



WWJMRD 2023; 9(03): 39-44
www.wwjmr.com
International Journal
Peer Reviewed Journal
Refereed Journal
Indexed Journal
Impact Factor SJIF 2017:
5.182 2018: 5.51, (ISI) 2020-
2021: 1.361
E-ISSN: 2454-6615

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Knowledge, Attitude, and Perception of Laparoscopic Surgery among Penultimate and Final Year Medical Students in Nigeria

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Abstract

Background: The advent of minimal access surgery is fast changing the trend of surgery in the past two decades. The benefits, safety, and efficacy of this type of surgery to the patient are enormous and the extent is still being discussed. Laparoscopy surgery requires expertise and its skills acquisition had a long learning curve. Introducing this to the medical school curriculum will enable the medical students to be well acclimatized to the procedure as well as shorten the learning curve before they qualify as specialist medical doctors. This study aimed to assess the knowledge, attitude, perception, and extent of exposure of the penultimate medical students to the minimal access surgery and the need to be added to the medical school curriculum for the clinical class in Nigeria.

Methods: One hundred and eighteen medical students completed the survey across selected universities in South-West (83.1%), North West (14.4%), and North Central (2.5%) in Nigeria. They are from Federal Universities (32.2%), State (63.6%), and private Universities (4.2%). We have more female medical students (51.7%) than male (48.3%), Majority of them were below the age of 25 years with an average age of 24 years and they are currently in 500 levels (68.6%) and 600 levels (31.4%). Respondents were in Obstetrics and Gynaecology Department (60.2%), Medicine and Surgery (27.1%) Paediatrics, Community health, and Psychiatry rotation.

Using a stratified sampling method, self-administered semi-structured questionnaires were distributed online to respondents in different Nigerian Universities from August 2022 to January 2023. Data obtained were analyzed using the Statistical Package for the Social Sciences (SPSS) version 20.0.

Results: Knowledge of laparoscopic surgery among medical students was 94.1% (111). About half of the respondents (53.1%) asserted that laparoscopic surgery services are offered regularly in their hospital. However, the majority are not conversant with the actual cost of the procedure. About 40.7% of medical students have previously participated in or watched a Laparoscopic surgery. A good proportion of these students agreed that Laparoscopic training should be introduced to medical students' school curriculum (91.6%). The topmost reasons they wanted to introduce Laparoscopic surgery training include early exposure to relevant knowledge and skills (94.1%), Promotion of proficiency in minimal access surgery, and world-class standards (70.3%), increased interest in sub-specialties (59.3%) and to improve treatment outcome of patients (50%).

Conclusions: Willingness to accept laparoscopy and inclusion of minimal access surgery training into the medical school curriculum was relatively high among penultimate and final year medical students in Nigeria, hence a high prospect for a laparoscopic surgery practice and more expertise in the field in Nigeria.

Keywords: Attitude, Knowledge, Laparoscopic surgeries, penultimate, final year medical students, Nigeria, Practice, minimal access surgery.

Introduction

Gynecological surgical practice is undergoing a revolution over the last 5 decades in the modalities of surgical techniques from open procedures to laparoscopy and hysteroscopy, with seamlessly similar good outcomes.¹ Though Minimal access surgery(Laparoscopy) had been on the shore of gynecological practice for over five decades, the influence on the fast-changing trend of surgery in the past two decades is enormous and much felt in developing countries by the combined efforts of a few individuals with similar vision and passion to

share the knowledge and improve the expertise so that the patients will benefit maximally in the long run. The benefits, safety, and efficacy of this type of surgery for the patient are enormous.² Laparoscopy can be used for diagnostic and operative gynecological procedures³ and it offers patients potentially shorter hospital stay, reduced intraoperative blood loss, less post-operative pain, faster recuperating, reduced rate of surgical site infection, and fewer chances of adhesion formation^{4,5,6}

Laparoscopy surgery requires expertise and its skills acquisition had a long learning curve.⁷ The technicalities of the laparoscopic surgical procedure after careful case selection has been clearly described by a researcher.⁸ Introducing this to the medical school curriculum will enable the medical students to be well acquainted with the minimal access surgical techniques and as such shortened the learning curve before their qualifications as specialist medical doctors. This study aimed to assess the knowledge, attitude, perception, and extent of exposure of the penultimate medical students to the minimal access surgery and the need to be added to the medical school curriculum and ensure active clinical participation for the medical students' clinical class in Nigeria.

