Patients and hospital managers want laparoscopic simulation training to become mandatory before live operating: a multicentre qualitative study of stakeholder perceptions

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ABSTRACT

Background Surgical procedures are complex and susceptible to human error. Individual surgical skill correlates with improved patient outcomes demonstrating that surgical proficiency is vitally important for patient safety. Evidence demonstrates that simulation training improves laparoscopic surgical skills; however, projects to implement and integrate laparoscopic simulation into core surgical curricula have had varied success. One barrier to successful implementation has been the lack of awareness and prioritisation of simulation initiatives by key stakeholders.

Objective To determine the knowledge and perceptions of patients and hospital managers on laparoscopic surgery and simulation training in patient safety and healthcare.

Method A qualitative study was conducted in the Southwest of England. 40 semistructured interviews were undertaken with patients attending general gynaecology clinics and general surgical and gynaecology hospital managers.

Results Six key themes identified included: positive expectations of laparoscopic surgery; perceptions of problems and financial implications of laparoscopic surgery; lack of awareness of difficulties with surgical training; desire for laparoscopic simulation training and competency testing for patient benefit; conflicting priorities of laparoscopic simulation in healthcare; and drawbacks of surgical simulation training. Patients and managers were largely unaware of the risks of laparoscopic surgery and challenges for training. Managers highlighted conflicting financial priorities when purchasing educational equipment. Patients stated that they would have greater confidence in a surgeon who had undertaken mandatory surgical simulation training and perceived purchasing simulation equipment to be a high priority in the National Health Services. Most patients and hospital managers believed trainees should pass an examination on a simulator prior to live operating.

Conclusions Competency-based mandatory laparoscopic simulation was strongly supported by the majority of stakeholders to augment the initial learning curve of surgeons.

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INTRODUCTION

Surgical procedures are complex and multifactorial but are particularly susceptible to human error.[1] Current initiatives to improve patient safety in surgery with an emphasis on system approaches, such as optimal antibiotic or heparin use, have had a minimal impact on surgical outcomes.[2] However, it has been shown that peer video ratings of surgical skill strongly correlated with improved patient outcomes.[3] Consequently, there has been growing interest in focusing on the operation itself.

Changes in surgical techniques, including the advent of laparoscopic surgery (LS), have placed additional demands on operating theatres, including a strain on the balance between service delivery and surgical training.[4] The expansion in LS has occurred at a time when hours for surgical training have diminished greatly.[4] With increasing awareness that supervised surgical trainees have worse patient outcomes compared with consultants operating themselves,[5 6] there is a need to address the balance between patient safety and the requirement to train the next generation of laparoscopic surgeons. This is being pursued, in part, by moving basic surgical skills training from the operating theatre on live patients to simulation centres.

There is good evidence that laparoscopic virtual reality (VR) and low fidelity box simulation training improves LS skills, resulting in reduced operation times, improved surgical performance, reduced intraoperating and postoperative complication rates and shorter hospital stay.[7–9] However projects to implement and integrate laparoscopic simulation into core surgical curricula across specialties have had limited and varied success.[10 11]

One barrier to successful implementation has been the variation in motivation of stakeholders,[12] including a lack of awareness and prioritisation of simulation initiatives. A cultural change could be driven by patients and hospital managers who are now in a better position to influence priorities in healthcare. No literature to date examines their opinions on simulation training for surgical trainees. Our study aimed to determine the knowledge and views of both groups on LS and simulation training to help us understand how to shape this cultural change.

METHODS

Study design

Following ethical approval, a qualitative study with thematic analysis was conducted.

Participants, sampling and recruitment

Patients

Purposive consecutive sampling was undertaken.[13] Participants were recruited from general gynaecology clinics at two hospitals in the Southwest of England. All patients in five clinics over the study period were approached in person. The exclusion criteria included: patients under 18 years and lack of mental capacity to consent.

Hospital managers

Homogeneous purposeful sampling was undertaken.[13] All general surgical and gynaecology managers in the former South West Strategic Health Authority were eligible to participate in the study. Hospital managers' contact details were accessed through departmental college tutors as per ethical review recommendations.

All potential participants were given an information leaflet with an explanation of the aims of the study. Participants were given time to understand what the research entailed and the opportunity to ask questions about the study before consenting to participate. Recruitment and interviews took place from February 2013 to January 2014.

