

## THE IMPACT OF MINIMAL INVASIVE SURGERY COURSE AND THE BARRIERS FACED BY GENERAL SURGEONS IN ITS IMPLEMENTATION

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### ABSTRACT

**Objective:** To assess the impact of Minimal Invasive Surgery (MIS) course for Surgeons of Quetta and to identify the barriers to adoption of MIS in Quetta.

**Study Design:** Cross sectional descriptive study.

**Place and Duration of Study:** Sheikh Khalifa Bin Zayed Medical Complex, Quetta, from Jan to Jul 2017.

**Methodology:** Surgeons of Quetta who attended Minimal Invasive Surgery course were included in the study. After 6 months of the course, data was collected from the surgeons. The questionnaire had closely ended self-administered questionnaire having 15 questions regarding use of MIS in practice and possible barriers to non-implementation. Data was analyzed by using IBM SPSS Statistics version 20. Frequency and percentages were calculated for the categorical variables.

**Results:** Questionnaire was sent to 43 participants, 37 completed the proforma. Response rate was 86%. There were 31 male (83.8%) and 6 (16.2%) female. There were 31 male (83.8%) and 6 (16.2%) female out of 43 Surgeons. The majority of the fellow surgeons were from year 2001-2005 (37.8%). About 59.5% of the surgeons belonged to academic. The focus of the practice of majority of the surgeons was general (97.3%). Ninety four point six percent of the Surgeons who attended the course had improved the understanding and skills of MIS. Only 51.4% cholecystectomy, 21.6% appendectomy and 16.2% oophorectomy of the Surgeons were able to perform Minimal Invasive Surgery in Quetta. The most common barrier for not performing Minimal Invasive Surgery in Quetta were lack of resources and lack of trained nursing staff 94.5%.

**Conclusion:** The course of Minimal Invasive Surgery (MIS) has brought a positive change in Surgeons of Quetta towards implementation of MIS in their practice however barriers like lack of resources, trained nursing and experienced assistants are hindering factor for adoption of MIS

**Keywords:** Advanced course, Basic course, Intermediate course, Laparoscopy, Learning.

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### INTRODUCTION

Minimal Invasive surgery has gained popularity and is considered to have more benefits over open surgery especially in terms of reduced pain, shorter recovery period of patients and better cosmetics. It has replaced the traditional open surgery technique and has become the method of choice for cholecystectomy, appendectomy, oophorectomy etc.<sup>1,2</sup>.

Adoption of Minimal Invasive Surgeries or procedures in clinical practice requires skills which need proper training<sup>3</sup>. There are numerous studies that reflect the importance of interven-

tional techniques and trainings for improvement of laparoscopic skills. Therefore, practicing surgeons need formal training so that they can be equipped with the necessary competencies for adopting Minimal Invasive Surgeries (MIS) and procedures in their clinical practice<sup>4</sup>.

Various comprehensive courses on Minimal Invasive Surgeries are attended by the Surgeons so that they can perform required procedures in their practice efficiently. There are short length courses ranging from 2- 5 days and as well as full fellowship training programs.

According to several interventional studies, Minimal Invasive Surgery has more advantages over open surgery, however it is still not extensively performed in low and middle income countries due to several issues<sup>5</sup>, Inclusive courses

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on Minimal Invasive Surgeries are also conducted in Quetta, Pakistan to facilitate the surgeons to improve their clinical skills. However, despite attending MIS courses and showing interest in implementing Minimal Surgeries, the adoption of MIS in Quetta is still quite rare. Majority of the Surgeons in Quetta are still practicing open surgery techniques in their clinical practice despite being aware of the benefits of Minimal Invasive Surgeries. In initial years, the main barrier in wide scale adoption of Minimal Invasive Surgery was that Surgeons were not competent to perform MIS efficiently. But this barrier has been overcome by the several courses and training programs<sup>6</sup>. There could be number of reasons why Surgeons are not performing Minimal Invasive Surgeries in their clinical practice. They may include either inadequate training or other logistic barriers that are affecting the Surgeons for not performing Minimal Invasive Surgeries.

Literature exists that there could be multiple barriers to adoption of new learning and skills of Minimal Invasive Surgery. The barrier could be either on the surgeon's part i.e. lack of interest, lack of formal training or others factors like resources, inadequate trained nursing or assistants etc. For ensuring success of Minimal Invasive Surgeries, barriers and challenges need to be identified and overcome.

