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When her scalpels get stuck on the sticky floors: a qualitative study based on the experiences of female surgical faculty members in Korea

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Purpose: This study explores the unique experiences and challenges faced by female surgical faculty members in Korea, particularly the transition from resident to faculty and the challenges that follow.
Methods: Fifteen female surgeons from diverse surgical specialties, age groups, and medical institutions across Korea were recruited using snowball sampling. In-depth, semi-structured 1:1 interviews were conducted, recorded, and transcribed. Grounded theory was used to analyze the data, identifying recurring themes.
Results: Four key themes emerged from the interviews: (1) Sticky floors and broken trail ropes: Female surgeons face a harsh, male-dominated environment with scarce resources for career advancement, often excluded from crucial networks. (2) Strategies: To cope with harsh environments, participants employed various strategies, including silent endurance, mobilizing external resources, exerting 'feminine' strength, and learning from the follies of others, or choosing not to use some of them. (3) Triumph and resentment: While participants experienced feelings of self-esteem and self-fulfillment as well as insight and flexibility, many also faced pressures of representation and burnout. (4) Building new resources: Participants sought to provide a system with enhanced transparency and fairness, a new network of support, and mentoring for future generations.
Conclusion: This preliminary research demonstrates that female faculty members have overcome adversity; however, it also reveals that the challenges they face and their responses to them can act as risks that hinder their patient care and overall well-being, jeopardizing sustainability. Both the surgical field and the broader medical community must devote sufficient attention and resources to address this issue.
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Key Words: Medical faculty, Mentoring, Sexism, Work-family balance, Women physicians

INTRODUCTION

Over the past few decades, many women have advanced into the field of surgery. Although men have predominated the surgical world in terms of numbers and culture, that trend is gradually shifting. Such a worldwide trend is also actual in Korea. According to 2021 data, female residents comprise 38.5% [1] of the general surgery department in Korea, where women have been highly scarce and rarely present. In other surgical specialties, the number of female surgeons has also been on the rise despite slowly increasing, and the network of female surgeons is also formally present [1,2].

However, the increase in female residents has not necessarily led to an increased share of females in corresponding leadership positions. In other words, women in academic surgery are still a minority. The unfulfilled expectation that a higher number

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of women entering a specific field will naturally result in an increased proportion of women in leadership positions can be explained by the phenomena of 'sticky floors,' 'glass ceilings,' and 'leaky pipelines.' Numerous societies and institutions are calling attention to this issue to address these disappointing phenomena and implementing systematic efforts accordingly [3-5].

In Korea, however, even the basic statistics related to the issue, such as the total number of female faculty members in surgery and the number of women in leadership positions (e.g., department chairs or executive directors of societies), are not systematically collected. The lack of systematic data collection and organizational efforts to increase the visibility of female faculty members is concerning, as it fails to alert and inspire the next generation. To begin addressing the gender imbalance issue in academic society, it is essential to make concerted efforts.

Meanwhile, a considerable number of international literatures [6-10] have made valuable contributions to addressing this issue. However, they fail to thoroughly investigate the detailed experiences of faculty members during career advancement. This includes examining the transition from surgical resident to faculty member, the decision-making processes involved, and the opportunities for promotion. The challenge arises from the fact that commonly used research methods in the field, such as quantitative research or even focus group interviews, are inadequate for capturing the detailed experiences and perspectives that require the exploration of deeply personal narratives. Considering such a challenge, this issue may have been understood as an agenda more related to a personal choice, unfit to be spoken in the academic or public realm, or not value-adding, even to female physicians. However, effective policy formulation should be grounded not only in the observable phenomenon of inequality but also in a comprehensive understanding of the individual psyches within such adverse environments, the decisions made by each individual, and an in-depth analysis of the underlying mechanisms and rationales of these situations such as the hows and whys. As such, individual stories require exploration using a qualitative method.

Although many literatures employing qualitative methods [11-14] exploring gender issues in surgery focus on trainees, it is significant to understand the experiences of female surgeons who have become faculty members. Retrospectively examining the entire process of becoming a faculty member will serve as a crucial resource for future mentoring, and the research itself will play a pivotal role in increasing the visibility of female faculty members. Moreover, the fact itself that women are still a minority in various leadership positions demonstrates the need to closely assess the challenges ahead even after becoming a female surgical faculty member. This preliminary research attempts to explore the experiences of female surgical faculty, which are areas hardly researched in Korea, through 1:1 interviews.

METHODS

Ethics statement

This research obtained approval from the Institutional Review Board of Dong-A University (No. 2-1040709-AB-N-01-202212-HR-051-04). Informed consent was obtained from all subjects.

