

BMJ Open Primary health care physicians' perspective on COVID-19 pandemic management in Qatar: a web-based survey

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ABSTRACT

Objectives To assess primary care physicians' satisfaction towards COVID-19 pandemic management in Qatar and to identify the associated factors with their satisfaction.

Design A cross-sectional web-based survey conducted from 1 June to 30 July 2020.

Setting All the 27 public primary healthcare centres in Qatar.

Participants 294 primary care physicians working in the publicly run primary healthcare corporation in Qatar.

Primary outcome measures Overall satisfaction towards COVID-19 management in Qatar and satisfaction towards each aspect of this management including COVID-19 clinical practice guidelines, psychological support, team dynamics, work safety as well as institutional and governmental regulations.

Results 294 primary care physicians participated in the survey with a response rate of 65%. Overall satisfaction of physicians towards COVID-19 management at Primary Health Care Corporation was 77%. The highest satisfaction was towards institutional and governmental support while it was the lowest towards the corporation case definition and management of COVID-19 guidelines. Female physicians were less satisfied with psychological support in comparison to males (64.1% and 51% respectively, $p=0.049$). Overall satisfaction towards case definition and management of COVID-19 guidelines were strongly correlated with their clarity, updating these guidelines in due time and applicability of the guidelines ($r=0.759$ $P<0.001$; $r=0.701$ $P<0.001$; $r=0.698$ $P<0.001$) respectively, while satisfaction towards work safety was strongly correlated with availability and quality of Personal Protective Equipment provided ($r=0.83$ $P<0.001$ and $r=0.811$ $P<0.001$ respectively).

Conclusion Most primary care physicians in Qatar who responded to the survey were satisfied with the COVID-19 guidelines developed rapidly in response to this pandemic. Availability and quality of PPE were a particular concern. The clinicians who were less satisfied were younger and female.

INTRODUCTION

The COVID-19 is sweeping across the globe, affecting more than 167 million people in 222

Strengths and limitations of this study

- This is the first population-based study among primary care physicians in Qatar to assess their satisfaction with local COVID-19 management.
- It provides a comprehensive measurement of physicians' satisfaction on different aspects of COVID-19 management including clinical guidelines, psychological support, work safety as well as institutional and governmental support.
- This study included only primary care physicians working in the public sector in Qatar.
- The level of satisfaction measured reflects a certain stage of the pandemic which could change subsequently.
- The response rate (65%) was lower than desired.

countries with more than 3.4 million fatalities at the time of writing.¹ This pandemic is putting physicians under unprecedented conditions, where lack of solid knowledge and inadequate health system preparedness are disturbing clinician's sense of order and control.²

Being 'the first in, last out' health system, tremendous pressure is exerted on primary healthcare to cope and deal with the rising number of COVID-19 cases, alongside its usual role in providing primary care for patients with chronic illnesses, acute conditions, or even preventive care. In addition to its anticipated role in managing the aftermath of the contingencies.³ Taking into consideration the non-specific manifestations of this infection, even more pressure is placed on primary care physicians in making decisions on which suspected/confirmed COVID-19 patients to send home, refer to a specialist or send to hospital.⁴ Rawaf and colleagues summarised the early experiences of international primary healthcare systems during this



pandemic. They found that although primary healthcare utilisation has declined in the early critical stage, primary care continued to function as the primary point of contact for patients with COVID-19 and non-COVID-19 related conditions. In many countries, primary care expanded its role in supporting other sectors by growing its scope of practice and loaning staff to work in hospitals and other departments.⁵

As a foundation for the pandemic response, primary healthcare will need to continuously reinvent and transform itself.⁶⁻⁸ The resilience of health systems in response to COVID-19 is under question, including in high-income countries.⁹ Health system resilience can be defined as the capacity of health actors, institutions and populations to prepare for and effectively respond to crises; to maintain core functions when a crisis hits; and, informed by lessons learnt during the crisis, to reorganise if conditions require it.¹⁰

