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Original Article

Trainee and trainer experiences and recommendations for plastic surgery training: A qualitative pilot study ☆

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ABSTRACT

Background: The COVID-19 pandemic has compounded existing training issues for plastic surgeons. The issues that exist result from a complex interplay of system, generational and individual factors, and can be hard to tease out by quantitative means. This pilot study aimed to investigate the perceptions of trainees and trainers of plastic surgical training in the UK.

Methods: Ten semi-structured interviews were performed using purposive sampling in a central London plastic surgical unit. These were coded into and discussed in four themes: Medical directives and service demands; Sociocultural norms within plastic surgical training; Equity and access; and Plastic surgery training methods.

Results: This study showed that current plastic surgery training is not optimised for learning or well-being, and that inequities are fostered, to the detriment of the specialty. Investment and planning are required to support our trainers and protect the diversity of our trainee group, with efficient and monitored learning essential to maintain our breadth and competence of practice.

Conclusion: Expanding this work through a broader study could provide valuable information to contribute to the development of future training schemes and curricula within British plastic surgery.

☆ This research has not been presented or submitted elsewhere

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Introduction

There are challenges in delivering competent consultants in the current surgical training environment in the United Kingdom (UK).[1] Trainees are expected to reach comparable competence to their predecessors with reduced training hours, multiple rotations, frequent handovers and the loss of the traditional firm structure, without an upgrade of training methods.[1,2] The ongoing coronavirus disease-2019 (COVID-19) pandemic has further compromised training opportunities, and its impact is likely to reverberate for some years.[2] That the training time lost is not automatically recouped[3] may further compound the reduced experience gained by consultancy, compared with the previous generation of surgeons.

Success in surgical training is a complex interplay of individual characteristics and relationships within a social and cultural context, navigating directives and resource constraints. There is limited literature relating to training in plastic surgery in the UK, and the majority of studies that do exist are quantitative surveys[4] or relate to specific practical aspects of being a surgeon, such as microsurgical training.[5] To the best of our knowledge, there have been no studies performed to determine the perceptions of both trainers and trainees of plastic surgical training in the UK.

The aim of this pilot study was to investigate the perceptions of trainees and trainers of plastic surgical training in the UK. The objectives were to describe perceived ideal plastic surgical training and the experienced impediments to, and opportunities for, its delivery, in general and also specifically within the COVID-19 pandemic.

Materials and methods

A qualitative research design was chosen to explore the experience of plastic surgery training in the UK. Constructivist grounded theory was used, which seeks to understand and explore a process through focus groups or interviews where prior studies do not exist.[6] Purposive sampling was used to identify participants from a single centre plastic surgery department within a central London teaching hospital, with participants chosen to include men and women, a range of seniorities (from core trainee to >10 years' a consultant), trainers and trainees, clinical management and educational positions, training experience in different UK training regions and internationally, flexible working patterns and those with and without families, all of whom had experienced, or were part of, a national surgical training programme. There was no incentive to participate, and informed verbal consent was obtained from all participants before proceeding.

Semi-structured one-on-one interviews were conducted by telephone, aiming for 30 min in length. During the interview, stem questions on objectives 1-3 were asked, with probes to guide the conversation where required (Box 1).

Interviews were recorded, transcribed verbatim (Sonix, Inc. 2020), checked word-by-word, and de-identified prior to data emergent theme analysis.[6] Initial coding consisted of reading the interview transcripts line-by-line to identify overarching ideas. These codes were refined in the subsequent round of focused coding (NVivo software 1.2, QSR International, 1999–2020) and grouped into categories before subsequent theoretical coding based on the patterns and themes within the data.[7]

Results

Ten semi-structured interviews were completed, of mean 25 (range 15–41) min in length. Three participants were female, and there was a range of seniority: one SHO, four registrars, three junior and

