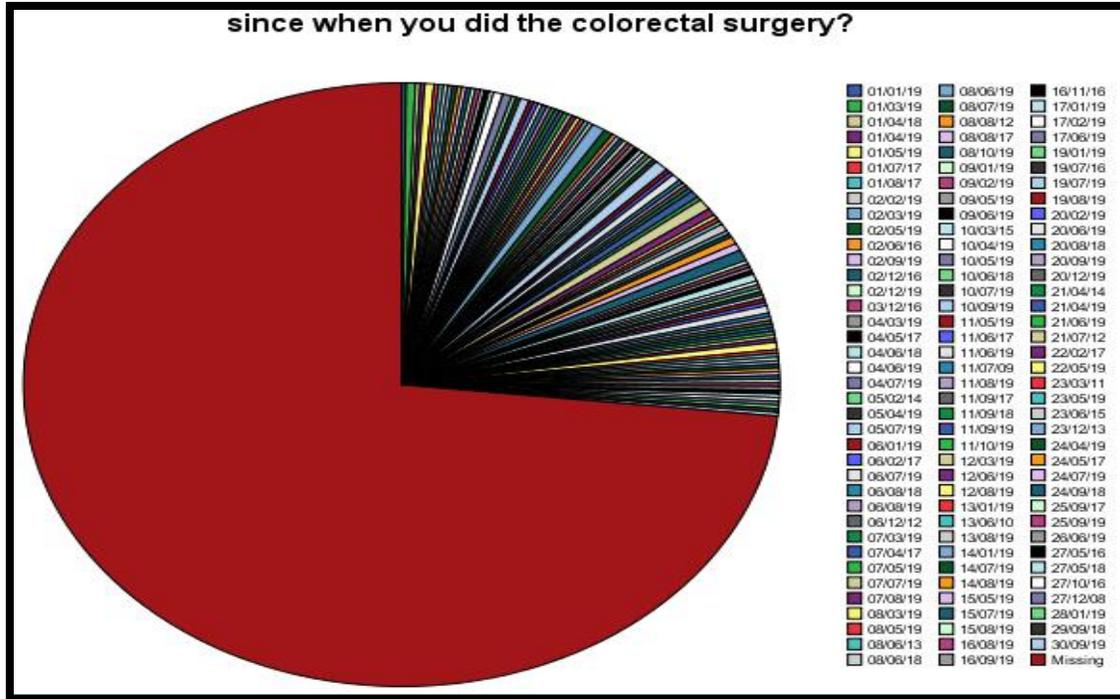
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	494	96.9	96.9	96.9
	شرح في فتحة الشرج	1	.2	.2	97.1
	مراره	2	.4	.4	97.5
	لا يوجد	1	.2	.2	97.6
	انحراف المستقيم	1	.2	.2	97.8
	لا يوجد سبب للجراحة مجرد متابعة	1	.2	.2	98.0
	الزائدة الدودية	2	.4	.4	98.4
	جراحة المرارة	1	.2	.2	98.6
	cholecystitis	1	.2	.2	98.8
	appendix	1	.2	.2	99.0
	ثقب غشاء طبل	1	.2	.2	99.2
	ولادة	1	.2	.2	99.4
	شفط دهون	1	.2	.2	99.6
	تكيم	1	.2	.2	99.8
	لم يتم عمل عملية	1	.2	.2	100.0
	Total	510	100.0	100.0	