The satisfaction of the healthcare workforce is the cornerstone of every well-functioning health system.¹¹ As a result of the pandemic, healthcare providers are under an enormous amount of workload pressure along with increased total health expenditures. The overwhelming burden of COVID-19 illness could lead to caregiver burnout. The major causes of stress among healthcare workers include too frequent changes in policies, working beyond the job description, new daily tasks, long working hours, sleep disturbances, debilitating fatigue, and the risk of getting the infection and putting their family at risk of a life-threatening condition.¹²⁻¹³ According to China's National Health Commission, as of 24 February 2020, more than 3300 healthcare workers had been infected and as of 3 April, a total of 23 of them have died.¹⁴ Unfortunately, on 2 September 2020, the WHO Pan American Regional Office announced that 570 000 healthcare workers were infected and 2500 died due to COVID-19.¹⁵ Physicians' burnout and shortage of healthcare workforce compromise patient care and threaten the stability of health systems.¹⁶⁻¹⁸

Physician professional satisfaction is not only important for the quality of care provided, patient satisfaction and adherence to treatment,¹⁹ but it is also essential during this critical time as a motivational resource to reduce physicians burnout and to retain the medical workforce.¹³

Health policy-makers need to recognise the value of response to this crisis from a primary health perspective. Despite the rapidly evolving body of literature on COVID-19 disease, the level of primary healthcare physician's satisfaction with the management of the COVID-19 pandemic is lacking. This study aimed to assess primary healthcare physicians' satisfaction towards COVID-19 pandemic management in Qatar and to identify the associated factors with their satisfaction. The results of the study can help healthcare organisations to be more specific in developing evidence-based changes in the primary care management of the COVID-19 pandemic.

Primary healthcare and COVID-19 situation in Qatar at the time of the study

Qatar is one of the Arabic Gulf countries with a total population of almost 2.8 million in 2020.²⁰ The publicly run Primary Health Care Corporation (PHCC) constitutes the major provider of primary healthcare to both citizens and expatriates through 27 health centres spread all over the country. In 2019, more than 1.4 million individuals were registered in PHCC health centres, who had around 3.5 million visits during that year.²¹

The first reported case of COVID-19 in Qatar was on 27 February 2020, for a Qatari male who returned from Iran. In March 2020, Qatar witnessed an increasing number of confirmed COVID-19 cases which was followed by national restrictions in the same month. As of 17 June 2020, a total of 83 092 cases and 82 deaths have been reported in Qatar.²²

Starting in March 2020, PHCC worked in alignment with the Ministry of Public Health of Qatar and secondary care on an emergency action plan in response to the pandemic. It introduced major changes to its service including dedicating four out of the 27 health centres as testing and holding facilities for COVID-19, while other health centres have rearranged their triaging area to separate suspected cases of COVID-19 from other patients, and provided at least one room for COVID-19 testing. As of mid-June 2020, PHCC helped in testing 54 824 individuals and detecting 11 448 confirmed cases.²³ Figure 1 illustrates the number of biweekly PHCC swabbed and positive cases between 14 March 2020 and 15 June 2020.

To reduce the risk of infection for both patients and healthcare workers, PHCC introduced telemedicine consultations, home delivery of medications, and cancelled some of its preventive programmes such as cancer screening, while maintaining vaccination clinics for children less than 5 years of age, walk-in clinic and urgent care services.²⁴

METHODS

Study design and setting

This is a cross-sectional web-based survey conducted from 1 June to 30 July 2020, that aimed to assess the level of satisfaction among primary healthcare physicians towards COVID-19 management in Qatar and to identify factors associated with their satisfaction.

All primary healthcare physicians (PCPs) were invited through their PHCC email to participate in the study with a link containing anonymous, self-administered questionnaires using *SurveyMonkey* software. The email also provided information about the aim of the study, a confidentiality agreement, and consent for voluntary participation.