Table 1
Theme 1: Medical directives and service demands

Summary of narrative	*Illustrative verbatim quote(s)*
Medical directives, such as the European Working Time Directive (EWTD), were often cited as material aspects of the system shaping the opportunity to train by reducing the total number of hours in training, and compromising longitudinal training relationships through shift work, and short rotations.	"As an old fart looking back now I look at the trainees and they're just not doing the numbers" "One of the real difficulties… is not having enough time with trainees. So if you go back to sort of a master apprentice model, you had enough time with somebody to progress them on"
Although EWTD is about protecting patients and doctors, it was understood to be "about stopping people burning out and being exhausted and quitting", and several participants referred to it being ignored.	"It does lead to a lot of trainees having to come in in their own time"
In addition to the reduced overall number of hours, the intensity of practical exposure was felt to be less, for which "service demands" were largely blamed. These were commitments or tasks with limited perceived educational value, in contrast to commitments given training value, predominantly time in theatre.	"I've always felt that surgery is an apprenticeship where you learn the most when you're under the operating lights. That's the environment where, as surgeons, we learn"
Service commitments were seen to impede the progress of training in two ways, by dilution,	"We've more… protocols to follow that probably decreases the efficiency in terms of how many cases get done per day"
and by displacement of theatre-based, training opportunities by perceptually non-training ones, out of theatre.	"Unless you can get rid of all the service provision that we have to provide, you wouldn't get through the training if it was any shorter"
Service demands were also identified as pressures curtailing the opportunity for consultants to train in theatre, for example, waiting list pressures,	"Obviously waiting list issues mean they're going to need to get through the cases so you can't spend all your time training."
list availability,	"And if you don't give me an operating list a week, which is what's happening now, I'm never going to get my waiting list done and the thing that's going to go is the teaching"
or theatre distribution.	"To give me two flaps and then do one downstairs, and one upstairs… That makes it unsafe for everyone… And so I'm less likely to say let's do a parallel list."
The directives in response to COVID-19 were felt to exacerbate existing issues, through slow turnover: "PPE means that hardly any cases can be done on the lists now", "basically elective shut down except for very specific cases" and consultant-only operating, limiting longitudinal training relationships.	"There is going to be a big push for consultant-only operating, which is going to have a big impact on training. That will ease but, even without Covid, they're pushing for two consultant free flap operations which, however you do it, is probably going to mean trainees do less." "The lack of continuity, I think, is important. At the moment, obviously, there isn't any, which is disastrous"

two senior consultants (>10 years' experience). Six had international fellowship experience and eight had trained in multiple UK regions. Half had young children during training, and one was working from home at the time of the study.

The focussed coding categories were as follows: technical performance (teaching and metrics), non-technical performance (teaching and metrics), trainee and trainer characteristics and the role of technology in training.

The theoretical codes were as follows: medical directives and service demands; sociocultural norms within plastic surgical training; equity and access and plastic surgery training methods.

In the following sections, data from the interviews are summarised and illustrated with verbatim quotes. Where repetition, discourse markers (e.g. 'you know') or filled pauses (e.g. 'er') occurred, or text was removed for succinctness, ellipses were inserted.

Table 1: **Theme 1:** Medical directives and service demands
Theme 2: Sociocultural norms within plastic surgical training
Table 2: *2.1 Attitudes to trainees*
Table 3: *2.2 Attitudes to trainers*

Table 2
2.1 Attitudes to trainees

Summary of narrative	*Illustrative verbatim quote(s)*
There was a consistent belief that the responsibility for getting trained rested with the trainee seeking out "good" opportunities, whether scheduled or not,	"There is a role for the trainee to seek out the best possible opportunities... The training should be equal, but my experience of it is the better trainees always got trained, and the worse ones didn't" "You should come in on weekends and do extra lists and stay late... I feel like whatever successes I had in my training probably came from that level of commitment. And...I'm not unique in doing that. I think pretty much everybody does that"
and avoiding or tolerating "bad" ones.	"I'd try to avoid... the kind of people who drag you along for private list where there's nothing to do and no learning to be had for very little money... you just go, OK, well, this was a waste of time. I'll never come back to this again"
There was a sense that the trainee must earn the right to be trained,	"It's very obvious as consultants who goes the extra, even if those people aren't working for you, because everybody else tells you. And everybody else tells you about the people who just disappear at five on the dot"
and failure to achieve a healthy training relationship impacted disproportionately on the trainee.	"I look at a lot of the ARCPs now and I think a lot of the problems are personality fits, rather than ability. I think that... there's a difference in how people perceive that people should behave"
The more senior consultants referred to the potential for peer learning.	"The average age of the NASA team that ran the moon landing in ground control [and] put two men and a rocket on the moon... was twenty four. I think we tend to treat the juniors like they are school children, and we do not listen to them enough"

Table 4: *2.3 Incentives to train*
Table 5: *2.4 Attitude to work-life balance*
Table 6: *2.5 Teamwork and growth mindset vs. individual and performance mindset*
Theme 3: Equity and access
Table 7: *3.1 Regional differences*
Table 8: *3.2 Work pattern inequality*
Theme 4: Plastic surgery training methods
Table 9: *4.1 Standardising training*

4.2 Optimising training

All participants felt that rather than just being standardised, training should ideally be optimised at the individual level, something currently 'trainee driven'. Various factors were identified which, it was felt, could improve training efficiency (Table 10).

Table 10: Factors felt to optimise training, including longitudinal relationships, teaching methods, immersion, debrief, optimising time in theatre, optimising time out of theatre and trainee engagement.

Potential was expressed to develop the out-of-theatre learning experience (Table 11).

Table 11: Developing the out-of-theatre learning experience, including academic background and opinions, technical skill and remote observational experience.

4.2.7 Trainee engagement was seen as crucial by both trainees and trainers (Table 12).

Table 12: The perceived importance of trainee engagement, academically, and clinically, in optimising learning.