Therefore, the purpose of this study is to assess the effectiveness of courses and training programs on Minimal Invasive Surgeries in Quetta and to identify the reasons and barriers if it is not being practiced widely despite having adequate awareness of this clinical technique.

## MATERIAL AND METHODS

We conducted a cross-sectional descriptive study. After taking approval from the Ethical Review Committee a questionnaire was sent to the Fellow Surgeons of Quetta, Balochistan who attended the Intermediate Minimal Invasive Surgery course scheduled on 10-13 January 2017. The sample size was calculated with WHO sample size calculator. By considering the value of confidence level as 95%, anticipation population

0.5 and absolute precision required as 0.3 sample size of 43 was calculated. After 6 months of the course questionnaire was sent to 43 Fellow surgeons who were enrolled. The data was collected from Surgeons using purposive sampling from Jun 2017 to July 2017. Written informed consent was also taken by the participants. The questionnaire had closely ended self-administered questionnaire having 15 questions. The question-

**Table-I: Demographic data of Minimal invasive surgery course participants.**

S. No.	Characteristics (n= 37)	Frequency (%)
1	<i>Gender</i>	
	Male	31 (83.8%)
	Female	6 (16.2)
2	<i>Fellowship Year</i>	
	95-2000	4 (10.8%)
	2001-2005	14 (37.8%)
	2006-2010	12 (32.4%)
	2011-2015	6 (13.2%)
	2016-2020	1 (2.7%)
3	<i>Where do you practice</i>	
	Academic	22 (59.5%)
	Community base	15 (40.5%)
4	<i>Focus of your practice</i>	
	General	36 (97.3%)
	Hepatobiliary	1 (2.7%)
	Upper GIT	-
	Lower GIT	-

naire was validated with two subject specialist and reliability was calculated through cronbach alpha. Data was analyzed by using IBM SPSS Statistics version 20. Descriptive statistics were used to calculate mean and standard deviation for continuous variables, whereas frequency and percentage for the categorical variables.

## RESULTS

Out of 43 Surgeons of Quetta who participated in the Intermediate Minimal Invasive Surgery Course, 37 participants responded the questionnaire. Demographic data of participants is given in table-I.

The overall impact of the course was towards positive change 73%. Ninety four point six percent of the Surgeons who attended the course had improve the understanding of Minimal Invasive Surgery in diagnosis and pre-operative evaluation followed by Evidence (Open

vs. MIS) 89.4% and also improved their general MIS skills 97.3%. Whereas only 51.4% cholecystectomy, 21.6% appendectomy and 16.2% oophorectomy of the Surgeons were able to perform Minimal Invasive Surgery in Quetta. The result shows that the most likely barrier for not performing Minimal Invasive Surgery in Quetta are lack of resources and lack of trained nursing staff

course has brought a positive change in their understanding and skills and towards practicing Minimal Invasive Surgery in their workplace.

The study also demonstrates that despite attending the course majority of the Surgeons of Quetta are still not able to perform Minimal Invasive Surgeries in their clinical practice. Only 51.6% were able to perform Cholecystectomy

**Table-II: Effect of attending intermediate minimal invasive surgery course in Quetta.**

S. No.	Characteristics	Yes	No
		Frequency (%)	Frequency (%)
1	Has the Minimal Invasive Surgery (MIS) course improved understanding of:		
	Diagnosis of the disease	35 (94.6%)	2 (5.4%)
	Pre-operative evaluation	35 (94.6%)	2 (5.4%)
	Surgical approach	28 (75.5%)	9 (24.3%)
	Evidence: Open vs MIS	29 (78.4%)	8 (21.6%)
2	Patients follow up	33 (89.2%)	4 (10.8%)
	Has the MIS course helped to develop your MIS skills:		
	General MIS Skills	36 (97.3%)	1 (2.7%)
	Two hand dissection	28 (75.5%)	9 (24.3%)
3	Use of hand port	31 (83.8%)	6 (16.2%)
	Use of harmonic scalpel	17 (45.9%)	20 (54.1%)
	Has the MIS course helped you to perform following procedures?		
	Cholecystectomy	19 (51.4%)	18 (48.6%)
Appendectomy	8 (21.6%)	29 (78.4%)	
Oophorectomy	6 (16.2%)	31 (83.8%)	