Participants recruitment

This study recruited participants across various surgical specialties (general surgery, neurosurgery, orthopedics, surgical parts of gynecology, and cardiothoracic surgery) using a snowball sampling method. Fifteen women surgeons were recruited and classified based on the medical institutions' characteristics to ensure a diversity of perspectives reflecting the different medical environments in Korea. Medical institutions were classified into large tertiary hospitals in Seoul, the so-called "Big 5" (5 participants), teaching hospitals in the greater Seoul area (4 participants), national hospitals in the non-greater Seoul area (3 people), and private hospitals located in the non-greater Seoul area (3 people). Participants were recruited considering the age distribution of the surgical female faculty in real life as well; 2 in their 30s, 7 in their 40s, 4 in their 50s, and 2 in their 60s (Table 1).

Table 1. Participant demographics by surgical specialty and age group

Participant	Specialty	Age group (yr)
A	General surgery	40s
B	General surgery	50s
C	General surgery	50s
D	General surgery	60s
E	General surgery	40s
F	Thoracic and cardiovascular surgery	30s
G	General surgery	40s
H	General surgery	40s
I	General surgery	60s
J	General surgery	50s
K	Orthopedic surgery	40s
L	Gynecology surgery	40s
M	Gynecology surgery	30s
N	Neurosurgery	40s
O	General surgery	50s

To ensure sufficient anonymity, specific details about the medical institution the respondent belongs to and the exact age of the respondent are not provided.

Data collection

The researcher developed a semi-structured interview guide to help the faculty participants unrestrictedly provide their past and current experiences. At the same time, ample freedom was given to the participants to freely provide their opinions and thoughts going beyond the preset questions, making the most out of the 1:1 interview setting. Questionnaires were provided beforehand, but the participants were informed that not all questions needed to be covered and that they could go in-depth only for the questions they would like to answer. Questions covered various points in time from when the participants first started their training in the surgical field (e.g., why they chose surgery, whether they faced any opposition outside or reluctancy inside) and the current challenges they face as well as their future career prospects (e.g., prospects for leadership position). Topics for exploration were comprehensive, covering not only the participant herself but also one's family, female/male colleagues, norms and culture of the institution and professional society, and society overall. A 1:1 interview was conducted in person for all participants for around 1 and a half to 2 hours and was recorded after obtaining the participant's consent. For certain participants, a second interview was conducted online (Zoom program, Zoom Video Communications) or by phone for around 30 minutes to 1 hour. The contents of the second interview were also recorded. All in-person and remote interviews were conducted by the sole researcher of the study (CJK). Participants were asked to reflect on their experiences of becoming faculty members and the subsequent progression of their careers. Specifically, they were encouraged to consider factors such as self, peers, working environments, medical professional groups, and the structure of the society.

The researcher who conducted the interviews was a medical humanities scholar with experience in qualitative research. She had a keen understanding of the research topic as she also had experience trying to become a full-time faculty member for the past few years. This fact was disclosed to the interview participants, but the interview was conducted as neutrally as possible. The research funding required this research to be conducted and published by a single researcher. Faced with such a challenge, the researcher tried to secure the neutrality and rigorousness of the study through consultation. While conducting interviews, anonymized transcripts of the interviews were prepared for consultation from an expert in qualitative study (MB) regarding the suitability and neutrality of the research implementation. 1:1 in-person and remote interviews were recorded, and the audio files were stored on a password-protected, secure institutional server.

Qualitative data analysis

The contents of the first in-person interviews and the second remote interviews were transcribed verbatim and all personal information was removed from the transcripts afterward. Transcripts were coded based on the grounded theory approach by CJK, the sole researcher of the study. According to Glaser and Strauss [15], the goal of grounded theory is defined as the discovery of an explainable theory from the phenomenon. In Korea, no analysis has been made on the environments encountered by female surgical faculty members and how they have counteracted such environments, nor has any theory been established regarding this. Considering this, grounded theory is suitable for the research, which needs to form a theory that has yet to be presented. The grounded theory approach follows 3 analytical stages: (1) open coding stage, where codes are applied to textual data; (2) axial coding stage, when the relations between the open codes are established; and (3) selective coding stage, when the data is organized around a single phenomenon.

Similar to the interview conducting stage, the transcript analysis stage also challenged the researcher in achieving the research goal: neutrality of the interpretation, adoption of diverse perspectives, and guaranteeing transparency. In order to overcome this hurdle, the researcher received help from multiple consultants (YWB and MB). In each stage of the grounded theory, the researcher met with individual consultants multiple times to provide their interpretation during the respective stage and inquiries regarding the appropriateness of the interpretation proposed. Consultants provided answers after having read all the transcripts. The researcher repeatedly read the transcript and finalized the codebook through meetings with the consultant. Recurrent themes were identified after multiple times of coding and quotes suitable to reveal such themes were also selected. Quotes were selected based on the relevance of the themes and then based on the level of conciseness required in the research paper.

RESULTS

Study population

Fifteen participants were all female surgical faculty members from 12 medical institutions. Fourteen participants were currently on the job, working at a tertiary hospital providing resident training, and one had retired from such duties in the hospital. To maintain anonymity, only minimal demographic features of the participants are presented in Table 1.