Table 13: *4.3 Non-operative training for surgeons*, including performance and cognitive training, and leadership/teamwork/management training

Table 14: *4.4 Continuing professional development for consultants*

Table 3
2.2 Attitudes to trainers

Summary of narrative	*Illustrative verbatim quote(s)*
All participants felt that surgeons were expected to teach, and that the ability to do it well was largely innate, with limited potential to improve.	"There's an incumbent responsibility on all surgeons to train. But I think some have more of a natural flair for it than others" "There's no amount of courses that you can send those other people to that would make them much better trainers… The ones that are bad at training"
Trainers were felt to have value at the very least to demonstrate procedures, "just in that context", as long as they did not actively undermine trainees.	
There was a mixed opinion of negative training experiences: what they were, and whether they were good or bad. Largely, "learning by humiliation" was felt a thing of the past, though anecdotal examples were still given. Negative experiences usually encompassed perceived failure at a task or a wasted opportunity to learn.	"I think learning by humiliation and toughening up by extensive and brutal negative experiences is not a good thing, because it makes people unhappy, if nothing else, and I don't think that it improves standards. Although I know that that there'll be people who argue the other way"
Having an adequate support structure was considered important in mitigating negative experiences, by prevention, through trainers understanding proficiency and assigning appropriate tasks, and rationalisation when a negative experience did (inevitably, occasionally) occur.	"The mistake would be either that the task was not right for this person or maybe the trainer didn't know this person very well" "Negative experiences are inevitable, but having a robust system that… allows for informal reflection with a mentor or support figure, to help someone…see the benefit, and not to be negatively affected to the extent that it… has a major impact on them, is something that we should strive for"
Feedback was not routinely given to trainers and, while it was felt that there would be benefit to it, "you should be able to hear it… having feedback on your training would be good, I think", there were perceived issues around how it could be delivered and would be received due to "the consultant-God complex"	"It's difficult for trainees to give feedback to consultants because obviously it's never really blinded. So I think it's incumbent on the trainers to assess each other and to have a peer review rather than a trainee review process"

Table 4
2.3 Incentives to train

Summary of narrative	*Illustrative verbatim quote(s)*
The main incentive to train was that you procured juniors to help you. Beyond this and the love of it (where applicable), there were seen to be disincentives, through theatre and waiting list pressure and associated administration (e.g. WBAs).	"There are very few areas of practice where you're not going to be exposed to and reliant on junior team members helping you out. And the deal is that they get something out of it too, they get some teaching or training from you"
It was felt that further incentives or, at least, accommodation of training, were required.	"Maybe you'd have to do like an extra PA or something if you weren't teaching"
There was also not felt to be any accountability for those who did not actively train, even though some thought there should be.	"I hope we don't have characters who aren't willing to train… but, if there are people like that, learning how to deal with it is part of life" "Everyone should be evaluated and if you have bad reviews, you cannot be allowed to train. I'm serious about this. Bad trainers should not have trainees."

Discussion

This is the first study to use qualitative methodology to explore the current experience of plastic surgical training, in general, and during the COVID-19 pandemic. Quantitative studies, such as surveys, have limited capacity to explore the rich complexity and interactions of the individual, social and cultural factors with material constraints and opportunities affecting trainees and trainers. These quali-

Table 5
2.4 Attitude to work-life balance

Summary of narrative	*Illustrative verbatim quote(s)*
Work-life balance was deemed important for clinical performance, and general well-being, by both trainees and consultants.	"Burn out is a real thing... Hopefully, with time, there's an increasing recognition that work-life balance is important to people if you want them to work well in the long term"
However, it was felt that it could be impacted by surgical training,	"It should be maintained because it keeps you psychosocially balanced, but surgical training is intense. And like every other complex science or complex profession, it'll affect your social life"
and that prioritising it over training opportunities may limit progression.	"It shouldn't matter that you have children, but I do think it distracts people"
	"You can't just say, oh, well, in my day I used to do this because we were brought up differently... just the generational gap is an impediment in itself."
	"I would never decry someone at the beginning of the case saying to me, look, sorry, I've got childcare issues...that's absolutely fine, as long as I know in advance. But what I find is not professional is to sort of at the end of the case, where it's been really hard and difficult say, oh by the way, I'm not around for the next three days... if I'd known at the beginning that the responsibility of taking a patient back to theatre will fall on my shoulders if that person is not going be around, I wouldn't give that person the opportunity to do the micro unless I was 100% confident in their ability."
The amount of time required to offset work stresses was seen to relate to the perceived stress of the situation,	"It very much varies on what the stresses of the day job are, and what downtime you need to make up for it"
and the ability to relax required collegiate support.	"I do think you need downtime. And I do think you need people that can cover you"

