

BMJ Open Obligation or getaway? A qualitative inquiry into medical professionalism under COVID-19 among medical students and new physicians in a Taiwan hospital

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ABSTRACT

Objectives During the COVID-19 outbreak, medical educators' main concern has been how to prepare new physicians and medical students to meet their obligations as healthcare providers under novel circumstances. This study aims at exploring how trainees perceive their commitments as physicians under the threat of a pandemic.

Design A qualitative method was employed. Researchers interviewed medical students under clerkship training (fifth and sixth-year medical students) and new physicians undergoing postgraduate year (PGY) and specialty training. **Setting** A university hospital in Taipei, Taiwan.

Participants The team conducted three focus groups for participants in three separate training stages: clerks, PGY students (PGYs), and residents. Researchers collected data from 31 March to 2 April 2020 and analysed the thematic analysis results.

Results Seventeen medical students and new physicians took part in the focus groups, five of whom (31.25%) were female. Participants consisted of four residents, six PGYs, and seven medical students. Through their responses, the authors determined four major dimensions with corresponding subdimensions that significantly affected their sense of medical professionalism, including medical knowledge and clinical skills, sense of duty towards public health, teamwork and protection of patient rights.

Conclusions We therefore concluded that participants grew to accept their roles after acquiring the knowledge and skills needed to care for patients with COVID-19. Alternative teaching arrangements and their impact on trainees' clinical performance require further discussion.

INTRODUCTION

The 2003 outbreak of severe acute respiratory syndrome (SARS) in Taiwan caused fear of the virus among the general public due to its novelty and high fatality rate, and led to widespread discussion of misconduct by physicians, especially those who left quarantine or refused to care for suspected patients with SARS.^{1 2} A few new physicians

STRENGTHS AND LIMITATIONS OF THIS STUDY

- ⇒ Qualitative study design supplies in-depth view of how inexperienced practitioners perceive their obligations as physicians.
- ⇒ Focus groups encourage rich discussion between participants and reflection on other participants' observations and experiences.
- ⇒ Purposive sampling might create a bias towards more active and conscientious participants.

and medical staff suffered or quit after being infected by SARS while caring for patients.² These incidents provoked lasting discussions about healthcare during an epidemic, particularly care protocol for medical students and new physicians with less clinical experience, dilemmas regarding physicians' obligations towards patients and discrimination against medical staff.³⁻⁵

After learning from the SARS outbreak, government agencies and hospitals in Taiwan took pains to prepare in advance for potential future pandemics. More than a decade later, they received their next challenge, when the government at the end of 2019 was alerted to the threat of a novel coronavirus from Wuhan, China, leading it to declare its highest threat level. Hospitals on the front lines of the pandemic enacted measures to prevent intrahospital infection while simultaneously administering regular care and securing staff safety. Medical students and new physicians are inexperienced in clinical care and are therefore more vulnerable, potentially making them vectors for the spread of the virus as they move between different departments caring for patients. Therefore, care protocol designed especially for medical students and new physicians is crucial.

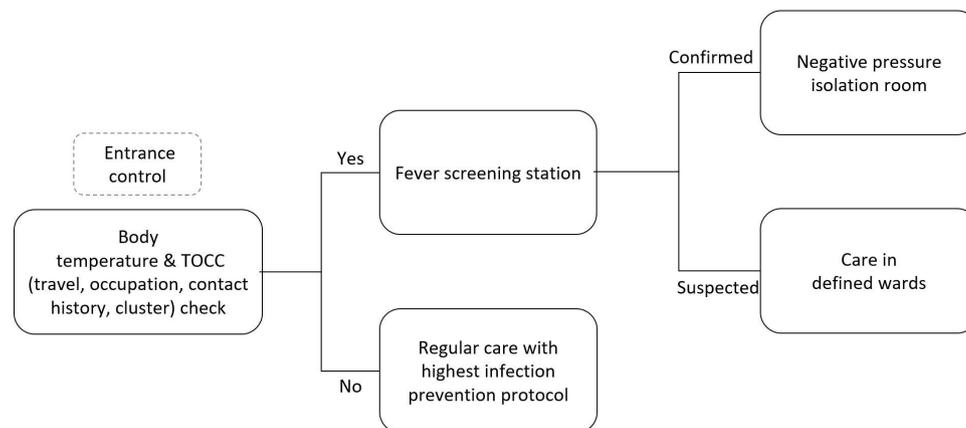


Figure 1 Patient flow at Taipei Medical University Hospital.