Data collection

Prior to conducting the interviews, we created interview guides containing closed and open-ended questions (online supplementary appendix I and II). An independent focus group of non-clinical Patient Advisory Board members informed the development of the questions and guide composition. The interview guide aimed to achieve consistency in the interviews, ensuring that the same general topics were addressed by each of the respondents. The interviews were semistructured to facilitate a free-flowing discussion and to allow unforeseen issues to be raised by the respondents.

The respondents were allowed to choose a convenient date, place and time for the interviews, all of which were conducted by a member of the research team. Interviews took place on National Health Service premises. Each interview started by establishing informed consent simultaneously confirming anonymity and confidentiality of information. With permission, the interviews were digitally audio-recorded. Field notes were made of observations to supplement the transcripts. Recordings were transcribed prior to the data analysis.

Data analysis

An inductive, semantic approach to analysis was taken, using a constant comparative method. Data were analysed after each interview and findings informed topics and questions for subsequent interviews. The data were independently analysed by two researchers using the six-stage thematic approach outlined by Braun and Clarke.[14] Two researchers analysed the results to ensure credibility and transferability of the data. Following in-depth familiarisation with the data, initial codes were generated using NVivo V.10,[15] which were then applied to the data and collated into potential themes. In the next stage, the themes were refined and named. Finally, raw data quotes were selected to illustrate the categories within each theme. Member checks of the analysis were performed to enhance the credibility of the findings.

RESULTS

Participant details

In all, 35 gynaecology patients were approached; 28 patients agreed to participate. The length of these interviews ranged from 15 to 57 min. Twenty managers in 18 hospitals were contacted by email; 12 hospital managers from eight different hospitals agreed to participate. The length of these interviews ranged from 23 to 95 min. The demographics of the participants are shown in table 1.

Table 1 Participant demographics

Demographic factor Patients	
Age (years)	
Mean (range)	48 (19–80)
Ethnicity (%)	
White British	26/28 (93)
African	1/28 (3.5)
Indian	1/28 (3.5)
Profession (%)	
Housewife/homemaker	3/28 (10.7)
Retired	5/28 (18)
Midwife	1/28 (3.5)
Social worker	2/28 (7)
Police	2/28 (7)
School Teacher	2/28 (7)
Pilates teacher	1/28 (3.5)
Beautician	1/28 (3.5)
Project manager	3/28 (10.7)
Accountant	1/28 (3.5)
Mental health worker	1/28 (3.5)
Charity fund raiser	1/28 (3.5)
Cleaner	1/28 (3.5)
Secretary	1/28 (3.5)
Actress	1/28 (3.5)
Not working	2/28 (7)
Previous laparoscopic surgery (%)	
Yes	6/28 (21)
No	22/28 (79)
Hospital managers	
Age (years)	
Mean (range)	44 (33–58)
Gender (%)	
Female	8/12 (66.7)
Male	4/12 (33.3)
Ethnicity (%)	
White British	12/12 (100)
Specialty (%)	
Gynaecology	5/12 (41.6)
General surgery	7/12 (58.3)
Years as a hospital manager	
Mean (range)	4 (2–11)
Previous medical background (%)	
Yes	4/12 (33.3)
No	8/12 (66.7)

Themes identified

Six key themes were identified as described in table 2.

Patients: details of individual themes

Positive expectations of LS

The majority felt positively about LS. There was overwhelming opinion that LS benefits patients in terms of a shorter hospital stay, reduced postoperative pain and improved cosmetic appearance and as such many would personally opt for this approach over an open procedure.

Table 2 Themes of patient and hospital manager perceptions with illustrative quotes