Table 6
2.5 Teamwork and growth mindset vs. individual and performance mindset

Summary of narrative	*Illustrative verbatim quote(s)*
Teamwork, humility, positivity and enthusiasm were seen as desirable characteristics in trainees and consultants.	"If you're a good team player and you work hard, and you're enthusiastic.... the social network of trainers around you responds to it and you become better trained. You become a better surgeon. The positivity feeds off the positivity in other people. Everybody at the end of the day is struggling. Whatever they may look like on the surface, everybody is a swan with their legs frantically hammering away underneath and a negative person creates negativity around them. So I find that's the most important aspect of being a trainee in anything. Surgery is just what we're talking about"
A growth mindset was also valued.	"You need to be willing to learn, do things, make mistakes and learn from it, not hide from it"
Despite this, the training system was thought to incubate more of a focus on individual performance mindsets and surgical ego, to the detriment of the individual, cohort and department.	"It's not a lack of training or understanding of how to be a team player as much as people feeling more pressure to compete with their colleagues than to work together with them for whatever reason"
	"I think that there is a lot of self-doubt in surgery... We're not very good at... praising our colleagues when they're good. I mean, they have to be fucking fantastic to get any praise from us. We don't often say 'well done' to a standard appendicectomy, do we? Because you just think, well, if you can't you're shit. And that's probably not the best way to go about it"

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Table 6 (*continued*)

Summary of narrative	*Illustrative verbatim quote(s)*
Several participants referred to an almost fervent need for motivation:	"I think you've really got to want to do it. You've really got to want to be good. And then you've got to do whatever it takes to be as good as you want to be… It's not your standard job. A lot of it is self directed"
Though it wasn't deemed essential, a reasonable aptitude for operating was also felt to be an advantage.	"They have to have some kind of technical proficiency. Not everyone can operate. Everyone can be trained to be able to operate, but if you start at a level whereby you only need to be shown things a few times before you get it, you then progress on to the next level and you get a lot more out of your shorter training firms than other people"

Table 7
3.1 Regional differences

Summary of narrative	*Illustrative verbatim quote(s)*
Participants highlighted regional inequity relating to case load and breadth of experience, as well differences in how trainees were progressed.	"We have this deanery system… it creates all these regional variations in the quality of your training. Forget that some places don't have cleft and burns... everybody knows about that.... that's a problem. But in terms of just how you do an ARCP, how you progress from one year to another"
	"Some ARCP processes are really adversarial... really, really adversarial. In fact, every single ARCP in the [*redacted*] pretty much starts off as you failed this year, and you need to spend the next 30 minutes convincing us why we should let you go on to the next year, and they keep a lot of people back. I don't see the standardisation of that. In [*redacted*], everybody gets through. They could do very little and get through to the next year of training, as long as somebody hadn't made a major thing of holding you back"
There were also differences in terms of FRCS preparation and academic resources.	"They have a yearly FRCS, everybody has to do it… I had to sit a mock FRCS when I was an ST3 - it was a fairly harrowing experience…. And you were marked and they put the marks on the wall. They just… they literally ranked you"
	"In [*redacted*] they provide you with online resources for literally everything you could possibly ever encounter… in every exam. These things shouldn't be another battle that you have to go and search out. It's just we're indoctrinated with the idea that you have to spend a vast amount of money on it yourself and it's not that easy to get hold of it."

tative interviews provided an opportunity to deepen our understanding, and to identify over-arching themes, to inform further research.

Theme 1: Medical directives and service demands

Though competence-based training was welcomed in principle, participants described an ongoing reliance on time-based, apprenticeship style learning, without the longitudinal relationships or time required for them to work. Although some aspects of the system were seen as fixed, such as the EWTD, there were other aspects, such as consistent rota allocation, parallel lists and reduction of service commitment which could potentially be optimised by design to facilitate training interactions, and reduce dilution.

An immersive, 'fellowship-style' model was suggested, supported by the literature in increasing the rate of learning curve acquisition to reach the plateau(/expert/autonomous) stage at which the

Table 8
3.2 Work pattern inequality

Summary of narrative	*Illustrative verbatim quote(s)*
There was also inequity in training potential based on the ability to seek opportunities out of scheduled working hours,	"It ties in with what I said before about… when I was a junior and encouraging other juniors to sort of come in on days off and things like that… a lot of people do that, and that may be reflective of the reduced practical opportunities that you're given during your normal working hours as a junior trainee. It definitely varies by location"
or to attend fellowships in different parts of the country or abroad.	"If people want to progress, if they want to get jobs in good places, they need to be doing something extra"
Aesthetic training was an example with regional variation in being formally scheduled.	"In all of the rotations across the country, I think that there should be aesthetic sub blocks when you go and work with a consultant in an aesthetics hospital, because it is a big part of our syllabus"
There was a mixed view of working less than full time, from it not being possible,	"I don't think that surgical training can be delivered part time. The practical part of surgical training is very practice based. If you're not doing it, not seeing it, you're not going to be able to get it"
to favouring certain personality types in directing their training.	"I feel like I would struggle a bit with that because I don't think I have the personality to be like 'I need to do this list'"
There was, however, felt to be welcome progress towards accepting less than full time training.	"I think the general culture shift is in that direction. And I think it's a good thing"