Methods

This study was a cross-sectional descriptive study carried out among penultimate and final year medical students in Federal and State Medical schools in different geopolitical zones in Nigeria and at the Annual Conference of the Nigerian Medical Students' Association NiMSA in September 2022 among the delegates in Penultimate class of different medical schools present who consented to participate consecutively. It was an online survey carried out from August 2022 to January 2023.

The minimum sample size was determined using the formula for the survey developed by Yaro Yamen based on an estimated population of medical students graduating each year in Nigeria estimated to be 3000 obtained from the Nigeria Medical and Dental Council of Nigeria.

$$n = N/1+Ne^2$$

where n is the minimum sample size, N is the total population size (of doctors) and e is desired precision/level

of significance, usually 5% (0.05) at a 95% Confidence Interval (CI). Hence, $n = 3,000/1+3,000 \times (0.05)^2 = 352.9$ being approximately 353. To cater for 10% attrition, we have 10% of 353=35; 353+ 35=388. Thus, about 400 questionnaires were to survey participants.

Sampling technique procedure

All the medical students at the Federal, State, and Private medical schools selected and those at the conference who met the inclusion criteria and gave consent were given self-administered semi-structured online questionnaires with an effort made to avoid double administration. Only 118 completed the form.

One hundred and eighteen medical students were recruited and interviewed across selected universities in South-West (83.1%), North West (14.4%), and North Central (2.5%) in Nigeria.

Data analysis

Information on knowledge, attitude, the extent of the practice of laparoscopic surgery, and factors affecting the attitude of medical students toward laparoscopic surgery was collated and analyzed using the Statistical Package for the Social Sciences (SPSS) version 20.0.

Ethical considerations

The respondents' confidentiality and Helsinki declaration were respected in the conduct of this work.

Results

One hundred and eighteen medical students completed the survey across selected universities in Nigeria. The demographic characteristics of the respondents in table 1 showed that about 63.3% of the respondents were aged less than 29 years and only 8.5% were above 30 years, with an average age of 24 years. We have more female medical students (51.7%) than male (48.3) and they were currently in the 500 level (68.6%) and 600 level (31.4%). Three out of every five students interviewed were in Obstetrics and Gynaecology Department (60.2%), and next to O&G were students from Medicine and Surgery (27.1%).

Table 1: Socio-Demographic Characteristics of Medical Students.

		Frequency (n = 118)	%
Gender	Male	57	48.3
	Female	61	51.7
Age	<25years	75	63.6
	25 - 29years	33	28.0
	30years and above	10	8.5
	Mean ± SD	24.2±2.6	
Academic Level	500level	81	68.6
	600level	37	31.4
Name of Institution	Ahmadu Bello University	17	14.4
	College of Medicine, University of Lagos	3	2.5
	Lagos State University College of Medicine	75	63.6
	The Eko University of Medicine and Health Sciences	5	4.2
	University of Ibadan	15	12.7
	University of Ilorin	3	2.5
Geopolitical zone of Institution	North Central	3	2.5
	North West	17	14.4
	South West	98	83.1
Current Department	Community Medicine	5	4.2
	Medicine and Surgery	32	27.1
	Paediatrics	10	8.4
	Obstetrics and Gynaecology	71	60.2

Table 2: Medical Students' Knowledge of the Laparoscopy Surgery.