Themes	Patient Categories	Quotes	Hospital managers Categories	Quotes
Positive expectations of LS	**Perceptions of benefits for patients, hospital and social**	'Laparoscopic surgery is far better, I would choose that anytime'. (P1)	**Perception of benefits for patients, hospital and social**	'I would say absolutely yes it benefits the patients; if I was a patient that is what I would want'. (M6.2)
	Perceived fewer complications	'The risks and complications must be less than open surgery'. (P16)	**Perceived fewer complications**	'You are going to have fewer complications and don't have scars across the abdomen'. (M11.5)
			Potential reduced length of stay	'If we reduce length of stay, we can close beds and it stacks up as business case'. (M2.13)
			LS as the future of surgery	'It is efficient and what consultants want to do these days'. (M6.6)
Perceptions of problems and financial implications of LS	**No disadvantages of LS**	'I have not heard of any disadvantages of keyhole surgery'. (P25)	**No disadvantages of LS**	"'I do not think there are any down sides'. (M6.9)
	Conversion to laparotomy	'My main concern is if something goes wrong, how quickly they can open you up'. (P17)	**Conversion to laparotomy**	'I suppose one of the down sides is if it has to go to an open procedure'. (M6 .7)
	Cost/benefit analysis	'Even though the equipment may be more expensive, people are in hospital for a shorter time so you are saving on hospital beds'. (P1)	Need for a skilled surgeon	'Some people are slow and that is bad from a cost perspective'. (M2.52)
	Difficulty in training for LS	'I imagine LS is harder to practice for junior trainees than open surgery'. (P6)	Appropriate patients	'I think it should not be seen as the panacea for everything and every patient'. (M2.10)
	Lack of examination	'My fear is that as you have not been opened up, they can't have a proper look around'. (P9)	**Cost / benefit analysis**	'I do not think there has been a business case written looking at the advantages and disadvantages as oppose to the income and costs; I reserve judgement until I see that'. (M1.15)
			Cost	'It is phenomenal the amount of money we spend on it'. (M2.53)
			Increased theatre time	'Procedures generally take longer in theatre than open procedures'. (M1.22)
			Patient expectations	'You have to get patients expectations right; it can sound like a minor procedure if you do it keyhole whereas actually it can have its own set of complications'. (M3.11)
			Difficulty in training for LS	'I imagine LS is harder to practice for junior trainees than open surgery'. (M9.6)
Lack of awareness of difficulties with surgical training	**Lack of knowledge of how surgeons are trained**	'You just assume a surgeon will be competent when you go down for surgery, it is not something you really think about'. (P2)	**Lack of knowledge of how surgeons are trained**	'It probably does not even cross our minds to be honest how junior doctors are trained'. (M6.18)
			External pressures affecting training	'The tolerance to a training list has changed massively, there is so much scrutiny and pressure on theatre utilisation and profitability'. (M5.23)
			Effect of training on patient safety	'Safety can be compromised when people are learning. With any surgeon doing an operation for the first time, be it open or laparoscopic, the patient is at greater risk'. (M4.16)
			Effect on theatre lists	'From a service perspective we need well trained middle grade registrars so that when the consultant is away they can do the list'. (M2.34)
			Training and theatre efficiency	'Training unfortunately always decreases theatre utilisation'. (M1.30)
Desire for laparoscopic simulation training and competency testing for patient benefit	**Improve training**	'If you can have a go at it on the simulator you will be better when it comes to the real life operation'. (P1)	**Improve training**	'If a simulator helps them move more quickly through their training so they are competent to operate on patients in the absence of their consultant that would be good'. (M2.36)
	Patient safety	'It's better to destroy a computer rather than a person'. (P1)	**Patient safety**	'I think it is a good idea, particularly if it gives people confidence and allows people to make mistakes and learn from them in a way that does not cause harm'. (M5.51)
	Competency testing	'You would feel more confident in your surgeon if you knew they had passed a competency on a simulator first'. (P20)	**Competency testing**	'I think a simulated competency test sounds like a very good idea and I think if I was a patient I would think that it is a very good idea'. (M5.49)
	Simulation in other professions	'I would be happy for a pilot who had completed a simulated competency to fly my plane, it should be the same with surgery'. (P22)		
Conflicting priorities of laparoscopic simulation in healthcare	**Possible financial benefit of simulation**	'It is going to save the NHS a lot of money in the long run if you make operating safer'. (P1)	**Possible financial benefit of simulation**	'We should be spending money on simulators because it financially makes sense'. (M7.55)
	NHS needs to invest in future	'They need to look at long term outcome and long term savings; it is obviously going to be saving money in the future'. (P25)	**NHS needs to invest in future**	'It is a good idea and I think we are really slow at using technology in the NHS to our advantage'. (M4.32)

Continued

Table 2 Continued

Themes	Patient Categories	Quotes	Hospital managers Categories	Quotes
	Possible reduction in litigation	'If something goes wrong when a junior doctor is operating, surely the costs are greater in the long run through litigation'. (P16)	**Possible reduction in litigation**	'It might pay for itself tenfold if it stops a multi-billion pound negligence claim'. (M11.19)
			Trust wide approach to purchasing simulators	'In our difficult financial environment you would want directorates to club together and put in a case'. (M3.30)
Drawbacks of surgical simulation training	Lack of realism	'You may come across a scenario in theatre that you can not reproduce on the simulator'. (P15) 'Not sure it would give the same sensation as real operating'. (P17)	Proving financial benefits	'The impact of laparoscopic simulators is not seen as well as compared to other equipment'. (M1.43)
			Need for mandatory simulation training	'If we are going to invest in it, we need to make sure people are using it'. (M1.65)

*Overlapping categories of patient and manager perceptions in bold.
LS, laparoscopic surgery; NHS, National Health Service.