Although trainees were not allowed to provide direct care to patients with COVID-19 at the time of the study, they were still expected to prepare in case they needed to take over for front-line health providers. Considering these conditions, we were interested in investigating how new physicians responded to their expected obligations under the novel circumstances of a pandemic.

The first case of COVID-19 in Taiwan was identified on 21 January 2020.⁶ Thanks to the government's strict border controls, by the end of May 2020, the number of confirmed cases had only reached 117, with no sign of community transmission.⁷ The government, hospitals and citizens all played their part in preventing an outbreak. For example, Taipei Medical University Hospital (TMUH) at the end of 2019 adjusted its patient care protocol as follows: (1) sufficient and high-quality protective gear must be supplied to all staff, including medical students; (2) only senior medical staff (attending physicians or above) may care for confirmed and suspected cases of COVID-19; and (3) direct contact with patients must be minimised. TMUH also redirected patient flow according to daily reports from the Ministry of Health and Welfare (figure 1) to ensure all staff and patients' security. Most entrances were closed, leaving only a few closely monitored entry points. Before entering, everyone's body temperature was measured, and their travel, occupation, contact history and cluster records were checked. Visitors with fever were directed to a screening station, where they were examined by experienced medical staff. All confirmed cases were then transferred to negative pressure isolation rooms, while suspected cases were cared for in restricted wards by specialised teams. Medical students and new physicians were not allowed to visit patients in emergency rooms and could only care for patients who were confirmed negative.⁸

Studies concerned with physician obligations during epidemics have primarily investigated physicians' sense of medical professionalism while treating patients with communicable diseases such as HIV and tuberculosis, but since the risk of transmission in these cases can be effectively minimised, discussions of medical professionalism have centred around discrimination and patients' right

to privacy.^{4 9 10} Physicians are expected to treat patients without discrimination. Still, when administering care under the threat of a highly infectious disease such as COVID-19, physicians must be discerning about who and how they treat patients to minimise the risk of exposure for themselves and others.

A comprehensive understanding of medical professionalism involves how physicians practise under hazardous conditions, and how they perceive of their obligations under all circumstances, including while undertaking their expected roles. There are multiple conventional ways to measure medical professionalism, including through a physician's decision-making, interpersonal skills and search for excellence in their clinical training. These are in turn informed by a physician's values, attitudes and behaviour towards patients, colleagues, medical associations and society.¹¹⁻¹⁶ Harolds argues that the concept of medical professionalism can be understood through ethical principles, including patient autonomy, beneficence, non-maleficance and social justice.^{17 18} Ho *et al* point out that medical professionalism covers humanity, excellence, altruism, accountability and integrity, which are based on ethics, communication and clinical competence.¹⁵ Cruess suggests that professionalism also covers the concept of the 'social contract', arguing that physicians are granted the role of medical professional, but to be recognised as such, it is necessary to comply with an implicit agreement between the public and the profession.^{14 19} Freidson then supposes that searching for pre-eminence in medicine grants physicians prestige and expert authority, which makes them highly respected in public.²⁰ While other literature addresses observations and concerns about medical professionalism, Chiu's framework represents the cultural context in Taiwan and supplies a holistic perspective, including patient care, making appropriate clinical and ethical decisions, communication with patients and colleagues and maintaining high respect in society. These facets comprise the developed sense of medical professionalism a physician needs to regulate them on the path to good doctoring.²¹ Therefore, this study uses Chiu's framework as a basis for medical professionalism: medical knowledge and clinical

skills, communication with patients, teamwork, public health duty and protection of patients' rights.¹²

However, presented with the threat of a pandemic, physicians' given sense of professionalism is challenged, providing researchers an opportunity to investigate their understanding of the role. In light of this response, it is essential to determine how trainees perceive their role and responsibilities as physicians during a pandemic. Therefore, we aim to explore how medical students and new physicians learn, respond to social expectations and perceive their obligations.