		Frequency (n = 118)	%
Heard / Read About Laparoscopic Surgery	Yes	111	94.1
	No	7	5.9
Source of Laparoscopic Surgery awareness	Medical School	107	90.7
	Hospital	37	31.4
	Media	42	35.6
	Books and Journals	34	28.8
	None of the above	3	2.5
Benefits of Laparoscopic Surgery	Faster Recovery	1	0.8
	Less invasive and minimal scar	24	20.3
	Less invasive and minimal scar, Faster recovery	19	16.1
	Less invasive and minimal scar, Less complication, Faster recovery	64	54.2
Challenges of Laparoscopic Surgery	Don't know	10	8.5
	Dare of complications	11	9.3
	Lack of equipment	78	66.1
	Lack of skilled and professional personnel	78	66.1
	Prolonged time	16	13.6
	Very expensive	70	59.3
Laparoscopic Simulation Training Definition	Don't know	18	15.3
	It is a simulated clinical experience that takes place outside of the operating room	24	20.3
	A simulated clinical experience, outside the operating room, provides insight into laparoscopic surgery on life patients	62	52.5
	Provides a strong insight during one of the laparoscopic surgeries on life patients in the operating room	29	24.6
	Genuinely don't know	1	0.8
Benefits of Laparoscopic Simulation Training	Don't know	2	1.7
	It enhances psychomotor and technical skills development	85	72.0
	To perfect skills in simulating tools before practicing on human beings	102	86.4
	It is recommended by the laparoscopic surgeon	32	27.1
	It shortens the learning curve of laparoscopic surgeons in training	61	51.7
	Make me in control	1	0.8
	Skills learned can be transferred to the operating room	80	67.8
	It is only to obtain a certificate of attendance	4	3.4
Others	4	3.4	

A good proportion of medical students interviewed have heard about Laparoscopic surgery (94.1%) while 5.9% of them have not heard about the surgery. The main source of awareness of Laparoscopic surgery among medical students is through Medical Schools (90.7%), other sources are Media (35.6%), Hospitals (31.4%), and Books / Journals (28.8%). More than half of the medical students considered, less invasive and minimal scar, less complication, and faster recovery altogether (54.2%) as a benefit of Laparoscopic surgery, while less invasive and minimal scar only (20.3%) is seen as a benefit by some medical students and less invasive/minimal scar and faster recovery (16.1%) only perceived as a benefit by few of the medical students. Two-thirds of the medical students indicated that the lack of equipment, lack of skilled and professional personnel (66.1%) are the major challenges of

Laparoscopic surgery, other challenges flagged by the students are being expensive (59.3%), prolonged surgical time (13.6%) and 15.3% of them did not know any challenges attached to Laparoscopic surgery. More than half of the students interpreted Laparoscopic simulation training as a simulated clinical experience, outside the operating room, that provides insight into laparoscopic surgery on life patients (52.5%), while a quarter of them defined it as a clinical experience that provides a strong insight during one of the laparoscopic surgeries on live patients in the operating room (24.6%). The top three benefits of Laparoscopic simulation training are; to perfect skills in simulating tools before practicing on human beings (86.4%), It enhances psychomotor and technical skills development (72%) and Skills learned can be transferred to the operating room (67.8%) as shown in Table 2.

Table 3: Medical Students' attitude toward Laparoscopic Surgery.

		Frequency (n = 118)	%
Awareness of Laparoscopic Simulation training	Yes	29	24.6
	No	89	75.4
Attended any training before	Yes	29	24.6
	No	89	75.4
Willingness to use if provided by the Institution	Yes	115	97.5
	No	3	2.5
Introducing Laparoscopic Simulation into the Medical Curriculum	Yes	110	93.2
	No	8	6.8