The social advantages highlighted focused on a quicker recovery leading to a speedier return to work. There was a misperception from some patients that LS is quicker, less expensive and labour intensive compared with open surgery. Some patients found the prospect of LS less anxiety provoking than open surgery (table 2).

Perceptions of problems and financial implications of LS - Most patients envisaged no real disadvantages of LS, irrespective of personal exposure. A few patients expressed apprehension over the possibility of conversion to laparotomy. Few believed LS did not allow a surgeon to examine the abdomen as thoroughly compared with an open approach. Difficulty in training for LS compared with open surgery was seen as a drawback. One patient commented on the financial implications of LS. Although aware that LS equipment is expensive, they perceived this would be offset by the cost of a reduced length of stay (table 2).

Lack of awareness of difficulties with surgical training

All of the patients acknowledged that they knew very little about surgical training, as well as current difficulties with achieving competencies in LS (table 2).

Desire for laparoscopic simulation training and competency testing for patient benefit

Patients acknowledged they knew little about simulation training in healthcare but were aware of simulation training being used by other professions such as the aviation industry, police services and armed forces. Interestingly, some spontaneously compared patient to passenger safety and education in surgery to airline pilots' flight training. They were positive and encouraging about the use of laparoscopic simulators to train junior surgeons in LS recognising the potential benefits in terms of patient safety and efficacy. Patients felt that simulator training to improve basic LS skill would create better-trained surgeons so that errors made in live operating could be by-passed. They perceived operation repetition was required for skill acquisition, which could be easily facilitated by the simulator. Participants generally believed that a test of surgical competency should be introduced and attained before live operating. The view that they would feel more reassured if a surgeon had previously demonstrated such competency on a simulator was commonly expressed (table 2).

Conflicting priorities of laparoscopic simulation in healthcare

Patients largely considered the purchase of laparoscopic simulation equipment as a high priority for the NHS. Four patients believed it was affected by conflicting financial needs of local departments. There were frequent references to the NHS as an organisation needing to invest more money in training and education and for hospital managers to look at 'the bigger picture'. Patients voiced a need to look at new ways of training harnessing modern technology and maintaining flexibility to adapt to emerging developments in education more promptly. Many believed that although initial capital outlay for a laparoscopic simulator might be high, there would be long-term savings if more doctors trained in LS meant more laparoscopic procedures resulting in shorter inpatient stays and greater hospital efficiency. Two patients spontaneously expressed a view that reduction in litigation and associated expenses further supported the use of laparoscopic simulators (table 2).

Drawbacks of surgical simulation training

Lack of realism, resulting in less use by trainees and trainers, emerged as the main perceived disadvantage of simulation training. Patients also commented that simulation should not be the only educational tool used (table 2).

Hospital managers: details of individual themes

Positive expectations of LS

Managers were generally very positive towards LS. They believed LS to be 'the way of the future' and expressed the view that 'it is what patients want'. Most saw clear patient benefits in terms of a shorter inpatient stay, quicker recovery, reduced postoperative pain and superior cosmetic appearance. A small number believed the complication rates for LS were lower compared with open surgery. Furthermore, managers felt hospitals with high-quality LS set-up would attract superior laparoscopic surgeons and make a more desirable institution for investment (table 2).

Perceptions of problems and financial implications of LS

Managers felt the main disadvantage of LS was expense mentioning the price of consumables and increased theatre time. In fact, some felt LS was only cost-effective when undertaken by time-efficient surgeons. There was divided opinion on whether LS was cost-effective overall despite the possible offset from a shorter inpatient stay. A large proportion highlighted the need for further evidence to demonstrate the patient–benefit versus relative cost for LS for each operation (table 2).

One manager concurred with most patients believing there were no real disadvantages to LS. Some managers voiced concern that unrealistic patient expectation was a further difficultly, including the recovery and the possibility of conversion

to laparotomy. The challenges in training for LS compared with open surgery were also frequently recognised as a drawback (table 2).

Lack of awareness of difficulties with surgical training

Most hospital managers accepted they knew little about surgical training, including difficulties with achieving competencies in LS. Those who had some knowledge assumed an old-style apprenticeship model was still undertaken, but they believed this was unsatisfactory for patient safety. Some hospital managers recognised junior doctors were now less experienced than their predecessors, because of working fewer hours. They acknowledged trainee doctors are unable to undertake operating lists in consultant absence and that this has negative financial implications with theatre list cancellations. Some managers commented that training in theatre must be difficult when the focus is directed on efficiency and that in the current litigious climate trainers might be more reluctant for trainees to operate (table 2).