Four themes and 16 subthemes were identified from the interviews (Table 2). (1) Sticky floor and broken trail ropes: Faculty members stated that a harsh environment exists to prevent female surgeons from career advancement to higher-level positions and/or senior-level positions, while resources aiding such advancement are scarce. Old-fashioned sexism and

Table 2. Themes and subthemes

Theme	Subtheme	Quotation
Sticky floor and broken trail ropes	Old-fashioned sexism	"Too often, the professor senior to me told me, 'You will be the last female staff." I was told that too many times.'" (Respondent L)
	Microaggression	"When I first became a staff, many outpatients I saw would say after listening to my explanation, 'I'm here because you're a woman, and I think you might explain things well.' Then they would also say, 'I will go see a male doctor for surgery.'... And you get a lot of comments like, 'Wow, you're a woman, and you studied so much,' and also like, 'Do you know how to operate?' 'Do you know how to do ultrasounds?'" (Respondent L)
	Exclusion from various types of "rooms"	"We just had a first female senior who reached out to the Z department, wanting to do a subspecialty in Z, and she got refused. The comment she got was that it's too physically demanding for a female and that the facility isn't ready or prepared enough to have a female fellow. It's just a shared on-call room, which is messy, and all the guys go there to smoke, and anybody can sleep in there. Situation-wise, it's just not prepared yet." (Respondent A)
	Invisible women and absence of mentorship	"The professor basically has a very manly stance. It's male chauvinism, so... I mean, he can give me a bit of guidance if I'm having a little bit of trouble in life, but when it comes to this career stuff, he basically thinks it's 'not a woman thing,' and... I'm just a young woman to him. Because the professor is quite older, when a young woman comes over and... it's just cute, and it's not like he will provide mentorship or anything like that." (Respondent D)
	Struggling to strike a work-home balance	"You know, now you're in your late 30s, early 40s. You've got a family, you're busy... A man can go all in and do this and that, but as a woman, you know, you have a lot of other things to worry about." (Respondent E)
Strategies	Silent endurance	"I feel like they [women] have a little bit of overly modesty in them, and I also feel like they're not very good at self-PR because there's an idea that you're not supposed to stand out. I think that's why they're usually so good at writing papers because that's how they can officially stand out." (Respondent C)
	Mobilizing external resources	"The reason why I was able to continue working like this is because I live with my in-laws. So even if I go out 365 days a year, my mother-in-law would take care of the kids... To work in a department with a lot of on-call duties or to be in a faculty like this, I need this kind of full support from my family... And my sister takes care of everything else, just like my mom." (Respondent O)
	Exerting "feminine" strength (or not)	"I've heard stories about maternal love... There was an old man in his mid-70s who was like, 'I felt so warm and fuzzy, like a feeling that I get from my mom,' and he said it so sincerely... Especially because I'm a woman, having physical contact cannot really lead to an issue. With older people, I can hold their hand once and pat them on the back like this once, and that physical contact can be very comforting to them." (Respondent H)
	Learning from the follies of others	"There was a senior surgeon who was exceptionally skilled in surgery, but on the other hand, he wasn't very social, which made things quite difficult for people around him. I remember thinking, 'I should definitely learn from him in terms of surgical skills and knowledge, but I want to avoid the way he made things hard for others.'" (Respondent E)
Triumph and resentment	Self-esteem and self-fulfillment	"There's just a fundamental belief in myself that I've done my best, and I'm satisfied with the outcome...and that it won't be detrimental to the patients I'm seeing...I'm not saying I'm perfect right now, but a sense of pride comes from that." (Respondent B)
	Insight and flexibility	"Anyway, I've got the maturity to be able to handle any change...I can be like, 'Oh, this is nothing', and it's broadened my experience a lot, seeing things that I would never have seen if I'd just stayed here [at a major hospital].'" (Respondent C)
	Pressure of representation	"Both men and women were uncommitted in their work, but it stood out more when it was a woman. That's because women have consistently done well, so people have certain expectations. It's like, 'Women usually perform at this level, so why can't you?' Now that I think about it, it must have been really difficult for those junior female surgeons. ...But the thing is, even though both men and women were at fault for being uncommitted, it was much more noticeable when it came to the women." (Respondent A)
	Burnout	"I didn't even have time to think about that. ... I was on call 365 days a year, and I wasn't thinking about what I would do tomorrow; I was just getting through each day, one at a time. Then, I reached a point where I felt like I couldn't continue anymore. After 2 years, I was given the opportunity to take a sabbatical and go abroad for further study. So, I just left… That was when I experienced burnout." (Respondent I)

Table 2. Continued

Theme	Subtheme	Quotation
Building new resources	Improving the system with enhanced transparency and fairness	"[Discussing the transparent collection and utilization of funding] It is always recorded in the history. In history! ... When I had some authority that came to me, rather than just letting this happen now and saying nothing... You know, if I didn't act then, there would be no other initiation afterward. I felt like that start was really important." (Respondent J)
	New network of support	"So, I lead the women's faculty meeting. During lunch hours, we have lunch together, and then when it's time—we have about 8 or 10 people—somebody goes off to do surgery, and others go off to see outpatient, and we just talk and talk, and they love it." (Respondent G)
	Mentoring	"Female students, I didn't have that [mentoring] back then, so if I can share with them the experiences that I've had, the things that I've done, they can have those experiences, even if it's indirectly. ... I tell the female students in my medical school, the resident doctors, the students, the interns, when they come in, I always tell them to contact me on Kakao Talk if they're interested in surgery or anything like that. I had quite a few of them who actually contacted me." (Respondent O)