Table 9
4.1 Standardising training

Summary of narrative	*Illustrative verbatim quote(s)*
All felt that the training programme should deliver at least a minimum standard of competence, and that this was not consistently achieved currently.	"I do think it needs to be optimised and assured, because I do think there are people that are doing it that could have been better and probably shouldn't have got through to where they are"
Currently, the main way to standardise training was trainee rotation within and between units, and minimum attendance at "fairly reasonable, usually quite high quality" local and regional teaching.	"Making sure that you train in multiple centres and with multiple consultants… I think that's useful just to make sure that you're getting a sort of a breadth of styles and perspectives. It doesn't ensure high standards, but I think it goes a way to making sure you're not just being exposed to some random maverick and no one else" "In most training units I think there's a good amount of organised, formal local and or regional teaching… Obviously, every now and then it's still flung together…but that's probably the exception rather than the rule"
There was support for a competence-based rather than time-based training model though the latter remained the standard.	"I am a strong believer in competence-based training. Just because somebody has done the time doesn't mean that they're competent to do things on their own" though "I feel like that concept is really only having lip service paid to it and actually our training is just a time served thing"
A major factor hampering the adoption of competence-based training was considered to be a lack of objective markers of competence or performance tracking.	"These WBA things are a total waste of time" "WBAs/ARCPs are a degree of performance tracking... You could say that they're pretty rubbish ones" "Your competencies are being assessed by a handful of consultants and it's highly subjective. There's room for nepotism and… not allowing people to progress because you don't like the cut of their jib" "Your logbook doesn't tell anybody anything other than you were in the operating room. And it can be manipulated. And it *is* manipulated into, you know, what's required, basically"" "360 degree feedback is important… but rarely does it really help because it's either massively adversarial or it's sycophantically good"

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Table 9 (*continued*)

Summary of narrative	*Illustrative verbatim quote(s)*
Improving these was felt to be important to be able to assess training quality. Options to more objectively assess performance were: "video logbooks", the ability to teach a skill: "If they did not get it, they cannot teach it" and feedback where the assessed could not pick the assessors.	"You can take measures to try to optimise it but then you have to… work out if you have optimised it" "I think the one they've introduced now, the one where you have multiple reports probably is the best indicator of your performance… You know, when we were at school, you used to get an end of term report didn't you, and it was probably pretty close to the truth"
There were also concerns that our definition and expectation of competence may need to adapt to reflect the change in training.	"I think people are less well trained. I worry about who's going to be operating on me" "As you decrease the amount of time people spend in training and you work towards a competence model, you do get people who are very good at things but don't necessarily have a breadth to their training or understanding. And that is that's a generational thing. I don't think there's much that we can do about that"
There was support for maintaining breadth in training, however:	"You cannot just be technically good and not be a good doctor and not be able to treat your patient well. So it's difficult to put a timeline on it, but I think that the core and specialty training pattern that we have is fine"
Concerns were raised about the potential for trainees to "dodge" areas of the curriculum.	"You'll have lots of opportunities where people will say 'do you want to do this part of the case'… The vast majority of surgical trainees say yes, but training needs to be pitched at the ones that say no because they can just go through their entire training without doing stuff"
A more robust and reproducible method of planning, tracking and recording trainee learning curves and competence was called for, focussing on "the bad people… the less motivated, the less inclined, the less either academically good or surgically good people" to standardise training, avoid dodging,	
and generate accountability for departments and trainers.	"if they didn't achieve those than there would be some sort of repercussion... it would be fed back. Some sort of responsibility for departments to get trainees trained"
This would ideally require an overarching "moderator", "orchestrating the training" to make sure that trainees got what they needed and made sense of their training opportunities.	"A more tailored approach to what people need and what they're lacking and that kind of thing" "A better balancing of trainees to what's available to train them with" "I don't know whether there's a better way to run that whole kind of mad sudoku of fitting people in where they want to go"

rate of skill decay are reduced.[8] Once in a subsequent immersive 'block', refresher sessions could be introduced at appropriate times for the individual, to maintain their parallel learning curves through the length of training, at approximately 6 months for cognitive and 10 months for technical skills.[8,9]

Theme 2: Sociocultural norms within plastic surgical training

A growth mindset is widely considered important for learning,[10] and was consistently identified as desirable by participants to foster in plastic surgeons at all stages of training. The current 'pressure to compete' for, and earn, training opportunities was felt to promote the opposite, reinforcing sociocultural norms considered unhelpful in terms of well-being, collaboration and ultimate consultant attitude to learning. There was limited awareness of formal cognitive training in skill acquisition, technical performance and stress resilience, recognised tools in other high-performance fields, such

Table 10
Factors felt to optimise training, including: longitudinal relationships, teaching methods, immersion, debrief, optimising time in theatre, optimising time out of theatre and trainee engagement.