Desire for laparoscopic simulation training and competency testing for patient benefit

The majority of managers were extremely positive and encouraging about the use of laparoscopic simulators to train junior surgeons in LS, for patient confidence, and in terms of potential improvement in safety and efficiency in the operating theatre. Managers were generally of the opinion that traditional surgical training on live patients was expensive and believed training on the simulator could help reduce financial costs and potentially reduce complications. They also perceived that if the simulator could enhance skill acquisition and allow the more rapid development of independent surgeons, this would have a beneficial financial effect as trainees could undertake more solo operating lists. Managers commonly expressed the opinion that they themselves would feel more reassured if a trainee surgeon operating on them had demonstrated surgical competency on a simulator, and perceived service users would feel the same (table 2).

Conflicting priorities of laparoscopic simulation in healthcare

Managers were divided in opinion on the priority of purchasing simulation equipment. Despite being positive about the benefits of simulator training for LS, some perceived finding the capital for the equipment to be a significant challenge. There were, however, frequent references to the NHS as an organisation needing to invest money in training. Some managers acknowledged that although initial capital outlay for a laparoscopic simulator is high, there would be long-term savings if more doctors were competent at LS because increasing usage of a laparoscopic approach and surgical speed would improve patient care and ultimately hospital efficiency. Managers viewed reduction in litigation as another way to mitigate the financial cost of simulators. They balanced the relatively small cost of the simulator against the expense of negligence claims that are more likely to occur with inexperienced surgeons (table 2).

Drawbacks of surgical simulation training

Difficulty in proving financial benefits and finding time for use emerged as potential disadvantages of simulation training. The need for a cultural change within the NHS to adapt to developments in education and embrace new technologies was highlighted. Managers emphasised there was a need to have a Trust-wide approach to buying simulation equipment and to make simulation training mandatory nationally to ensure usage and benefit for investment in the equipment (table 2).

DISCUSSION

Our findings have shown that both patients and hospital managers perceived LS as the way forward and believed it held benefits for both patients and hospitals. Patients recognised very few disadvantages of LS, whereas hospital managers highlighted expense as the main drawback, frequently referring to the financial pressures facing the NHS. There was limited knowledge of junior surgical training by both groups, but it was appreciated that adequate training in LS is difficult to access. Laparoscopic simulation training, with competency-based testing to be achieved prior to live operating, was strongly desired by the majority of participants to improve patient safety. Patients in particular highlighted the need for the NHS to be innovative, visionary and invest money in education.

As there is no existing comparable work, the findings from this multicentre study across a large UK region make a valuable contribution to current knowledge in surgical education and patient safety. The sample was fairly homogeneous in race and ethnicity, but enough repetition took place to be confident in the themes detected. Furthermore, saturation was achieved with no new responses emerging. Qualitative research is a powerful technique for ascertaining the nature and extent of beliefs and attitudes. This study identified themes, which can now be used in further quantitative studies using larger populations taking into consideration racial and ethnic diversity. Interviewing patients and managers on this subject is novel, so an inductive approach was adopted. The interviewer was a clinician in the research team, which could attract criticism. However, using previously agreed and standardised questions to support liberal discussion obtained both negative and positive views towards LS and simulation.

Overall, patient and manager perceptions of the benefits of LS concur with current evidence: less scarring, reduced postoperative stay and quicker recovery.[16 17] The majority of patients also perceived LS to be quicker, cheaper and with fewer complications, compared with open surgery, which opposes the literature.[16] Although not widely recognised by our participants, complications are possibly increased for LS compared with open surgery and also increased for trainee surgeons compared with consultants.[5] Indeed, studies demonstrate that operative times for trainees are 20%–47% longer than for consultants.[18] Furthermore, trainee participation in LS is independently associated with increased intraoperative and postoperative events including infection and venous thromboembolism.[19] Longer operations may be an acceptable trade-off for addressing educational needs and represent increased cost with decreased surgical throughput. Increased operative time itself may lead to poorer outcomes and may be part of the causal pathway for other downstream adverse outcomes when multivariate analysis of major complications is adjusted for operative time.[5] Trainees are however fundamental to the healthcare system both in terms of their current roles within the healthcare team and to supply the future surgeon workforce.