since when you did the colorectal surgery?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	01/1/19	1	.2	.7	.7
	01/3/19	2	.4	1.5	2.2
	01/4/18	1	.2	.7	2.9
	01/4/19	1	.2	.7	3.7
	01/5/19	2	.4	1.5	5.1
	01/7/17	1	.2	.7	5.9
	01/8/17	1	.2	.7	6.6
	02/2/19	1	.2	.7	7.4
	02/3/19	1	.2	.7	8.1
	02/5/19	1	.2	.7	8.8
	02/6/16	1	.2	.7	9.6
	02/9/19	1	.2	.7	10.3
	02/12/16	1	.2	.7	11.0
	02/12/19	1	.2	.7	11.8
	03/12/16	1	.2	.7	12.5
	04/3/19	1	.2	.7	13.2
	04/5/17	1	.2	.7	14.0
	04/6/18	1	.2	.7	14.7
	04/6/19	2	.4	1.5	16.2
	04/7/19	2	.4	1.5	17.6
	05/2/14	1	.2	.7	18.4
	05/4/19	1	.2	.7	19.1
	05/7/19	2	.4	1.5	20.6
	06/1/19	1	.2	.7	21.3
	06/2/17	1	.2	.7	22.1
	06/7/19	1	.2	.7	22.8
	06/8/18	1	.2	.7	23.5
	06/8/19	1	.2	.7	24.3
	06/12/12	1	.2	.7	25.0
	07/3/19	1	.2	.7	25.7
	07/4/17	1	.2	.7	26.5
	07/5/19	1	.2	.7	27.2
	07/7/19	1	.2	.7	27.9
	07/8/19	1	.2	.7	28.7
	08/3/19	1	.2	.7	29.4
	08/5/19	1	.2	.7	30.1
	08/6/13	1	.2	.7	30.9
	08/6/18	1	.2	.7	31.6

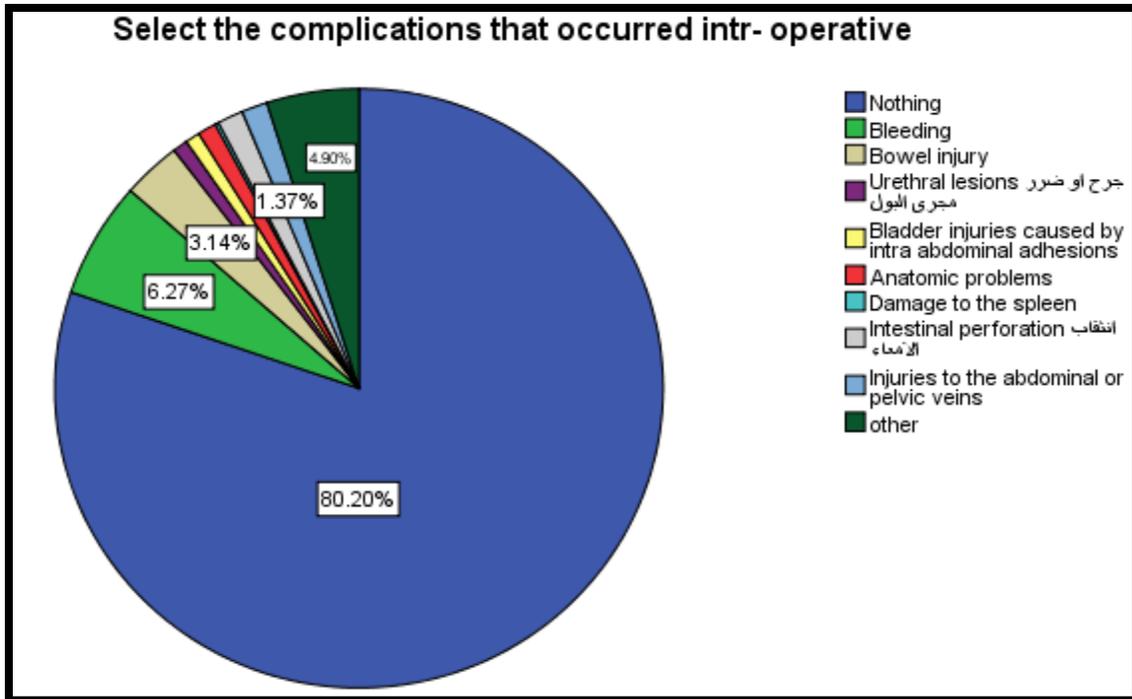
08/6/19	3	.6	2.2	33.8
08/7/19	2	.4	1.5	35.3
08/8/12	1	.2	.7	36.0
08/8/17	1	.2	.7	36.8
08/10/19	1	.2	.7	37.5
09/1/19	1	.2	.7	38.2
09/2/19	1	.2	.7	39.0
09/5/19	1	.2	.7	39.7
09/6/19	1	.2	.7	40.4
10/3/15	1	.2	.7	41.2
10/4/19	1	.2	.7	41.9
10/5/19	1	.2	.7	42.6
10/6/18	1	.2	.7	43.4
10/7/19	1	.2	.7	44.1
10/9/19	3	.6	2.2	46.3
11/5/19	1	.2	.7	47.1
11/6/17	1	.2	.7	47.8
11/6/19	2	.4	1.5	49.3
11/7/09	1	.2	.7	50.0
11/8/19	1	.2	.7	50.7
11/9/17	1	.2	.7	51.5
11/9/18	1	.2	.7	52.2
11/9/19	2	.4	1.5	53.7
11/10/19	1	.2	.7	54.4
12/3/19	3	.6	2.2	56.6
12/6/19	2	.4	1.5	58.1
12/8/19	1	.2	.7	58.8
13/1/19	1	.2	.7	59.6
13/6/10	1	.2	.7	60.3
13/8/19	2	.4	1.5	61.8
14/1/19	1	.2	.7	62.5
14/7/19	1	.2	.7	63.2
14/8/19	2	.4	1.5	64.7
15/5/19	2	.4	1.5	66.2
15/7/19	3	.6	2.2	68.4
15/8/19	1	.2	.7	69.1
16/8/19	1	.2	.7	69.9
16/9/19	1	.2	.7	70.6
16/11/16	1	.2	.7	71.3
17/1/19	2	.4	1.5	72.8
17/2/19	1	.2	.7	73.5
17/6/19	1	.2	.7	74.3