Summary of narrative	*Illustrative verbatim quote(s)*
4.2.1 Longitudinal relationships	
All participants felt that longitudinal training relationships for 6-12 months were crucial to facilitated progress and efficient learning.	"Standard mentoring and teaching is very important, but that needs to be much better than it was in the past, [when] you just got on with it a lot of the time. But we need to focus on really watching what people are doing and trying to teach them to get better. Each time you're in the theatre as a consultant or as the trainer, you want to see someone progress" "Anything less than six months, you're only starting to gain that level of confidence in your trainee, and after 12 months… you might run the risk of wasting opportunities to see other things"
4.2.2 Teaching methods	
Graded responsibility was frequently used, with unsupervised operating the ultimate demonstration of proficiency. Pushing yourself and controlled risk taking was seen as an important aspect of learning, ideally incorporating supervision to protect the patient, though this "balance" was seen as difficult to deliver.	"I've noticed with the fellows since I've started that they're not as good as they were when I started. You know, I'm basically in theatre all the time now" "He was pushing himself, pushing, push, push, push, push himself and as a consultant he kept on doing it and consequently learned a lot… we had some other fellows… they got to a level and then they didn't go on from there. They just almost didn't want to take a risk with it. They just wanted to play it safe from there and then they didn't learn anymore" "You need to extend yourself or take the next step, and that needs to be controlled… which will mean mentoring and training,.. But unless you extend yourself, you won't learn, so it's a bit of a balance"
There was support for formalising learning curves and progressive goals, with a mixed view as to whether this should be facilitated, or "directed by the trainee themselves".	"You give them a target and you go and check if it's happened… If you do not check if it's happened or if you haven't given a clear target, nobody knows what's happening… If it didn't happen, you do it again, until it happens - that's the key thing…Every target moves to the next step."
4.2.3 Immersion	
An immersive "fellowship-style" experience was felt most efficient in progressing up a practical and theoretical learning curve. Regular practice was required to "stay on the exponential part of the curve" or "you drop down". Once you reached the plateau, "you could have 11 months of work doing no work at all. And when you came back, you'd be roughly still on the plateau in terms of your skills."	"You don't go all the way back down to where you started. But it's a sort of a two steps forward, one step back, two steps forward, one step back until you reach your fellowship. And then on your fellowship, you get to complete that final bit of your exponential curve and hit the plateau. But realistically, if you concentrated on that one thing for a longer period of time, you would just hit the plateau sooner." "When you're doing trauma… you should be just doing trauma for a six month rotation. You shouldn't be mixing and matching between different things. Compartmentalise our training… and couple it with expectation on us to do theoretical work alongside it"
But the challenges include parallel learning curves and decay: "I don't feel anything like as confident even remembering about it, let alone doing it, as I would have done after six months of an intense block of doing it a few years ago"	"The problem with training is we can't deliver a bunch of surgeons with one skill. We've got to deliver a bunch of surgeons with the whole generic bunch of skills. And so that one curve is actually happening for, you know, fifteen different things simultaneously. You're going up, you're going back. You're going up. You're going back"
4.2.4 Debrief	
Debrief was seen as an overlooked opportunity to consolidate learning opportunities.	"I think most actual training models or teaching models will say that you need to have some kind of debrief at the end of the thing"

(*continued on next page*)

Table 10 (*continued*)

Summary of narrative	*Illustrative verbatim quote(s)*
4.2.5 Optimising time in theatre	
There was a consistent association between training and the operating theatre: ¨Surgery's surgery, so you have to do it" which could be optimised by:	
meaningful supervision,	"The best training is in theatre, but the way to augment that… they need to be pushed"
decreasing other surgeons,	"There were some lists with three registrars assigned to them. No one knew what they were supposed to do and they were kind of making arrangements like I'll do this and that and then the consultant's involved and it just becomes very unstructured"
and trainee focus.	"When they're in, they're in and they are 100% focused. Not kind of….sort of…well, you know, I'm a bit part time when I'm here"
4.2.6 Optimising time outside theatre	
Learning opportunities outside theatre carried less prestige than opportunities in theatre.	"I mean, you come in and you end up doing two people's clinics in a day. It's like triple maths, isn't it?"

Table 11
Developing the out-of-theatre learning experience, including: academic background and opinions, technical skill and remote observational experience.