METHODS

Participants

In Taiwan, undergraduate medical programmes recruit high school students. Before 2013, medical students were required to undergo 7 years of medical courses (including a 1-year internship), followed by one postgraduate year (PGY). The current model requires 6 years of coursework, followed by a 2-year PGY training, doing away with the 1-year internship.²² Fifth and sixth-year students must undergo clerkship training in teaching hospitals with supervised practice in clinical settings. Both old and new programmes provide liberal arts and medical humanities courses in addition to medical courses, including medical sociology (core course), medical paradigms and ethics (core), medical professionalism (elective) and so on.²³ More clinical and ethics courses are available to all medical students and staff in hospitals.

This study used purposive sampling. Only medical trainees were selected, including those under clerkship training (fifth and sixth-year medical students), new physicians during their PGY or those undergoing core specialty training for internal medicine, surgery, paediatrics or obstetrics/gynaecology. They were also all trained in TMUH but did not have to be graduates of Taipei Medical University. We conducted three focus groups for participants in the three training stages, recruiting four residents, six PGY students (PGYs) and seven clerks. Only trainees of the same type were placed in groups together. Focus groups were chosen to encourage rich discussion between participants and possible reflection on others' experiences while research topics were still emerging.²⁴ At the time of data collection, trainees were divided into two tracks: 1-year PGY (with a 1-year internship) and first-year PGY (without an internship). We selected students who met the inclusion criteria, intending to maintain heterogeneity among participants regarding specialty and gender. We stopped collecting data when saturation was reached and validated our results with the vice superintendent in charge of teaching. Here, saturation was reached when researchers heard the same comments multiple times during interviews.²⁵

Patient and public involvement

This study had no patient and public involvement in terms of study design.

Data collection

We collected data from 31 March to 2 April 2020. The focus group questions were as follows: (1) Have you cared for patients with COVID-19? Under what degree of intensity? (2) Did patient care protocol change since your hospital began admitting patients with COVID-19? In what way? How did you respond to these changes? (3) What are your obligations as a physician? Were there any changes in this perception after the outbreak of COVID-19? (4) If a significant epidemic of COVID-19 occurred here in Taiwan, would you choose to work in your usual setting? What would cause you to stay/quit?

Moderators and coders were trained before the study began to familiarise them with the content and construct of medical professionalism. Focus group moderator C-HC probed participants for details about what they perceived, valued and practised during their clinical experience, especially in the third and fourth questions. The focus groups were recorded and transcribed.

Data analysis

Three members (first three authors) of this qualitative study used verbatim coding to analyse the transcripts.²⁶ Data were analysed by both inductive and deductive coding. First, coders went through the transcripts and refined the keywords independently based on a code developed with Chiu's framework.¹² First-order codes were defined and selected based on commonalities between keywords recognised by the coders, as well as predetermined theories of medical professionalism.¹² The coders were not allowed to discuss among each other until all coding was completed. New themes were allowed to emerge from the transcripts, such as frustration and a sense of accomplishment. Second, the three coders compared individually defined first-order codes and kept the first-order codes that achieved 0.8 inter-rater reliability.²⁷ They then renamed the first-order codes and aggregated the relevant elements into theoretical categories. Data were processed from verbatim transcripts, and coding lists emerged iteratively to allow the coders to deliberate on the associations between data, codes and categories. Lastly, we used reciprocal checking to confirm that the themes were allocated correctly.

RESULTS

In total, 17 medical students and new physicians participated in this study, five (31.25%) of whom were female. Participants consisted of four residents, six PGYs and seven medical students. Demographic statistics are reported in [table 1](#).

We determined four major dimensions with corresponding subdimensions ([figure 2](#)), including medical knowledge and clinical skills, sense of public duty, teamwork and protection of patient rights. Definitions and select quotations from the transcripts are listed in [table 2](#).