19/1/19	1	.2	.7	75.0
19/7/16	1	.2	.7	75.7
19/7/19	1	.2	.7	76.5
19/8/19	1	.2	.7	77.2
20/2/19	1	.2	.7	77.9
20/6/19	2	.4	1.5	79.4
20/8/18	1	.2	.7	80.1
20/9/19	1	.2	.7	80.9
20/12/19	1	.2	.7	81.6
21/4/14	1	.2	.7	82.4
21/4/19	1	.2	.7	83.1
21/6/19	1	.2	.7	83.8
21/7/12	1	.2	.7	84.6
22/2/17	1	.2	.7	85.3
22/5/19	2	.4	1.5	86.8
23/3/11	1	.2	.7	87.5
23/5/19	1	.2	.7	88.2
23/6/15	1	.2	.7	89.0
23/12/13	1	.2	.7	89.7
24/4/19	1	.2	.7	90.4
24/5/17	1	.2	.7	91.2
24/7/19	1	.2	.7	91.9
24/9/18	1	.2	.7	92.6
25/9/17	1	.2	.7	93.4
25/9/19	1	.2	.7	94.1
26/6/19	1	.2	.7	94.9
27/5/16	1	.2	.7	95.6
27/5/18	1	.2	.7	96.3
27/10/16	1	.2	.7	97.1
27/12/08	1	.2	.7	97.8
28/1/19	1	.2	.7	98.5
29/9/18	1	.2	.7	99.3
30/9/19	1	.2	.7	100.0
Total	136	26.7	100.0	
Missing System	374	73.3		
Total	510	100.0		



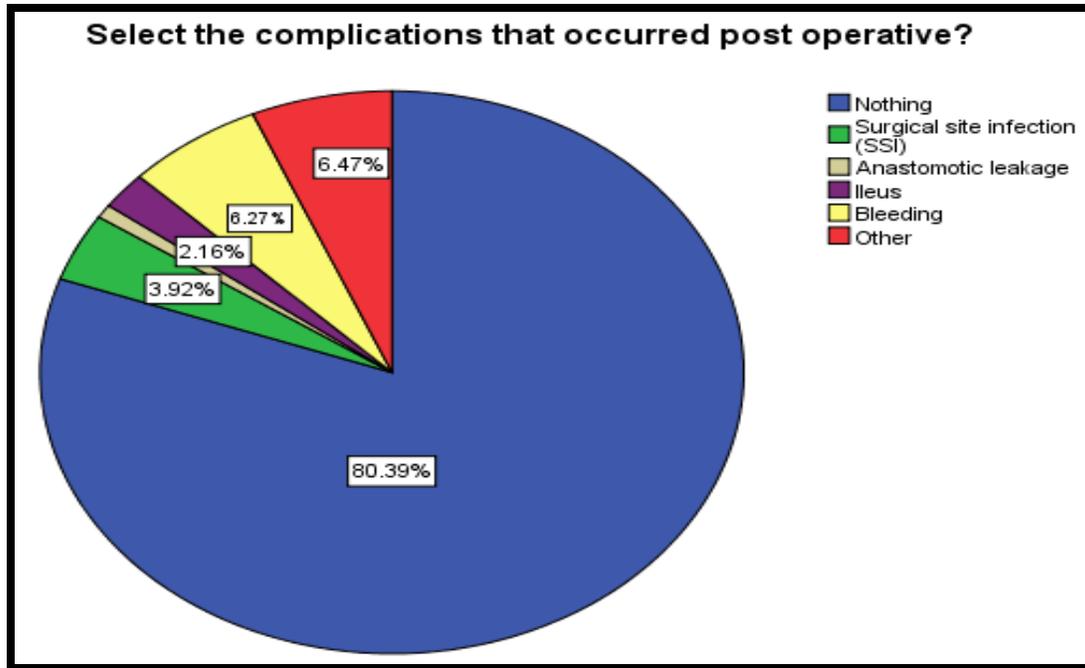
Select the complications that occurred intr- operative