PHCC operations office was contacted for an updated list of working PCPs, which provided a total of 450 PCPs who were mainly family physicians (certified in family medicine), general practitioners (medical doctors who do not have specialty certification or postgraduate training),

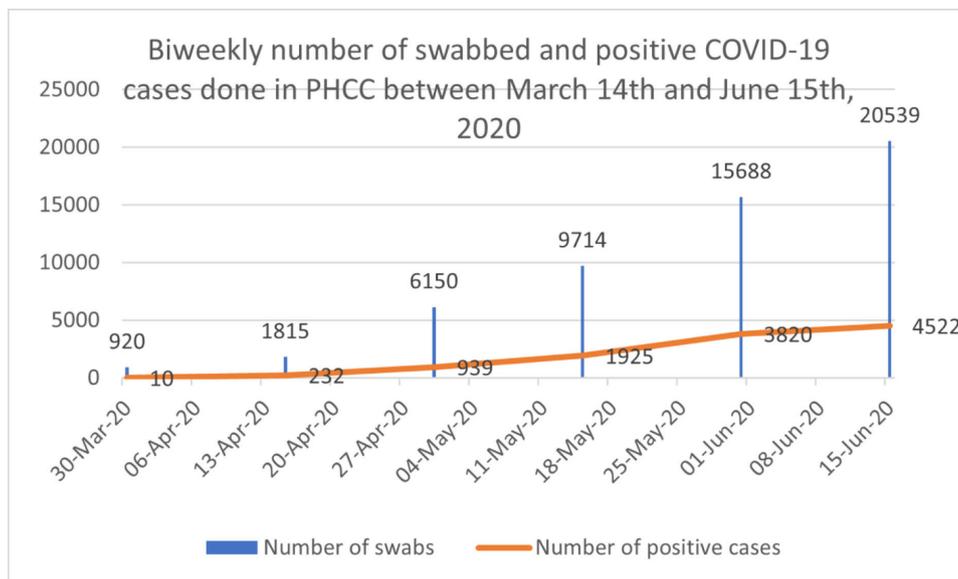


Figure 1 Number of biweekly Primary Health Care Corporation (PHCC) swabbed and positive cases between the 14 March 2020, and 15 June 2020 (Source: Strategy Planning and Health Intelligence, PHCC, Qatar, 2020).

in addition to few PCPs specialised in internal medicine, paediatrics, ophthalmology and ENT. PCPs who were only providing administrative work or were on leave during the data collection period were excluded from the study.

Method of data collection tool

The questionnaire was developed based on expert opinion and review of the relevant literature. We used similar measures examined in previous studies on physicians professional satisfaction; however, it focused on the external factors of job satisfaction that were related to the working environment and the healthcare system regulations during the current COVID-19 pandemic, and was modified according to the local management guidelines at the level of primary healthcare in Qatar.^{19 25 26} This questionnaire was pretested with a convenient sample of the study population, and some questions were modified based on the feedback.

The survey included items on physicians' demographics and work-related characteristics, in addition to a comprehensive assessment of physicians' satisfaction towards three major categories of PHCC management of COVID-19 including COVID-19-related clinical practice guidelines (CPG), work safety and psychological environment in the health centre, as well as institutional and governmental regulations on COVID-19. CPG for COVID-19 management were further categorised into four items: COVID-19 case definition and management, postexposure pathway for PHCC staff, PPE use regulations and COVID-19 patient pathway guidelines.

Physician satisfaction was measured using a Likert scale-based questionnaire that provided 5-options for respondents (1=Not at all satisfied; 2=Not satisfied; 3=somewhat satisfied; 4=Very satisfied; 5=extremely satisfied).²⁷ Likert scale was considered in this study to avoid nonresponse to the questions. Physicians who answered 'Very satisfied' or

'extremely satisfied' were considered to be satisfied with that particular aspect of COVID-19 management.

Data management

The data were analysed using SPSS, Windows, V.20. For categorical variables, the frequencies and percentages were calculated. A χ^2 test of significance was performed to test relationships between proportions. A value of $p < 0.05$ was considered the cut-off value for significance. The linear correlation coefficient was used to measure the strength of the relationship between variables.

RESULTS

Out of the 450 PCPs working in PHCC, 294 physicians responded to the study questionnaire with a response rate of 65%. 55.4% were males, and 49.7% were 41–50 years old. More than two-thirds of the respondents were family medicine physicians and had more than 10 years of experience in clinical practice (table 1).

Table 2 shows that around 74%, 64% and 57% of participants were satisfied with the institutional/governmental support, internal environment (psychological support and work safety), and all CPG respectively.