Medical knowledge and clinical skills

This dimension, which applies to occupations that involve specialised knowledge of a subject, covers continuous

Table 1 Participant characteristics

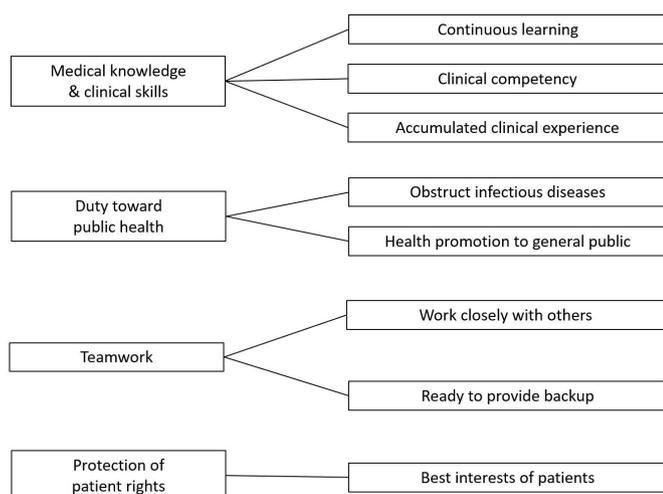
Demographic variables	Subgroup	n (%)
Gender	Female	5 (31.25)
	Male	12 (68.75)
Training stage		
Residents	Family medicine	1 (6.25)
	Urology	1 (6.25)
	Paediatrics	1 (6.25)
	Surgery	1 (6.25)
PGYs*	PGYs	5 (31.25)
	PGY1	1 (6.25)
Clerks	5th-year medical students	5 (31.25)
	6th-year medical students	2 (12.5)

*Postgraduate year students (PGYs) belong to the old model of medical education (7 years in medical school plus 1 year in PGY); the PGY1 group belongs to the current medical education system (6 years in medical school plus 2 years in PGY).

learning and clinical competency. Medical knowledge refers to how medical education continues during emergencies such as the COVID-19 pandemic, while clinical skills refer to how participants evaluate their clinical competencies and how these competencies reinforce their confidence when caring for patients with COVID-19.

Continuous learning

Medical education did not cease due to COVID-19. TMUH managed to minimise personal contact by providing online training courses and rearranged intensive learning programmes to allow medical students and new physicians to continue learning without interruption. Physicians were also motivated to learn the most updated medical knowledge and treatment guidelines on COVID-19 from established journals, with all study participants saying they were devoted to learning as much

**Figure 2** Major dimensions and subdimensions of medical professionalism and external factors.

as they could. Select quotations from the transcripts are listed in [table 2](#).

Clinical competency

Respondents reported that reduced personal contact with patients during the pandemic hindered their ability to care for patients with and without COVID-19 alike. This made them more concerned about dealing with challenges in future training stages.

Accumulated clinical experience

Medical students and new physicians said they feared they would lack competency and confidence if asked to care for patients with COVID-19. Some students even assumed they might cause more chaos if they were assigned to the COVID-19 ward. Fears related to unknown risks also drove participants to seek more information and carefully follow standard operating procedures. Residents, on the other hand, reported less fear, as they had more clinical experience in handling patients with or without COVID-19. This shows that clinical experience had a positive effect on trainees' confidence.

Sense of public duty

This dimension—defined as the obligation to be aware of disease prevention and to eradicate communicable diseases—consists of two subdimensions: obstructing communicable disease and promoting public health. The former covers the participants' knowledge and actions intended to block disease transmission, while the latter discusses their involvement in public health education efforts.

Obstructing communicable disease

In TMUH's redesigned care protocols, medical students and new physicians were responsible for second-line care for all patients. Participants were fully aware of their roles as caregivers and their duty to deter communicable diseases. The participants were also proactive in responding to the requirements of their hospital.

Health promotion

Beyond the hospital limits, participants were also willing to share what they know about the virus and related preventative measures with the general public.

Teamwork

This dimension—defined as working together with others, such as nurses, general staff and other physicians, to deliver patient care smoothly—includes two subdimensions: working closely with others and readiness to assist. Here we discussed the roles medical students and new physicians play under the division of labour and their readiness to replace front-line medical staff at any moment.