Previously participated in or watched a Laparoscopy Surgery	Yes	48	40.7
	No	70	59.3
Agreed Laparoscopic training be introduced to Medical Students	Disagree	4	3.4
	Not sure	6	5.1
	Agree	39	33.1
	Strongly agree	69	58.5
Reasons for introducing Laparoscopy Surgery Training	Early exposure to relevant knowledge and skills	111	94.1
	Better treatment outcome	59	50.0
	Increase interest in sub-specialties	70	59.3
	Promote proficiency and world standard	83	70.3
	None	3	2.5
Laparoscopy surgery necessary in the hospital	Yes	104	88.1
	No	8	6.8
	Don't know	6	5.1
Reasons for saying Laparoscopy Surgery is necessary for Nigeria	Provide alternatives	48	40.7
	Opportunity to train doctors	77	65.3
	Enhance effective surgery	68	57.6
	Patient early recovery	43	36.4
	Don't know	15	12.7

Medical students' attitude towards Laparoscopic surgery, table 3 indicated that only a quarter of the students are aware of Laparoscopic simulation training and have attended the training before (24.6%) while 75.4% have never heard or attended training on Laparoscopic simulation.

Almost all the students will be willing to try the Laparoscopic simulation if provided by their institution (97.5%) and 93.2% wished Laparoscopic simulation could be introduced into the medical curriculum. Only 40.7% of medical students have previously participated in or watched a Laparoscopic surgery. A good proportion of these students agreed that Laparoscopic training is introduced to

medical students' curriculum (91.6%). The topmost benefits perceived by medical students, for introducing Laparoscopic surgery training is early exposure to relevant knowledge and skills (94.1%), other reasons are to promote proficiency to world standard (70.3%), to increase interest in sub-specialties (59.3%) and to provide better treatment outcome for patients(50%).

Almost all the respondents considered Laparoscopic surgery to be necessary for Nigerian hospitals and the top three reasons given are, the opportunity to train doctors (65.3%), enhanced effective surgery (57.6%), and providing alternatives to traditional open surgeries. (40.7%).

Table 4: Overall Opinion of Medical Students about the Laparoscopic Surgery.

		Frequency (n = 118)	%
Allow your relative to undergo Laparoscopic surgery in Nigeria	Yes	53	44.9
	No	65	55.1
Reasons for saying that you will not allow your relative to undergo Laparoscopic surgery in Nigeria	Fear of complications	30	46.2
	Fear of cost	35	53.8
	Lack of expertise	23	35.4
Facility for the Laparoscopic Surgery in the Institution	Yes	74	62.7
	No	9	7.6
	Don't know	35	29.7
Number of Laparoscopic Surgeries seen in the past 1 year	None	72	61.0
	One	25	21.2
	Two	13	11.0
	Three	2	1.7
	Four	2	1.7
	Five	1	.8
	Seven	2	1.7
	Ten	1	.8
Common Laparoscopic Surgery seen before	Adhesiolysis	1	0.8
	Appendectomy	16	13.6
	Prostatectomy	8	6.8
	Cholecystectomy	8	6.8
	EUA	1	0.8
	Exploratory laparoscopy	2	1.7
	Laminectomy	1	0.8
	Laparoscopy +dye hydrotubation	2	1.7
	Don't know	13	11.0
	Laparoscopic salpingostomy	17	14.4
	Myomectomy	4	3.4
None	52	44.1	

The average cost of commonly seen Laparoscopic Surgery in your center	51000 - 100000	2	1.7
	101000 - 150000	4	3.4
	151000 - 200000	5	4.2
	201000 - 500000	7	5.9
	>500000	7	5.9
	Don't know	93	78.8
Advantage of Laparoscopic Surgery that will make you prefer it	Less complication	87	73.7
	Less pain after surgery	83	70.3
	Small scar or wound mark	108	91.5
	Early recovery	99	83.9
	Discharge from hospital	99	83.9
	Fear of complications	6	5.1
Reasons for avoiding Laparoscopic Surgery	High cost	26	22.0
	I haven't had a cause to avoid it or not	1	.8
	Lack of experienced surgeons	29	24.6
	All the above	13	11.0
	Others	2	1.7
	None of the above	41	34.7