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Nothing	409	80.2	80.2	80.2
Bleeding	32	6.3	6.3	86.5
Bowel injury	16	3.1	3.1	89.6
Urethral lesions مجرى البول	4	.8	.8	90.4
Bladder injuries caused by intra abdominal adhesions	4	.8	.8	91.2
Anatomic problems	5	1.0	1.0	92.2
Damage to the spleen	1	.2	.2	92.4
Intestinal perforation انثقاب الامعاء	7	1.4	1.4	93.7
Injuries to the abdominal or pelvic veins	7	1.4	1.4	95.1
Other	25	4.9	4.9	100.0
Total	510	100.0	100.0	



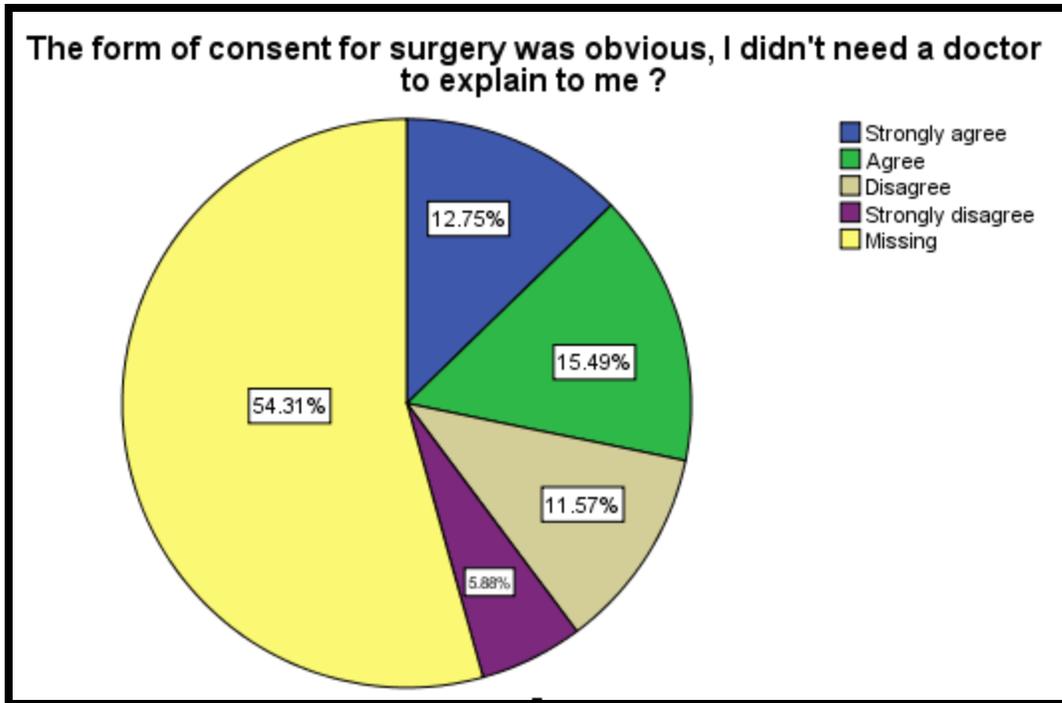
**Select the complications that occurred post operative?**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Nothing	410	80.4	80.4	80.4
Surgical site infection (SSI)	20	3.9	3.9	84.3
Anastomotic leakage	4	.8	.8	85.1
Ileus	11	2.2	2.2	87.3
Bleeding	32	6.3	6.3	93.5
Other	33	6.5	6.5	100.0
Total	510	100.0	100.0	