Working closely with others

Modified care protocols at TMUH, especially emphasised teamwork. Trusting team members and being team players were strongly encouraged.

Table 2 Dimensions, subdimensions and representative quotations

Dimension/ subdimension	Definition	Representative quotations from transcripts
1. Medical knowledge and clinical skills	Applies to occupations that involve specialised knowledge of a subject, field or science, and invariably involves prolonged academic training, formal qualifications and prestige.	
1.1. Continuous learning	Seeking further academic and clinical knowledge about COVID-19.	<p><i>We study [COVID-19], not because the hospital requires it, but because the mass media has reported it. We are also interested in understanding this disease. (R1)</i></p> <p><i>I read the journal NEJM regularly. In fact, this month is related to COVID-19. I read it to understand the most updated knowledge and treatment protocol. (R2)</i></p> <p><i>For all medical students, PGYs, residents, and attending physicians, the hospital provides a detailed introduction of COVID-19, including updated diagnostic standards, notification standards, symptom treatment, etc. (C6)</i></p> <p><i>No matter how bad our ability is now, at least we have the platform to make ourselves better. We know how to upgrade ourselves. (C5)</i></p>
1.2. Clinical competency	Clinical competency to care for patients with or without COVID-19.	<p><i>We are workers under a system, that is, we follow SOP. I don't think we need to think too much. (R3)</i></p> <p><i>The teacher demonstrates to us several times before letting us in. (P3)</i></p> <p><i>We are about to graduate and begin PGY training soon. I am more worried about our transition from students to frontline clinical staff, but it seems that we are not very sure how to deal with such patients. What should we do when we encounter [the virus]? How should we protect ourselves? (C5)</i></p>
1.3. Accumulated clinical experience	Clinical experience accumulated from care of patients with and without COVID-19.	<p><i>We are not on the front lines because we have insufficient abilities; we can't even give first aid to patients. (P3)</i></p> <p><i>It is a bit like a problem you have never encountered that you need to solve from experience, like it may be similar to SARS, etc. (C6)</i></p> <p><i>According to our current strengths and abilities, I believe I would cause more chaos and not help at all. Like our senior just said, we have not yet had enough training to handle the disease. (C4)</i></p> <p><i>... [You] need to refer to other people's experiences ... and the ability to search for information, not just about health, or jobs. In order to solve patients' health problems, you may need to have a lot of different abilities. (C6)</i></p>
2. Sense of public duty	Obligation to be aware of disease prevention, as well as report and eradicate communicable diseases.	
2.1. Obstruct communicable disease	Taking an active role and assuming responsibility in preventing communicable disease.	<p><i>The changes I made were to wash my hands more often and wear more protective gear. (R1)</i></p> <p><i>Even if there were no COVID-19, we are actually still exposed to many diseases that are even more lethal. For example, we also face patients with HIV, but we still need to operate on them. The only thing that matters is that the corresponding protective measures must be made. (R2)</i></p> <p><i>I am more cautious when I take a patient's history; if I miss anything, it will become a significant stressor. (R3)</i></p> <p><i>In the past few years, I have felt that there seem to be some protocols that should be executed exceptionally well. For example, don't mess up. (P2)</i></p> <p><i>All the frontline medical staff has a sufficient sense of responsibility. Of course, the aim is to stop COVID-19 in the first line of care. (C2)</i></p> <p><i>Then we have to interview patients. In the past, I only asked a few questions about their travel history, like 'Have you been abroad in the past three months,' but now I ask further questions, like 'What's your occupation' or 'Have you been to populated areas.' (C6)</i></p>
2.2. Public health promotion	Providing health education to patients and the general public.	<p><i>Health education is not just for patients, but also for the public. For example, we can clarify wrong disinfection methods or other false ideas. (R2)</i></p> <p><i>Doctors have to promote correct health information to the general public. (R4)</i></p>
3. Teamwork	Working together with others, such as nurses, staff and other physicians, in order to smoothly deliver patient care.	