Surgical education is changing from an apprenticeship model that is teacher driven with didactic learning to one that is learner centric and interactive, creating an avenue for new strategies such as simulation training to make surgical practice more efficient and ultimately safer. Although there are many qualities patients believe are important in a surgeon, it is not unsurprising that our participants deemed competency in technical skills as a high priority. It can be argued that operative performance is a result of many factors: theatre, anaesthetist and perioperative team; however, it is clear that a surgeon's skill and performance largely contributes

to patient outcomes. Both patients and managers overwhelmingly favoured laparoscopic simulation as an adjunct to surgical training, and perceived a competency test undertaken prior to live operating could potentially improve patient safety. Adoption of simulation, however, is dependent on the realisation that change from traditional surgical education is required.

Providing unrestricted access to equipment is not effective in motivating trainees to voluntarily undertake simulation-based laparoscopic skills training with lack of available free time reported as the greatest obstacle.[20] Laparoscopic simulation is now mandatory in some surgical curricula, but it remains a controversial issue with lack of standardisation, scheduled time, availability of simulators and appropriately trained educators. Furthermore, defining the level of proficiency can be challenging and has been the focus of discussion in the literature of medical education and testing. There are currently several simulation-based tests for LS worldwide, such as Fundamentals of Laparoscopic Surgery for general surgeons,[21] Laparoscopic Skills Testing and Training for gynaecologists[22] and European Training in Basic Laparoscopic Urological Skills.[23] Recent studies have examined different methods for setting the pass/fail levels in such programmes and demonstrated a wide variety in pass rates, re-enforcing the complexity with setting a competency test.[24]

Some might question the need for managers to understand the clinical and training issues surrounding LS. However, as budget holders for departments and organisations, managers are involved in prioritisation of fund allocation and safety initiatives. Better awareness and understanding by managers of the issues involved might aid the best use of capital. Similar logic applies as the patient's influence into the planning of health services grows. Future research could be undertaken to explore viewpoints of other key stakeholders; trainees already recognise current laparoscopic training as inadequate and support greater use of simulation for surgical training.[25 26]

A strong theme among managers was the cost and financial implications of both LS and simulation training. Certainly, the priority for purchasing simulation equipment was controversial. The price of the simulators can vary from relatively inexpensive low-fidelity box trainers to highly sophisticated VR simulators. Conventional surgical training is also not without expense; thus, the cost of a simulator could be offset against the cost of increased operating times and complication rates of traditional surgical training. While most patients believed that educational equipment should be a top priority, hospital managers, concerned about conflicting financial priorities, did not rate the need as highly. This contradicts the acknowledgement that laparoscopic surgeons need to be time-efficient for patients and hospitals to fully benefit from LS and that simulation training will potentially improve surgeons' competency and efficiency. Simulators could be valuable for trainees and for consultants returning after a period of absence or undertaking revalidation. Clearly, there is a need for a greater understanding of where the balance of benefit lies. Moreover, consideration should be given to the factors influencing motivation to attend training to ensure educational equipment is optimally utilised so that money is well spent.[20]

As improved surgical skill improves patient outcomes, human performance in surgery should be optimised. Ultimately, patient welfare is paramount in surgical training and must be the focus when contemplating using simulation in medical education. Laparoscopic simulation training is known to reduce theatre time for some operations,[27 28] but the impact on mortality and morbidity rates and episode costs remain poorly understood. Research is still necessary to robustly evaluate the impact of simulation training on patient outcomes and healthcare economics. Given time and financial constraints, developing and implementing laparoscopic simulation training programmes into curricula across the UK and worldwide is proving to be a challenge. Work on how to implement simulation training effectively is required taking into account organisational, administrative and logistical perspectives.[28]

CONCLUSION

Mandatory laparoscopic simulation training was strongly supported by our stakeholders to augment the initial learning curve of surgeons. A competency-based simulation assessment prior to operating on patients was similarly advocated. Despite the current financial climate, stakeholders conclude that further investment in surgical education is prerequisite to patient safety, improving surgical competency and minimising operative risk and in ensuring consumer confidence in their clinician.

Contributors JP designed data collection tools; cleaned, analysed and interpreted the data; and drafted and revised the paper. She is guarantor. DS analysed and interpreted the data and revised the draft paper. MJ helped conceive and design the work and revised the draft paper. TD interpreted the data and revised the draft paper. SV interpreted the data and revised the draft paper. CB initiated and implemented the project; developed the concept and design of the work; acquired, analysed and interpreted the data; and drafted and revised the paper.

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