There were statistically significant relationships between satisfaction and different physician specialties where the rate of being satisfied towards the selected domains was the lowest among family medicine physicians compared with other specialties; the level of overall satisfaction was around 70% for family medicine physicians, 95% for general practitioners and 88% for other specialties with a $p < 0.001$. Older physicians had statistically significantly higher satisfaction rates towards overall COVID-19 management, clinical guidelines, psychological support, and team dynamics. Male physicians were more satisfied with the psychological support and team dynamics than

**Table 1** Demographic and job characteristics of respondent primary care physicians (PCPs) working during COVID-19 pandemic in Qatar

Variable	Categories	Number of respondent PCPs	Frequency %
Age group (years)			
	≤40	79	26.9
	(41–50)	146	49.7
	>50	69	23.5
Gender			
	Female	131	44.6
	Male	163	55.4
Specialty			
	Family medicine physician	197	67.0
	General practitioner	50	17.0
	Others	47	16.0
Duration of clinical practice (years)			
	≤5	24	8.2
	(5.1–10)	45	15.3
	>10	225	76.5

Others: internal medicine, ophthalmology, Ear, Nose and Throat (ENT), pediatrics.

their female colleagues with statistical significance (64.1% and 51% respectively, $p=0.049$). Otherwise, gender did not have a statistically significant relationship with other or overall domains (table 3).

The COVID-19 pandemic situation necessitated the rapid development of four CPG for primary care in Qatar. We assessed the linear correlation coefficient (r) between overall PCPs' satisfaction towards each of these guidelines and their satisfaction with the individual

guideline components. Guidelines clarity and updating these guidelines in due time were strongly associated with overall PCPs satisfaction towards the first CPG 'COVID-19 case definition and management' with an $r=0.759$, $p<0.001$, and $r=0.701$, $p<0.001$ respectively. For the second CPG 'Post-exposure pathway for staff', the risk assessment method for staff exposure to COVID-19 and management of unprotected staff exposure to COVID-19 showed the strongest statistically significant correlation with this guideline ($r=0.736$, $p<0.001$ and $r=0.711$, $p<0.001$, respectively). PCPs' satisfaction towards the third CPG, which was on PPE use regulations, was strongly correlated with their satisfaction with the recommended type of PPE to be used by staff, the applicability of these guidelines in the health centre, and the scientific background of these guidelines ($r=0.76$, $p<0.001$; $r=0.764$, $p<0.001$ and $r=0.746$, $p<0.001$, respectively). The fourth CPG was on the COVID-19 patient pathway, for which overall PCPs' satisfaction was strongly correlated with their satisfaction with modifying the guidelines according to their feedback, the clarity of the guidelines, and the role of the on-call personnel support in PHCC ($r=0.754$, $p<0.001$, $r=0.744$, $p<0.001$ and $r=0.701$, $p<0.001$, respectively; table 4).

Similarly, there were positive correlations between overall satisfaction scores of PCPs towards psychological support, work safety and institutional/governmental regulations and their components as evident in table 5. Overall satisfaction towards psychological support was strongly correlated with all of its components with statistical significance ($r=0.741$ to $r=0.773$, $p<0.001$). Availability and quality of PPE were the strongest correlates with satisfaction towards work safety ($r=0.83$, $p<0.001$ and $r=0.811$, $p<0.001$, respectively). Reducing working hours and working from home were the strongest correlates with overall satisfaction with institutional and governmental regulations ($r=0.691$, $p<0.001$).

Table 2 Primary care physicians' (PCP) overall satisfaction towards clinical practice guidelines, the internal environment of the health centre, and institutional/governmental support

Variable	Categories	Number of respondent PCPs	Number of satisfied PCPs	Frequency of satisfied PCPs%
All clinical guidelines				
	▶ COVID-19 case definition and management	294	145	49.3
	▶ Postexposure pathway for staff	280	118	42.1
	▶ PPE use regulations	267	125	46.8
	▶ COVID-19 patient pathway	255	112	43.9
Internal environment				
	▶ Psychological support and team dynamics in the health centre	246	144	58.5
	▶ Safety of work in your health centre	246	131	53.3
PHCC institutional and governmental support				
		244	180	73.8
Overall				
		244	188	77.0

PHCC, Primary Health Care Corporation.