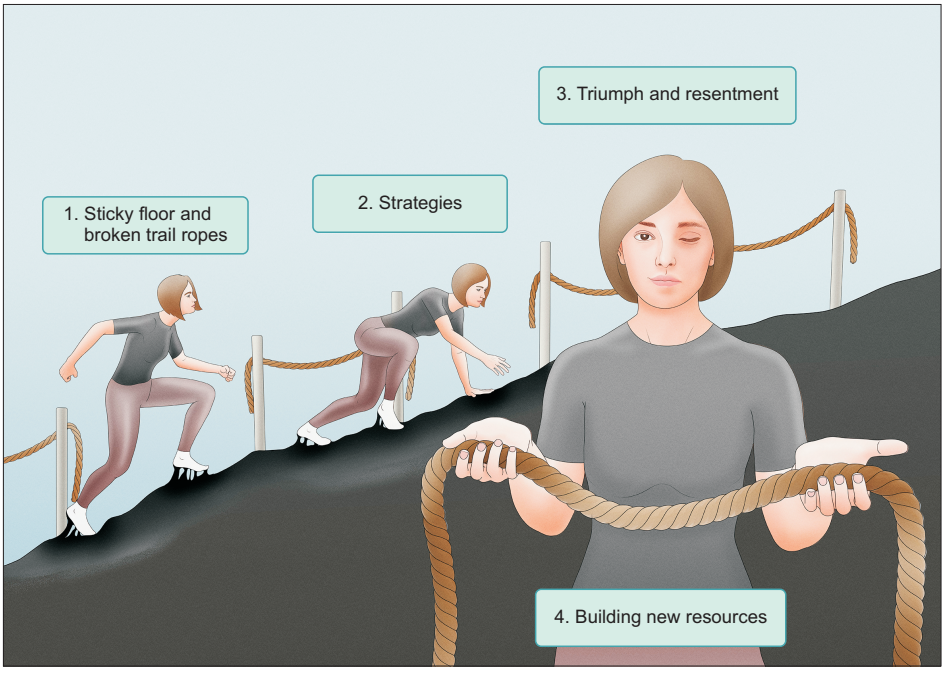

Fig. 1. Theory model of experiences of female surgical faculty members.

microaggression revealed that these female surgeons were still a minority from a gender perspective. As the surgical profession is still heavily dominated by males, faculty members would find themselves excluded from various "rooms," naturally deprived of the resources only available to those inside that room. Invisible women and the absence of mentorship, struggling to strike a work-home balance, showed that they had resources stretched too thin compared to the responsibilities asked of them. (2) Strategies: Multiple common strategies were deployed by participants in order to overcome or endure adverse situations. Strategies such as silent endurance, mobilizing external resources, exerting "feminine" strength (or not), and learning from the follies of others were tactics participants either consciously employed, forced to resort to, or unconsciously used. (3) Triumph and resentment: The unfriendly environment observed in Theme 1 and the strategies depicted in Theme 2 seemed to affect the participants' psychology. Positive feelings and a sense of accomplishment, such as self-esteem and self-fulfillment as well as insight and flexibility were present. At the same time, negative feelings and states also coexisted, such as the pressure of representation and burnout. (4) Building new resources: Participants endeavored to offer resources and support to their colleagues and the next generation, addressing gaps they had previously encountered. A system with enhanced transparency and fairness, a new network of support, and mentoring were observed to be a few of such resources.

The theory established by this research is shown in Fig. 1. First, a woman entering the surgical field experiences sticky

floors and broken trail ropes. Realizing she has only scarce resources to support herself in adverse situations, the female surgeon deploys a strategy to crawl, unable to walk like one's fellow male colleagues. Such environment and strategies impact the psychology of the person, generating both positive and negative states of mind, as seen from the 2-sided face of a person. The resource this woman tries to provide to one's colleagues and the next generation is what she had lacked in her experience, expressed through the image of a hand holding a broken trail rope. The following paragraphs will elaborate on 4 main themes and the 16 subthemes.

Theme 1: Sticky floor and broken trail ropes

Female surgical faculty face various obstacles and experience a shortage of resources while climbing the career ladder from resident to faculty member and a leadership position

Although more women are advancing into the field of surgery, which was once regarded as a "no woman's land," an increased share of women in the surgical field has not necessarily resulted in a more significant portion of women holding positions as faculty members, department chairs, or leadership of academic societies. The phenomenon of a so-called "sticky floor" was witnessed in this study.