**The form of consent for surgery was obvious, I didn't need a doctor to explain to me ?**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly agree	65	12.7	27.9	27.9
	Agree	79	15.5	33.9	61.8
	Disagree	59	11.6	25.3	87.1
	Strongly disagree	30	5.9	12.9	100.0
	Total	233	45.7	100.0	
Missing	System	277	54.3		
	Total	510	100.0		



### Discussion:-

This study was based on a number of **510** participants, from this study as the number of have a past history of doing a Colorectal surgery is 110, most of the respondents did a colorectal surgery due to ulcerative colitis.

The current study showed statistically significant (P value is 0.01) and (P value is 0.05),

Through the questionnaire it was found that the majority of those who had colorectal surgery did not experience any complications after the surgery, but bleeding was the largest complication that affected those who suffered complications after surgery.

### Conclusion:-

The results showed very positive results due to that most of the respondents do not have a past history of doing a Colorectal surgery.

It is clear from the results that most of the respondents did a colorectal surgery due to ulcerative colitis.

It was clear from the results that the majority of those who had colorectal surgery did not experience any complications during the surgery, but bleeding was the largest complication that affected those who suffered complications during surgery.

And it was clear from the results that the majority of those who had colorectal surgery did not experience any complications after the surgery, but bleeding was the largest complication that affected those who suffered complications after surgery.

### Recommendation:-

we recommend setting up health education programs about colorectal surgery, this health problem must be presented broadly and beneficially and, in a way, that everyone understands.

### Acknowledgement:-

The authors would like to thank the participants for their great cooperation, Participants will be especially from general population selected and carried out by questionnaire.

**We thank the data collectors** who collected the data from the patients, they worked hard to collect data greatly, and a large sample number was collected for their great effort.

### **Ethical considerations**

Administrative approval will be sought from the unit of biomedical ethics research committee Ethical approval will be sought from the ethical committee of the faculty of medicine, king Abdulaziz University. An informed consent will be sought from the participants.

**Source of funding:** self-funded

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

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### **APPENDIXES**

#### Questionnaire

##### **Status**

- **In patient**
- **Out patient**

##### **Gender**

- **Female**

- Male
- Age
- less than 18 years old
- 18 - 25 years old
- 26-35 years old
- 36-50 years old
- above than 50 years old

**Do you have a past history of doing a Colorectal surgery?**

- No
- Yes
- Colorectal cancer**
- No
- Yes
- Ulcerative colitis**
- No
- Yes
- Crohn's disease**
- No
- Yes
- Mechanical bowel obstruction**
- No
- Yes
- Recurrent diverticulitis**
- No
- Yes
- Other**
- No
- شرح في فتحة الشرج
- مراره
- لا يوجد
- انحراف المستقيم
- لا يوجد سبب للجراحة مجرد متابعة
- الزائدة الدودية
- جراحة المرارة
- Cholecystitis
- Appendix
- ثقب غشاء طبل
- ولادة
- شفت دهون
- تكميم
- لم يتم عمل عملية

**since when you did the colorectal surgery?**

**Select the complications that occurred intr- operative**

- Nothing
- Bleeding
- Bowel injury
- جرح او ضرر مجرى البول
- Bladder injuries caused by intra abdominal adhesions
- Anatomic problems
- Damage to the spleen
- Intestinal perforation انتقاب الامعاء

- Injuries to the abdominal or pelvic veins
- Other
- Select the complications that occurred post operative?**
- **Nothing**
- **Surgical site infection (SSI)**
- **Anastomotic leakage**
- **Ileus**
- **Bleeding**
- **Other**
- The form of consent for surgery was obvious, I didn't need a doctor to explain to me ?**
- **Strongly agree**
- **Agree**
- **Disagree**
- **Strongly disagree**
- **Total**