Summary of narrative	*Illustrative verbatim quote(s)*
4.2.6.1 Academic background and opinions:	
"If you have a case coming up… know the patient… know the anatomy, know the problem, know the options… then you pick more up because you'd have more intelligent discussion about what you're doing". However, "they feel that they don't have time to do the required reading because there's so much else to do"	
4.2.6.2 Technical simulation training	
Simulation experience was seen as valuable at both junior and senior levels.	"if you're doing sport or anything, you would be practising all the time, whereas none of us really practise doing the micro, which is just nonsense"
However, it is not commonly used or valued, hence the following, regarding COVID-19:	"The clinical caseload has just dropped off a cliff. And so from a surgical point of view, there is no operating to be done, and this time is basically useless in terms of practical skills, acquiring new practical skills or refining practical skills"
Simulation training was lent translational value by one consultant:	"If a trainee came to me and said… I've just come out of a lab, I've just done 10 end-to-side anastomoses, I'd like to do the anastomosis in the next case, I'll be like 100% go for it"
4.2.6.3 Remote observational experience	
"A streamed operation… is a training opportunity… It should count as the 'see one'"	
Streamed operations could also enhance longitudinal training.	"I mean, you can always watch things on YouTube as well. But you don't always have…your boss doing it"

Table 12
The perceived importance of trainee engagement, academically, and clinically, in optimising learning.

Summary of narrative	*Illustrative verbatim quote(s)*
4.2.7.1 Academic engagement	
Academically, spaced learning assessments with the potential to be named and shamed were seen as useful,	Annual exams, where "you might be embarrassed in front of your trainers, in front of your peers… Most people at least picked up a book and did something for that"
	"In the States, they have to do exams every year… I think this would be massively valuable to make… those leaps before you come to doing the FRCS"

(*continued on next page*)

Table 12 (*continued*)

Summary of narrative	*Illustrative verbatim quote(s)*
or cyclical modules with formative assessments.	"There should be an expectation that you've watched two or three webinars at home on your own and you've been to one pan Thames on the subject. And you had to have a seminar with five other people where you've been tested on your knowledge in that three month block"
4.2.7.2 Clinical engagement	
Clinical focus was also deemed crucial with an internal component,	"You've got to really commit, knowing that you don't have the opportunity that the previous generation had of… completing their CCT with 10,000 hours at the operating table. We just don't have that. So you need to be totally focused in the time you are here"
and external facilitation.	"Clinical cases, discussion and teaching is, I think, probably the best way to do it"
A team firm was suggested, to help here, to enhance accountability, "personality fit" and consistent contact.	"There're some bosses that you'll work for that'll be difficult and for those ones, you'll make sure everything's done (depending on what you're like) so that you don't get admonished. And some bosses are fairly easy going, and it's quite easy… to let some stuff slide because… the boss doesn't really care that much. But those individual interactions count for slightly less when there's actually three bosses looking at you, and a fellow"

Table 13
4.3 Non-operative training for surgeons, including performance and cognitive training, and leadership/teamwork/management training

Summary of narrative	*Illustrative verbatim quote(s)*
4.3.1 Performance and cognitive training	
Only two participants had any experience of performance coaching or cognitive training, one in preparation for the FRCS, and one as part of a junior leadership programme, otherwise they had just "picked it up on the job"	
It had a mixed reception,	"Most of us wouldn't think of it, or might think it's a bit of a namby pamby thing to do"
however, there was interest in pursuing the idea.	"I'm very for that. Broadly, my feeling is you either know how to do it or you don't currently, as things stand. So that… cognitive side of what are you like under pressure: right now, that's just you, the sum total of your years of experience and the experiences you've had in the operating theatre when things have gone very badly and how you dealt with it. And I think much of that is to do with how you are as a person… And you can correct me as to whether, if you had cognitive training, you are any better when you slice the femoral artery?"
Several participants mentioned important cognitive attributes for trainees: the ability to "perform under pressure", "focus and concentrate," and "resilience".	"Resilience might not quite encompass everything. You've got to be smart. You've got to be capable. You've got to be able to deal with it"
4.3.2 Leadership/teamwork/management training	
Generally, leadership and management ability was felt to be learned "along the way".	"I don't know, really… I mean, as a trainee, I feel as though it's much more important to become a competent surgeon"
Any training received was not felt to apply to clinical experience.	"The facilities are not in place to take any skills that you've learned and… use them"
However, the more senior consultants felt that training would be helpful, particularly with regard to communication.	"We don't really get very good training in that. And I think some of us aren't very good at it either"