Old-fashioned, explicit sexism was a real thing. Gender was a recognized barrier in resident applications not too long ago. One participant recalled a chief resident openly saying these things:

"I noticed they were considering the gender ratio for [resident] application... Quite a few chief residents were very open about it, like, 'I don't like women, I don't like women interns, I don't like women residents.'" (Respondent A)

Such gender inequality was also evident in becoming a faculty member.

"Before the director even met me, because I was a woman, he immediately gave feedback to the person who recommended me, like, 'Are there any men among the referrals?'" (Respondent J)

Meanwhile, microaggressions were prevalent in the experiences of female surgeons, taking the form of silence, disrespect, and depreciation disguised as compliments coming from both peers and patients.

"There's still this thing that when women have something to say, you know, and then people think we're interfering or meddling in... Once, I went to a faculty meeting, and something about education that I was interested in popped up. So, I commented, and you know what the reaction was? They just moved on to the next agenda item, and it was like total bypassing." (Respondent B)

In the third subtheme of exclusion from various types of rooms, room signifies something that goes beyond the physical realm. The room is a space exclusive to specific members, just like a chatroom in a social network service (e.g., Kakao Talk [Kakao Corp.]) which is intangible. Whether there is a physical expression or not, the room symbolizes membership. In instances like not being able to choose a specific subspecialty due to the absence of a night-duty room designated for females, the availability of or access to such rooms can be a determining factor in whether someone can become a member of the group or not. Also, there are resources such as information that are only available to those with access to the room. As female surgeons are the minority, they are often deprived of the opportunity to have rooms exclusive to them. However, male surgeons who take up most of the share would share rooms by themselves and naturally share certain exclusive information inside those closed rooms. Such a phenomenon was seen in the following example:

"I was excluded from the so-called information cartel that was going on between the guys. There was this routine information sharing between the guys... You know, the seniors and juniors [sharing clinical fellow rooms] would share all kinds of information in there. But no one was kind enough to approach me and say, 'Hey, this is what's going on.' They don't share the information with me because that information was not something that can be regarded as honest." (Respondent H)

Participants with child-raising experiences had vivid experiences of struggling to strike a work-home balance. One participant recalls the quote below as a very hurtful moment when her kid said:

"You have to sacrifice yourself because there's nothing institutionalized. What broke my heart the most was that my oldest kid said to me 'Mom, you may have been successful as a professional, but as a mom, you score zero points.'" (Respondent O)

The fact that there are few or no female seniors who can serve as a reference means that these female surgeons do not have access to resources who could give advice on their challenges and are unable to expect an opportunity to advance into a senior leader position.

"We don't have a lot of female seniors. I've never seen a female professor or a female surgeon in medical school, so I never dreamed of it." (Respondent E)

Theme 2: Strategies

Encountered with such challenges, the female surgical faculty and potential candidates employ various strategies

The participants' strategies can be classified into 4 groups: silent endurance; mobilizing external resources; exerting "feminine" strength (or not), learning from the follies of others. Although the research uses the term "strategies," this does not mean that the participants consciously selected every strategy. Sometimes, participants unconsciously resorted to strategies they were permitted or accustomed to using, while certain strategies were employed out of necessity, given their circumstances.

One reason the participants used silent endurance was that they tended to refrain from making demands to avoid being labeled "whiny."

"It's become a habit that I don't talk about minor discomforts and things like that...I'm like, if I tell someone, would they listen to me? They'll probably say that I'm complaining? [After using the facility of the respondent's usual operating room, a male professor said] 'How do you operate there all day?' I said, 'Why?' and he said, 'I've been there only half a day, and my shoulder is out.' And I was like laughing out saying, 'If you—185cm tall—say that, what would I be like—only 163cm tall?'" (Respondent L)

Moreover, silence was used not only in adverse but also in favorable circumstances, perhaps due to the perception that showcasing one's achievements is deemed inappropriate behavior for a woman. Such behavioral expectations and the social norms behind them act as barriers to career advancement for female professionals.

"'No, it's not because I did a good job, it's because you helped me.' This is what I would say usually… I thought that was humility and I thought humility was a virtue. However, when I am around guys at academic societies, it's more about boasting about yourself than showing humility." (Respondent H)

Entrusted with heavy roles and responsibilities, participants leaned on mobilizing external resources, particularly in child-rearing. They could only ascend to faculty positions or secure enough time to establish their position as faculty with the backing of external resources acting as secondary or even primary caregivers in child-rearing.

"If I look at my juniors these days, it seems that even now, when a child is born, the woman's side tends to take on the child-rearing. Even after 20 years, it seems like not much has changed. Back then, my parents were fully involved, providing full-time support in raising the kids." (Respondent N)

When it came to "feminine" strength, participants held strikingly different viewpoints and different strategies were employed accordingly. The "woman's hand," known as one of the valuable qualities of an excellent surgeon, was mentioned multiple times by different participants as a forte of a female surgeon and a symbol of delicacy.