Table 3 Primary care physicians' (PCP) satisfaction rate broken down by individual physicians' characteristics

	Internal environment															
	All clinical guidelines				Psychological support and team dynamics				Safety of work				Institutional and governmental support			
	Number of satisfied PCPs/Total number of PCPs	% of satisfied PCPs	P value	Number of satisfied PCPs/Total number of PCPs	% of satisfied PCPs	P value	Number of satisfied PCPs/Total number of PCPs	% of satisfied PCPs	P value	Number of satisfied PCPs/Total number of PCPs	% of satisfied PCPs	P value	Number of satisfied PCPs/Total number of PCPs	% of satisfied PCPs	P value	
Age	≤40	31/65	47.7	0.005	32/61	52.5	0.007	27/61	44.3	0.14	41/61	67.2	0.06	41/61	67.2	0.008
	41–50	70/130	53.8		69/129	53.5		69/129	53.5		91/127	71.7		96/127	75.6	
	>50	45/60	75		43/56	76.8		35/56	62.5		48/56	85.7		51/56	91.1	
Gender	Female	62/109	56.9	1	53/104	51	0.049	53/104	51	0.61	71/102	69.6	0.24	80/102	78.4	0.76
	Male	84/146	57.5		91/142	64.1		78/142	54.9		109/142	76.8		108/142	76.1	
Specialty	Family medicine	81/170	47.6	<0.001	84/165	50.9	0.002	76/165	46.1	0.005	113/164	68.9	0.046	115/164	70.1	<0.001
	General practitioners	33/42	78.6		28/40	70		26/40	65		33/39	84.6		37/39	94.9	
	Others	32/43	74.4		32/41	78		29/41	70.7		34/41	82.9		36/41	87.8	
Duration of clinical practice	<5 years	12/20	60	0.93	12/19	63.2	0.69	10/19	52.6	0.99	13/18	72.2	0.85	14/18	77.8	0.16
	5.1–10 years	22/40	55		20/38	52.6		20/38	52.6		26/37	70.3		24/37	64.9	
	>10 years	112/195	57.4		112/189	59.3		101/189	53.4		141/189	74.6		150/189	79.4	

**Table 4** Linear correlation coefficient between overall primary care physicians' satisfaction towards each guideline and its components

	Overall satisfaction towards COVID-19 case definition and management
Clarity of these guidelines	r=0.759, p<0.001
Scientific background of these guidelines	r=0.688, p<0.001
Contribution of PHCC physicians to the development of these guidelines	r=0.679, p<0.001
Modifying these guidelines according to PHCC physicians' feedback	r=0.657, p<0.001
updating these guidelines in due time	r=0.701, p<0.001
method of communication of these guidelines with physicians	r=0.667, p<0.001
Applicability of these guidelines in the health centre	r=0.698, p<0.001
	Overall satisfaction towards postexposure pathway for staff
Clarity of these guidelines	r=0.676, p<0.001
Scientific background of these guidelines	r=0.62, p<0.001
Contribution of PHCC physicians to the development of these guidelines	r=0.688, p<0.001
Modifying these guidelines according to PHCC physicians' feedback	r=0.649, p<0.001
Risk assessment method including the definition of protected and unprotected staff exposure	r=0.736, p<0.001
Managing staff with unprotected exposure	r=0.711, p<0.001
	Overall satisfaction towards PPE use regulations
Clarity of these guidelines	r=0.688, p<0.001
Scientific background of these guidelines	r=0.746, p<0.001
Contribution of PHCC physicians to the development of these guidelines	r=0.704, p<0.001
Modifying these guidelines according to PHCC physicians' feedback	r=0.695, p<0.001
Applicability of these guidelines in the health centre	r=0.764, p<0.001
The recommended type of PPE to be used by staff in the context of COVID-19	r=0.76, p<0.001
	Overall satisfaction towards COVID-19 patient pathway
Clarity of these guidelines	r=0.744, p<0.001
Contribution of PHCC physicians to the development of these guidelines	r=0.69, p<0.001
Modifying these guidelines according to PHCC physicians' feedback	r=0.754, p<0.001
MOPH 16000 and 16 099 hotline role in PHCC Physician support	r=0.663, p<0.001
Emergency Medical Services (EMS) service response	r=0.602, p<0.001
On-call personnel support in PHCC	r=0.701, p<0.001

PHCC, Primary Health Care Corporation.