**Table-III: Barriers for performing Minimal Invasive Surgery in Quetta (n=37).**

S. No.	Characteristics	Responses of Barriers	
		Most likely barrier	Least Likely barrier
1	Barrier less time	3 (8.1%)	34 (91.8%)
2	Lack of resources	35 (94.5%)	2 (5.4%)
3	Hospital privileges	24 (64.8%)	13 (35.1%)
4	Inadequate remunerations	18 (48.6%)	19 (51.3%)
5	Lack of trained nurses	35 (94.5%)	2 (5.4%)
6	Lack of experience assistant	31 (83.7%)	6 (16.2%)
7	Additional training courses	2 (5.4%)	35 (94.5%)

94.5% followed by lack of inexperience assistance 83.7% and hospital privileges 64.8% (table-II & III).

## DISCUSSION

This study evaluated the impact of Minimal Invasive Surgical Course and the barriers affecting the Surgeons in Quetta for adopting Minimal Invasive Surgeries. The study indicates that about 73% of the Surgeons believed that the

whereas other procedures like Appendectomy and Oophorectomy were not performed adequately via MIS. Although 94.6% had improved the understanding and knowledge of MIS and 97.3% believed that they had also enhanced their skills of implementing MIS in their practice after attending the course. But many barriers were identified and it is observed that lack of resources in hospitals, trained nursing staff and experienced assistants turned out to be the main barriers

for not adopting Minimal Invasive Surgeries in Quetta.

Some studies on the impact of Minimal Invasive Surgery conducted in the past supported the result of our study. Daniel *et al* determined the impact of Minimal Invasive Surgery on Surgeon practice and they reported that majority of the surgeons felt substantial improvement in understanding and skills. On contrary to our study, they reported that majority of the respondents were able to introduce Minimal Surgical Skills in their clinical practice<sup>8</sup>. Similarly, a study to identify the impact of laparoscopic surgical training was conducted by Torricelli *et al*. They emphasized that short course can improve laparoscopic surgeries; full laparoscopic training or fellowship program is the best way of stimulating laparoscopic dissemination<sup>7</sup>.

There is substantial literature regarding the potential barriers to uptake laparoscopic surgeries. Weizman *et al* carried out a survey on barriers on adoption to Laparoscopic Surgery. A cross-sectional survey was conducted. A questionnaire was deployed to Gynaecologists via email all across United States and received responses from 210 participants<sup>8</sup>. They identified the challenges that impede adoption of laparoscopy in gynecologic surgery. Unlike barriers identified in this study they reported lack of adequate surgical volume and reluctance of managing unexpected scenarios were the most highly rated limiting factors. Choy *et al* performed a study on barriers to the uptake of laparoscopic surgeries in a lower-middle income country. They found lack of funding for laparoscopic surgeries was the most likely barrier for adopting Minimal Invasive Surgeries<sup>11</sup>. Daniel, Birch *et al* did another study on the feasibility of introducing minimal surgery into clinical practice. It was a cross-sectional survey on all community surgeons in Ontario<sup>10</sup>. Like our study, they also reported that barriers to establishing MIS included operating room access, resources, equipment, trained nursing staff and assistants were the most important barriers.

Our study draws our attention to the fact that Minimal Invasive Surgery course have brought a positive change in Surgeons of Quetta in understanding and skills of Minimal Invasive procedures. But due to some barriers identified in this study, they are not able to effectively practice Minimal Invasive Surgeries. Government, Hospital and Institutions of Quetta should take serious action to improve the barriers identified in this study<sup>11-18</sup>.

One of the limitations of the study is that since there are few Fellow practicing Surgeons in Quetta, thus the findings have limited generalizability.

Hence, it is recommended that this study be replicated across other cities of Pakistan to identify the barriers if any for implementing Minimal Surgeries effectively. Even in the larger cities it needs to be assessed if the Minimal invasive surgery is widely being used.

## CONCLUSION

Despite the significant improvement in surgical care in developed in Pakistan still there are limitations in the adoption of MIS in Quetta. The course of Minimal invasive Surgery (MIS) has brought a positive change in Surgeons of Quetta towards implementation of MIS in their practice however barriers like lack of resources, trained nursing and experienced assistants are hindering factor for adoption of MIS

## CONFLICT OF INTEREST

This study has no conflict of interest to be declared by any author.

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