"I think women are more delicate. You know, we have that saying, 'Eagle's Eye, Lion's Heart, and Woman's Hand.' That means, there are definitely things that women can be good at, like delicacy." (Respondent I)

However, when one thinks about the 3 conditions—the eyes of an eagle, the heart of a lion, and the hands of a woman—it is clear that they refer to a time when women could not be surgeons in the same way that eagles and lions could not be. The eagle, the lion, and the woman are just beings called upon to convey a message to the *male* surgeons. In the same line, one participant opposed demanding a delicate quality of women.

"Patients are like... they keep talking about being delicate, although it depends on [surgeon's] personality… Actually, it's not like they think we [women surgeons]'re delicate; it's more like a self-comforting thought. She's not a male doctor, so she at least will have that part [delicacy] ... [how do I feel about it?] It is usually anger. Usually anger. Did you help me in any way? Something like that." (Respondent C)

The last strategy observed is to learn from the follies of others. Women surgeons may use this strategy more often because they often do not have mentors and, to some extent, view their peers and work with an outsider's eye.

"I just do it differently…When I look at them, there may be parts that are slightly frustrating, so I would do it differently. They may not really listen to other people and only talk in their inner circle, so I try to bring in people from the outer circle as much as possible." (Respondent J)

Theme 3: Triumph and resentment

Both external environments and deployed strategies have negative and positive impacts on the psyche of female surgeons

An old saying, "Nothing comes free in life," captures what the participants have accomplished and what they had to sacrifice. The irony is that the adverse environment these participants navigated, a sticky floor and broken trail, eventually led them to exceed expectations and achieve success that one can take pride in. However, it is crucial not to overlook that not only the harsh environment but also the strategies employed, though seemingly successful at the time, inflicted considerable pain and necessitated sacrifices while leading to accomplishments.

Participants showed pride in their professional capacity and also goodwill, which took the form of self-satisfaction and self-esteem. Such a mentality can be understood in that they had to overcome many obstacles to arrive at the current stage, revisit their motives, and return to the beginner's mindset on a continued basis while navigating through challenges.

"As a surgeon, I see myself as someone who truly cares about the patient and has the skills. As a professor, I see myself as someone who is genuinely there for the students and the residents to educate them—not just to teach some knowledge, but to mentor them in a way... I view myself as just someone who hasn't failed in my role as a surgical professor." (Respondent I)

Insight and flexibility were other positive traits found in the participants. Due to their gender, participants were not regarded as the most desirable members in their professional circles, which often led to their assignment to positions considered least favorable within the group. Or, sometimes they feel that they do not fully belong to their group. However, paradoxically, this situation gave them the advantage of insight and flexibility.

"I think I'm a little bit less stuck up. I'm more open to change and stuff like that. It's a very closed group here at A institution.

... but I'm just like, 'I don't think that's the right way to do it.' ... I think it's a good thing that I've been to a lot of different places, rather than people who've only been in one place. [Otherwise], it's just frogs in a well." (Respondent K)

Nevertheless, there was also a negative mentality that the participants had to bear, with pressure of representation being one aspect. In situations where women are in the minority, each individual's presence carries more weight, leading to a feeling of heightened responsibility, which is sometimes too much. This burden sometimes became overwhelming for the participants. One participant shared an experience where she found it challenging to quit resident training in fear that her decision would be perceived as representing all potential female residents, despite that she wished to do so due to a mistake made by a senior resident.

"When your senior doesn't supervise the situation closely, people can end up dying. And this was the hardest part. Someone had died...and I was so pissed off that day that I said I can't do this anymore. After saying that, I just went home. But… I was afraid that if I quit, they'd say, 'Women can't do surgery anymore.'" (Respondent D)

Considering all these circumstances, burnout may be inevitable. Emotional draining and problems in sleeping were everyday experiences that many participants related to, both from the past and present. Moreover, women surgeons' belief in meritocracy and their strong will to prove themselves with their excellent outcomes leads them to burnout, as seen from the following quote:

"I had already burned myself out, so I don't know. I kept asking myself, should I keep doing this? It's hard to say that I'm not burned out, but ultimately, you've proven yourself if you have good outcomes. So, at the end of the day, it's all about the outcome, I think." (Respondent F)

Theme 4: Building new resources

Females who succeed in becoming surgical faculty members attempt to provide resources to their colleagues and the next generation that they could not enjoy in their experience

As mentioned in the insight and flexibility of Theme 3, female surgeons are acutely aware of their challenges and hardships in less powerful positions. Consequently, when they feel they have ascended the ranks enough to exert influence or effect change, they strive to make the surgical field more open and fairer for more female and male residents by attempting to change the system. In other words, they "never underestimate the ability to change things [16]." Such actions not only directly support those advocating for systemic change but also positively influence the entire community by fostering sustainability. Moreover, the respondents took pride in facilitating such change, overcoming the sense of powerlessness they once felt.

"But when I became the chair of department... I got rid of the forced drinking culture... I got rid of that, and now we have a lot of female members in the surgery department and a lot of female faculty members... It takes a little bit of a policy push from somebody higher up to change the status quo." (Respondent O)

Building a supportive network of women was also a way to build resources. It was clear that such a community provided emotional support for female surgeons navigating challenges.