Continued

Table 2 Continued

Dimension/ subdimension	Definition	Representative quotations from transcripts
3.1. Work closely with others	Working together with others to achieve efficiency and effectiveness of patient care.	<p><i>Nursing staff enter negative pressure wards more frequently than we do. They visit patients four times a day to take temperatures and finish most jobs during their four visits.</i> (P4)</p> <p><i>In the emergency department, medical staff have to decide new patients' categories and report them to the hospital. Since it's impossible to confirm a diagnosis in the ER, medical staff report all suspected cases, the fifth category of severe infectious pneumonia. Once we get notes from the ER, patients are placed in negative pressure wards, then taken for a second examination. Therefore, we are all well-informed and prepared when we care for new patients.</i> (P5)</p> <p><i>So far, all physicians in the department of infectious diseases have been divided into several groups; that is, only two or three medical personnel, including PGYs, enter an isolation ward at one time... Of course, if you need to see a patient, PGYs also need to see.</i> (P5)</p>
3.2. Readiness to provide assistance	Readiness to provide front-line care to patients with or without COVID-19.	<p><i>If there is really a significant outbreak, whoever needs us—even I, as a urologist—will go.</i> (R2)</p> <p><i>Even if there were no COVID-19, we are actually still exposed to many diseases that are more lethal. For example, we also face patients with HIV, and still need to operate on them. The only thing that matters is that the corresponding protective measures must be made.</i> (R2)</p> <p><i>We haven't reached that moment yet. We might not be able to imagine how to react to a possible outbreak. But with what's happening in New York and Europe, of course it's possible that we can get rid of our obligations. No matter our specialty, in the end, we will all need to face this disaster.</i> (P2)</p> <p><i>We still have to prepare ourselves to care for such patients, but at this stage, when I'm about to graduate from medical school, I am worried about how to deal with them, in this hospital or elsewhere. I am more concerned about this.</i> (C5)</p> <p><i>Since you chose to be a doctor, you will be more likely to get those diseases than ordinary people... Therefore, if an outbreak happens, if there are enough supplies, I won't refuse to take care of patients.</i> (C3)</p>
4. Protection of patient rights	The commitment by physicians to ensuring the fundamental rights of patients.	
4.1. Best interest of patients	Helping patients make decisions based on their best interests.	<p><i>Because we care for children, we think that parents are more concerned about their children than anyone else. Sometimes they don't care about themselves, but more about their children.</i> (R3)</p> <p><i>I think that a doctor should treat not only a patient's disease, but also become his/her companion.</i> (R3)</p> <p><i>I believe that medical staff, compared to ordinary people, deal with human lives more, so I think the difference lies in responsibility.</i> (C2)</p>
ER, emergency room; PGYs, postgraduate year students; SARS, severe acute respiratory syndrome; SOP, standard operating procedure.		

Readiness to provide assistance

Residents tend to be confident in their medical knowledge and clinical skills and display a willingness to assist if front-line staff become infected. Medical students, on the other hand, tend to be more worried about their competency and show divergent attitudes towards caring for patients with COVID-19. The only shared assumption is that they will be provided with sufficient protective equipment.

Protection of patient rights

This theme refers to the commitment to ensuring the fundamental rights of patients. The dimension includes participants' understanding of their lofty duty to 'work in the patient's best interest'. One resident, now training in paediatrics, said that it is her duty to provide clinical

care and to accompany her patients. One medical student feared that his limited clinical experience might cause more chaos within the hospital.

External factors

We regard hospital policies and social expectations to be the primary external factors that either bolster or hinder physicians' sense of professionalism. Participants said that they must be guaranteed full protection through hospital policy and cooperation of all staff, or else they might refuse to provide care. Social expectations determined how the participants responded to public pressure and contributed to their sense of importance as physicians. The most vital sense of anticipation came from supervisors and the media, rather than patients with COVID-19. Related quotations from the transcripts are listed in

Table 3 Dimensions, subdimensions and quotations on external factors that affect medical professionalism