44.9% of respondents were ready to allow their relatives to undergo Laparoscopic surgery in Nigeria while 55.1% of these students will oppose that due to fear of complications (46.2%) and perceived lack of expertise (35.4%) and expensive cost of surgery (53.8%), Availability of facility for the Laparoscopic surgery in the Institution as affirmed by 62.7% of the medical students, 29.7% of them claimed that they don't know if it's available while 7.6% said that the facilities are not available. Most of these students said that they have not seen any laparoscopic surgeries in the past 1 year while 36.4% of these students have seen between 1 to 5 laparoscopic surgeries in the past year. The most frequent laparoscopic surgeries claimed to have been seen before by medical students are Laparoscopic salpingostomy (14.4%), Appendectomy (13.6%), Prostatectomy (6.8%), and Cholecystectomy (6.8%). Most of these students said that the average cost of commonly seen Laparoscopic Surgery in their center's hovers between 201,000 and 1 million nairas (11.8%). The top five advantages mentioned by medical students that will make them prefer it are; Small scar or wound mark (91.5%), early recovery (83.9%), discharge from the hospital (83.9%), less complication (73.7%) and less pain after surgery (70.3%). While two major reasons for avoiding laparoscopic surgery are the lack of experienced surgeons (24.6%) and high cost (22%).

Discussion

This study aimed to assess the knowledge, attitude, perception, and extent of exposure of the penultimate medical students to the minimal access surgery and the need to be added to the medical school curriculum and ensure active clinical participation for the medical students' clinical class in Nigeria. The Knowledge of laparoscopic surgery among the penultimate and final year medical students in different regions of Nigeria is good, with only about 5.9% not aware of what laparoscopy surgery entails. They are aware of the stream of benefits of laparoscopic surgeries like the faster recovery to patients, minimal scars, short hospital stays, and minimal complications.

With medical school and the hospital of their clinical postings being their sources of information, this showed that most tertiary institutions had laparoscopic surgical equipment and personnel with the expertise to perform the procedures. However, the respondents have highlighted a lack of equipment, lack of skilled and professional

personnel, high cost of surgery, and prolonged intraoperative time as major challenges of laparoscopic surgery. These are similar issues reported by other researchers^{2,5,9} These could have hampered their opportunity for adequate exposure and intensive learning, considering that their training was rotational, and time-bound once the equipment was not in good working condition while they were rotating through the units that offer the laparoscopy services, they may not have had the opportunity to learn such skills again.

Laparoscopic simulation is an alternative means of acquiring minimal access surgery skills in the trainees and equally, perfecting the psychomotor and technical skills transferable to the operating theatre for use on live patients. Unfortunately, most students' knowledge of it was virtual as it wasn't available in almost all Government institutions in Nigeria, but it could be accessed in a few private laparoscopic training centers in Lagos, Enugu, and Port Harcourt. However, they were all enthusiastic and willing to utilize the facility if available in their surgical skills acquisition facilities.

Laparoscopic surgery is demanding and needs various techniques to learn., and be adept at laparoscopic skills thus there is a need to include the laparoscopic surgical training syllabus for medical students¹⁰. In general, laparoscopic surgeries in LIMCs like ours faces a lot of challenges like the high cost of acquiring state-of-the-art equipment, and available laparoscopic surgical skills amongst others as earlier stated. These militate against the training of the younger generation of laparoscopic surgeons¹¹

Awareness and exposure of most medical students to laparoscopic training increased with the advent of laparoscopy training into the post-graduate training program in most teaching hospitals in Nigeria, thus influencing the popularity of the technique. There is still a need to incorporate laboratory skill training among medical students. This would further inoculate not only theoretical knowledge but also initiate the development of skills in laparoscopic surgery early in their career among future surgeons.

In a study by Shirker, laparoscopic training of medical students enhances the appreciation of the anatomy of the human body giving the students a better insight into the internal body organs and also increasing their participation in the theatre¹²

Conclusion

Willingness to accept laparoscopy and inclusion of minimal access surgery simulation training into the medical school curriculum was relatively high among penultimate and final year medical students in Nigeria, hence a high prospect for a laparoscopic surgery practice and more expertise in the field among the young generations of future doctors in Nigeria.

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