"We simply listen to each other when going through one's own ups and downs. When listening to others we give support, emotional support and say, 'Hey, you did this well, you didn't do anything wrong.' Sometimes, I'm the most senior one and when I tell them, 'Hey, this happened to me, and I did this,' some of the juniors say to me, 'You don't have to even get bothered by that.'" (Respondent H)

However, there was also a noticeable fear of gaining visibility, which indicates that female surgeons still feel vulnerable to potential aggression or threats, even after becoming faculty members.

"That you get strengthened by a particular network?... It's still a little bit cautious to exhibit that in a male-dominated society…We would say, 'Let's go out to dine together separately,' but we never do that under a certain naming." (Respondent E)

The fear of visibility can hinder efforts to address the absence of mentoring, a longstanding issue among female surgeons. Individual respondents expressed a desire to mentor juniors, especially female colleagues, as demonstrated by the following examples:

"It's a little bit of a responsibility. I feel, like, I've got to tell younger friends these stories and that it's time for me to do this." (Respondent A)

However, addressing the gender imbalance in senior surgical positions requires more than individual efforts. Systemic issues must be tackled with comprehensive approaches that enhance female visibility. Therefore, significant attention and support are essential to make meaningful progress.

DISCUSSION

The themes outlined above illustrate the journey of respondents becoming surgical faculty members and advancing in their careers. This process is depicted in Fig. 1. As they enter the surgical field, female residents encounter obstacles such as gender bias, which make it difficult to progress beyond a metaphorical "sticky floor." Advancing to a higher career position, such as becoming a faculty member in this field, is a significant challenge, especially when support like mentoring, equally shared child-rearing responsibilities, and enabling public service are lacking. It feels like navigating a difficult hiking trail with only broken ropes for guidance. Despite these challenges, they must deploy strategies tailored to their circumstances

to achieve their goals. Their choices can be likened to a woman determinedly crawling up a sticky floor. Triumph and resentment are experienced by those who became surgical faculty, depicted as a 2-sided face with smiles and contorted expressions simultaneously. Enduring adverse and unfair external circumstances, along with the strategies deployed, leads to a mix of positive and negative mental states. The willingness to provide resources they once lacked to the next generation is symbolized by extending a hand with a whole trail rope, which had been broken during their experiences.

Their situations demonstrated various obstacles and the absence of a supporting system. While overt gender discrimination may have decreased due to improvements in the legal framework, microaggression is still present, reportedly continuing to cause confusion, self-doubt, and a sense of alienation among minority groups [12,17,18]. This study confirmed that explicit gender discrimination was prevalent in the recent past, which undoubtedly acted as a significant barrier for females entering the surgical field. Moreover, it cannot be asserted that such barriers have been completely eradicated in the present day. Recent research conducted in South Korea shows that female surgeons are more likely to experience gender discrimination across all categories compared to their male counterparts [19]. Therefore, evaluations and actions are necessary for each area. Meanwhile, microaggressions took various forms, including silence and expressions implying female inferiority [20,21], eventually causing mental stress among the respondents. These were all observed in this study.

Given that the respondents volunteered to participate in the study, it can be inferred that they had already contemplated the gender issues. On the other hand, female trainees or faculty members who have not deeply reflected on this issue may experience more confusion, self-doubt, and exhaustion as a result. Exclusion from spaces that hold both physical and symbolic significance—'rooms'—deprives individuals of resources circulated exclusively within those spaces and may also deny them a sense of belonging. For surgeons, access to rooms like scrub room or staff lounge is essential before entering operating rooms or during breaks. This highlights the importance of having a space to physically and symbolically position oneself. Denial of such needs or requests can lead to a feeling of one's legitimate existence as a surgeon being undermined. The legitimacy of one's existence can also be partially denied or questioned in the absence of senior female surgical faculty. These challenges will persist unless systemic efforts are made to ensure that the underrepresented group is "seen, heard, and valued [22]."

The challenges faced by female surgeons extend beyond the workplace. Society places a significantly higher standard on motherhood than fatherhood, demanding a greater commitment. Therefore, it is a tremendous challenge for a female individual to be a surgical faculty member, raise a family, and fulfill the role of a mother at the same time. The findings from this study resonate with previous research, indicating that female surgeons bear a disproportionately greater burden during marriage, childbirth, and child-rearing [23]. These findings should be taken seriously, alongside troubling statistics showing that female physicians experience higher rates of burnout compared to their male counterparts [24,25], and that the suicide mortality ratio for female physicians is higher than that of women in the general population [26].