Dimension/subdimension	Definition	Representative quotations from transcripts
Hospital policy (such as isolation and triage measures)	The policies enacted by hospitals to supply full protective gear and redesign care protocol in order to minimise risk of exposure.	<i>I think they set rules strictly in the emergency department and manage all suspected cases as confirmed. There are only two categories: one is suspected, and the other is the fifth category. (R3)</i> <i>The hospital limits visiting time for admitted patients, and patients' families are only allowed to accompany patients at night. Medical students are not allowed to go to specific wards. Video conferences are held to minimize contact. (R4)</i> <i>I check [patients] every day, but now it seems like the frequency of care could be lower ... because I need to wear total 'rabbit gear.' (P2)</i> <i>Policies are changing all the time following the changes in the epidemic report. (P5)</i> <i>Regarding isolation and triage measures, some medical staff are fixed in a particular area, so that if there is an outbreak in the hospital, it can be confined in that area. (P5)</i> <i>If there is an outbreak, protecting myself is my priority. If I'm not able to protect myself, how can I help my patients?... As I mentioned earlier, if the hospital requires me to do something, I will do my best according to my ability. If I have extra time and energy, then I will think about what else I can do. (C4)</i>
Social expectation	The public's expectations of the role physicians should play during an outbreak	<i>As for COVID-19, I think my job as a physician is secure. Society still needs me. I think this is very good. (P2)</i> <i>Being a doctor is to comply with the system's expectations and to exceed the bare minimum. You are always pursuing what society expects from a doctor. (C3)</i> <i>With my current limited ability, I can only do what I can do now under the norms of the system, and then I can slowly meet others' expectations. (C3)</i>

table 3, while the relationship between medical professionalism and external factors is listed in figure 3. Here we do not examine the interactions between these two factors.

DISCUSSION

When working under a pandemic, medical personnel must care for patients while facing an unknown risk. This study suggests that trainees prepared themselves to care

for patients with COVID-19, but were only willing to take the risk under a well-designed protocol that maximises the safety of all hospital personnel. Aside from seismic changes in safety protocol, we were also concerned about the possible dilemma between fear of infection and medical professionalism. At the time of the study, there were eight patients with COVID-19 at TMUH. Since the hospital ensures minimal direct contact between new physicians and patients with COVID-19, the students were in a limited learning environment. Staff safety was the top priority at TMUH, so to ensure learning quality, the hospital also provided teaching courses and regular meetings online, as well as intensive in-person courses. The efficacy of online learning requires discussion, and further evaluation of the competency of trainees who undergo online education, especially medical students, will be necessary.

We approached the major dimensions of medical professionalism in this study from the individual, hospital and societal levels. At the individual level, participants were concerned about their medical knowledge and clinical skills, public duty, teamwork and patient rights. The participants were fully protected by hospital policy and indicated an awareness of the social expectations as physicians. According to Swick, medical professionalism is defined as 'how [physicians] meet their responsibilities to individual patients and communities'.^{28 29} More specifically, this concept covers attitudes (such as empathy),¹³ behaviours (such as communication skills),³⁰ knowledge and skills³¹ and professional values (such as altruism), which guide physicians in their practice.^{32 33} Our findings also reveal the significant impact society and hospitals have on how trainees perceive their roles as physicians

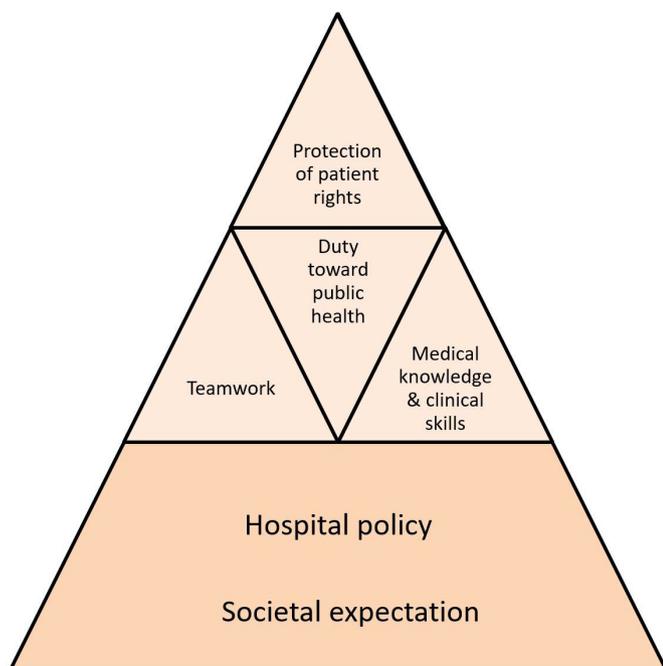


Figure 3 Medical professionalism and external factors.