Table 14
4.4 Continuing professional development for consultants

Summary of narrative	*Illustrative verbatim quote(s)*
Most expressed that surgical learning should be "lifelong", but felt that this was voluntary and self-directed.	"Once you become a consultant, nobody comes into theatre to check what you're doing and it's all about your decision making. You're a trained surgeon. You should know by that point what to do technically. The more you do, the better you get…. I think there's a role for evaluating your skills every year or so... I think a surgeon should drive it themselves. They might not find that they need to"
The concept of formal peer coaching was thought likely to be unpopular.	"I think people are different to what they were 20, 30 years ago in terms of consultants, but… a lot of people are type A personalities. And… they think they're right and they're doing the right thing… we're not open to criticism a lot"
Though it does exist informally in many departments, in some capacity.	"There is definitely a role. I think the vast majority of us, if you work in departments that function well, undertake that role informally… we work in teams and you will have somebody that you bounce things off. You might have a senior person that you do that with, and you might also have a person at the same level as you"
Formal coaching was thought to be more relevant to junior consultants,	"A lot of the junior consultants will benefit from performance tracking, coaching, those sorts of things, because in the entirety of their practice, they won't hit their plateau. Probably until they're… a consultant for five years"
	"You don't wake up one morning appointed as a junior consultant and suddenly you have… all the tools required.. There's a vast difference between a year 1 consultant and a year 21 consultant… There is no kind of formal way in which you talk to your colleagues or get training and experience from your colleagues but there should be. Absolutely there should be. You know, the idea that you finish your training, that is... not really true, is it? Nobody finishes their training ever, and there isn't a magical cut off point at which you are suddenly capable of dealing with everything that plastic surgery can throw at you"
though the concept of stratified consultancy was not universally popular.	"I think mentorship at a consultant level is really important, and… that is being recognised and reflected, as I'm looking at job descriptions for various consultant jobs in the last year … they make it explicit in in the job description that there's a formal or informal mentorship agreement with senior consultants within the department"
	"Well, that's the way they want to do it. But I'm actually totally opposed to that. For me, it's absolutely vital that when you become a consultant, you're really confident in what you're going to have to do.. I think being trained on the job... I just think it's really bad"

as elite sport, music and aviation,[11,12] with an unmet need in plastic surgery, who experience regular feelings of burnout.[4]

Theme 3: Equity and access

Completing training and securing a desirable consultant appointment was seen to require 'extra' to that achieved in scheduled hours, with obvious resulting inequity and risks for well-being.[12,13] Known regional differences[4] were also highlighted with harnessing technology, and the agility and

Box 1
Pre-designed interview funnel questions with stems and probes

Topics	Stem question	Probe layer 1	Probe layer 2
Ideal surgical training	How would ideal surgical training be delivered?	Practical task learning	
		Academic learning	
		Performance/cognitive training	
		Teamwork training	
		Length of time in total	
		Intensity/timetable	
		Mentorship	
		Ongoing during consultancy	
	How can the quality of training delivery be optimised?	Trainer	Grade
			Teaching style/flexibility
			Interest in teaching
		Monitoring of teaching quality	Trainee assessments
			Trainer selection
			Validation of trainer
			Feedback
		Negative training experiences	Definition
			Impact
			Responsibility
	What characteristics does the ideal surgical trainee have?	Physical capabilities	
		Personality characteristics	
		Learning style	
		Performance characteristics	
Impediments to training		Work/life balance	Time availability
			Dependents (or lack of)
			Hobbies/passions
			Well-being
	What are the current impediments to training?	For this generation of surgeon	
		During COVID-19	
Opportunities for training	What are the current opportunities for training?	For this generation of surgeon	Simulation
		During COVID-19	Diversity
			Technology

collaboration of the national COVID-19 response,[2,4,5] a priority in equalising access to academic and clinical resources, remote training and telementoring.[4,28,29]

Theme 4: Plastic surgery training methods

A need was expressed to improve the 'quality not quantity' of training to successfully deliver training within remunerated and scheduled hours. Suggestions were to limit service provision, create incentives and responsibility for trainers, demand '100% focus' of trainees, and convert undervalued commitments like clinics, ward rounds, simulation sessions and handovers, into educational opportunities. Though it was felt to have little role by the participants, surgical and coaching training principles have been established in the literature, [9,14–16] which could have a role through formal training investment in trainers.

Standardising training was deemed crucial by participants, with optimising individual progress the ideal. Though a successful outcome from training was seen primarily to be technical competence, current methods of assessment and feedback were perceived as subjective and vulnerable to manipulation, as has been reported elsewhere.[15,17] Developing validated and objective outcome measures was a priority, with the potential to track and respond to trainees' stepwise ascent up validated learning curves, overseen by a moderator with the power to shape individuals' training, and potentially incorporate individual career aims and requirements.[15,18]

Strengths and limitations

Participants were limited to one centre; however, the purposive sampling promoted the inclusion of both trainees and trainers with a diverse educational and management background, who had trained in different regions and international centres. Although all participants were at the same institution, the interview discussion related to the participants' entire length of training, not the institution that they were currently working at. However, as a small sample, their opinions and experiences may not reflect those of the rest of the UK or the international readership.

Conclusion

This pilot study elucidated a sense that plastic surgery training is not currently optimised for learning or well-being, and that inequities are fostered. Investment is required to support our trainers and protect the diversity of our trainee group, with efficient learning essential to maintain our breadth and competence of practice. Expanding this work through a broader study could provide valuable information to contribute to the development of future training schemes and curricula within British plastic surgery.

Declaration of Competing Interest

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Ethical approval

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