The strength of this study lies in its somewhat detailed account of the strategies employed by the participants and the subsequent outcomes of these strategies. While reasonable, given their circumstances, the strategies used by the participants inherently involved sacrifices, which shows the limitation of relying solely on individual efforts without instituting systemic change, as such an approach cannot be effective nor sustainable. As evidenced in the study by Barnes et al. [27], participants frequently expend excessive psychological energy in their efforts to adapt, as demonstrated by their attempts to avoid being perceived as complaining, weak, or unsuccessful. Moreover, many previous studies highlight that female professionals tend to overcompensate and are reluctant to see themselves as victims of the system. As a result, they tend to attribute their success and failure to individual abilities rather than systematic bias [17,27,28]. This study also confirmed this finding. Participants also exhibited a natural reluctance to showcase their achievements. To counteract such a tendency, international literature has pointed out the need for efforts to enhance the visibility of female faculty within their home institutions and to improve their negotiation skills [3]. Such educational interventions will likely bring positive outcomes when accompanied by a broader cultural shift within the community.

Women in society generally shoulder a larger share of domestic responsibilities compared to men, with such disparity evident in the medical profession as well [23,29]. Consequently, female surgeons often must navigate these challenges by mobilizing their external resources. To no surprise, these external resources also typically involve other women, such as their mothers, mothers-in-law, sisters, or hired babysitters. In these circumstances, establishing a platform for surgeons of both genders to openly discuss the complexities of balancing caregiving responsibilities and to share strategies for handling such difficulties could be valuable support to some extent. While not all issues can be resolved through discussion alone, such conversations could serve as foundational data for future policy development.

It is unsurprising to see contrasting opinions from the participants concerning the so-called "feminine" attributes of surgeons, as "leaving gender at the door [21]" itself is a subtle form of microaggression. Patient care that is focused

on delicacy and effective communication embodies virtues aligned with the fundamental goals of medicine, namely, aiding patient recovery and promoting healing. However, given the longstanding history of male-dominated societies devaluing these "feminine" qualities and linking them to lesser compensation and recognition, it is understandable that some participants preferred not to be associated with such virtues.

A community engaged in a particular practice shares a standard of excellence and uses this standard to determine what constitutes virtue. In patient care, this involves providing attentive care that prioritizes the patient's well-being, guided by both the patient's medical needs and personal values. Surgeons who demonstrate exceptional achievement are undoubtedly those who excel in providing such attentive care. Often, female surgeons, who may be better positioned to exhibit so-called "feminine" virtues, are the ones delivering this level of care, achieving the goals of medicine more effectively. This is supported by both anecdotal evidence among surgeons and recent empirical studies [30]. Given this context, the absence of female surgeon role models and the insufficient recognition of "feminine" virtues are particularly concerning. These virtues, critical for delivering high-quality patient care, may not be effectively replicated or cultivated within the surgical community. The surgical community must make a conscious effort to continually empower female role models and accord "feminine" qualities the recognition they merit, not only to advance gender equality but also to fulfill the overarching goal of patient care.

Clearly, addressing structural issues through individual efforts alone carries limitations. The observed simultaneous experience of positive accomplishment, along with the pressures of representation and the risk of burnout among female faculty members, raises concerns about the long-term sustainability of their roles. Are women surgeons, who heal the sick, being treated fairly by society? What interventions then are necessary to ensure these female surgical faculty members receive just treatment and, in doing so, enable them to make their professional and personal lives sustainable? It is necessary to highlight their strategies used to attain faculty positions, secure promotions, and achieve excellence in the surgical field while also revealing the limitations and challenges of such strategies. The study participants clearly intended to improve the system whenever the opportunity arose and also recognized the importance of female networking and mentoring. However, this intent should not be confined to opportunistic individual efforts; it must be actualized through a systematic approach by the surgical or broader medical community as a whole. Only through such an approach can we draw the professional community's attention to structural issues that were once considered minor problems requiring individual effort and begin devising effective solutions. By addressing these challenges collectively, the noble endeavor of treating and healing patients can be made truly sustainable.

This study was conducted with 15 participants recruited with a snowball sampling method. Those who willingly participated are likely individuals who recognize the importance of a study focused exclusively on *female* surgical faculty or, at the very least, are not strongly opposed to it. Accordingly, most participants were likely already conscious of gender issues both in society at large and within the surgical profession. Therefore, the perceptions and awareness of the issues highlighted in this study may not be generalizable to the broader population of female surgical faculty members. Nevertheless, this does not diminish the real experience of surgical faculty shared by the participants in the qualitative study, nor does it undermine the legitimacy of the call for improvements within the surgical field.

Another limitation of this study is the lack of analysis on generational differences. Given the rapid increase in the number of female surgeons entering the field, generational differences are likely significant. Some respondents were the first or only female members in their surgical department, which is a very different experience compared to the training and working environments of young participants. While this study did not explore the issue of token representation and the dynamics of female surgeons across different generations, they remain as important topics requiring further investigation. In conclusion, this study marks the first step in deeply exploring the unique challenges faced by female faculty members in the Korean surgical field, as well as their strategies for overcoming them and the institutional advancements needed in the future, all through their personal narratives. This research may serve as a foundation for broader changes across the medical community. Despite its limitations, this study holds the distinction of being the first to explore the lives of female faculty members in Korea through qualitative research.

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Conflict of interest

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All work was done by CJK.

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