and willingness to take responsibility. Among the new generation of physicians who might prioritise their quality of life,³⁴ we found positive reciprocal reinforcement between individuals, hospitals and society, which further helps new physicians build their professional careers.²⁰

As opposed to their daily routines, we were also curious about how the participants reacted under the extraordinary circumstances of a pandemic. We suspected that medical students and young physicians would be reluctant to care for patients whether or not they had been diagnosed with COVID-19, but participants reported a willingness to help, even if they were concerned about their competency. They were able to achieve this goal thanks to the following attributes.

Medical knowledge and clinical skills, including continuous learning and professional competency, are the foundation of good doctoring.^{12 15 19} If students felt that they lacked sufficient clinical training, they expressed worry about their inexperience and perceived deficiency when caring for patients with COVID-19. New physicians with a few years of clinical practice behind them knew how to update their knowledge and therefore had more confidence in handling the disease. The more accumulated clinical experience a participant had, the more confident and less afraid they were, with clear progress apparent with each progression in training stage. The best way to prepare is by practising in a clinical setting.³⁵ Experience in caring for patients without COVID-19 could reinforce trainees' confidence and willingness to devote themselves to caring for patients with COVID-19.

Physicians are also obligated to assist public health efforts.^{12 21} In this study, participants showed devotion to stemming the spread of communicable diseases and providing health information to the general public. Participants were all aware of their role in public health and were willing to share their knowledge with the public. This differed from our previous study, in which medical students were more concerned with medical knowledge and clinical skills than public health.¹²

Being a team player is highly important to facilitating a team, especially as TMUH dispatched front-line responders with specialties in infectious disease and thoracic medicine to care for confirmed patients with COVID-19. All other attending physicians were required to take shifts at the fever screening station. Other medical staff, such as residents and PGYs, cared for patients with other diseases, and were required to prepare to take over for the front-line team if needed. The superintendent and vice superintendents required all physicians to perform their duties, and spoke personally with any staff members who refused to perform their assigned tasks. In general, well-functioning hospitals are run by leaders who set good examples of medical professionalism. While other studies propose assessments and teaching skills to foster team building,^{36–38} this study suggests that participants can build these skills while performing their roles in a clinical setting during a pandemic. Although organisational culture also plays a role, this result shows that

teams and role models are crucial to fostering a sense of teamwork.

As for protecting patients' rights, while it is important to practise altruism and act in patients' best interests, it is rather difficult to ignore the potential threat to one's own life and the health of others, especially since the new physicians needed to administer care to all patients in the hospital. Therefore, without full protection, the participants were reluctant to come in contact with the virus.

Taiwan managed to avoid a widespread outbreak thanks to a well-functioning government and public health system, yet despite its success, are there still lessons to be learnt from this pandemic? We believe that close cooperation between hospitals, medical staff and patients was essential to stopping the pandemic, and to this end, medical personnel performed their duties well. Medical students and new physicians who were less experienced also displayed immense professionalism and willingness to meet their obligations under extreme circumstances.^{39 40}

Limitations

There are two major limitations in this study. First, purposive sampling might have created a bias towards more active and conscientious participants. Second, since there was no major outbreak in Taiwan during the study period, all results are based on participants' attitudes and best judgement rather than behaviour.

CONCLUSIONS

In this study, the factors with the most significant effect on new physicians' sense of professionalism were external: hospital policy and public expectation. Participants mainly spoke of medical professionalism in terms of acquiring medical knowledge and clinical skills, an obligation to uphold public health, the importance of teamwork and the duty to protect patient's rights. Overall, the new physicians stepped into their roles as medical professionals under threat and equipped themselves with the essential knowledge and skills to take care of those patients with COVID-19 if they were obliged to do so.

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