DISCUSSION

Being the 'front door' of health systems to the public, a robust primary healthcare system should be the foundation for any successful health emergency plan, as in the current situation of COVID-19 disease. Involving primary care physicians in the planning and action for this emerging pandemic is essential, especially that the majority of patients with COVID-19 are either asymptomatic or have a mild or moderate disease and are more likely to present to primary care.^{4 28}

According to Linzer, 'physicians work as a buffer between adverse work conditions and patient care at their own expense which might cause burnout and leaving the profession'. Also, research on patient experience found that satisfied and engaged staff, including physicians, provide better service and care for patients.²⁹

This national cross-sectional study examined physicians' satisfaction towards three domains of local COVID-19 management in Qatar from a primary healthcare perspective.

Physicians satisfaction towards COVID-19 CPG

The definition of CPG was updated in 2011 by the Institute of Medicine as: 'statement that include recommendations intended to optimize patient care that is informed by a systematic review of evidence and an assessment of the benefits and harms of alternative care options'.³⁰ With the COVID-19 disease pandemic, enormous pressure was exerted on both international and national guideline development groups to formulate recommendations to healthcare decision-making about this novel disease. Kredo *et al* have discussed several aspects of

Table 5 Linear correlation coefficient between overall primary care physicians' satisfaction towards psychological support, work safety and institutional/governmental regulations and their components

	Overall satisfaction towards psychological support and team dynamics provided in your health centre
Communication between higher management and physicians	r=0.745, p<0.001
Communication between health centre management and physicians	r=0.773, p<0.001
The ability of your supervisor to address your questions and concerns	r=0.755, p<0.001
Availability of resources to support your decision making about patient care	r=0.772, p<0.001
PHCC staff support hotline	r=0.741, p<0.001
	Overall satisfaction towards the safety of work in your health centre
PHCC staff health and safety policy	r=0.722, p<0.001
Accessibility to report and investigate arising problems	r=0.674, p<0.001
Availability of PPE equipment at your health centre	r=0.83, p<0.001
Quality of PPE equipment available in your health centre	r=0.811, p<0.001
Your training you on PPE use	r=0.68, p<0.001
	Overall satisfaction towards PHCC institutional and governmental support
Dedicating some health centre for patients with COVID-19 care	r=0.528, p<0.001
Cancelling routine appointments and preventive services at PHCC	r=0.528, p<0.001
Implementing telephone consultation for the public	r=0.513, p<0.001
Home delivery of medications for patients with chronic medical conditions	r=0.483, p<0.001
Temporary holding of on-site education for schools and universities	r=0.574, p<0.001
Reducing working hours and allowing work from home for governmental and private institutions	r=0.691, p<0.001

PHCC, Primary Health Care Corporation.

CPGs development process including the strength of the evidence underpinning recommendations, updating the guidelines promptly, presentation and communication, implantability and acceptability of the CPG, contextualising international CPGs into local health systems, and finally the role of shared decision making in developing these guidelines.³¹

In the current study, more than half of the participating physicians were satisfied with all these CPGs where aspects such as clarity, applicability, scientific background and primary care physicians' contribution to the development and modification of the COVID-19 CPGs were highly correlated with their satisfaction. These findings were consistent with a previous qualitative study by Lugtenberg *et al* on Dutch general practitioners' adherence to CPGs who found that lack of applicability or lack of evidence and unclear guideline recommendations were rated as barriers in 68% and 43% of the key recommendations respectively.³²

Physicians satisfaction towards psychological support, team dynamics and work safety

The current survey found that about two-thirds of participating physicians were satisfied with the local environment in the health centre including psychological support, team dynamics and work safety.

Dewey *et al* clarified the role of organisational leaders in supporting physicians during the COVID-19 pandemic;

they called for clear compassionate communication from leaders towards clinicians, in addition to managing their expectations, clarifying working hours, providing sufficient resources, and effective personal protective equipment. Furthermore, supportive work culture and reduction of non-critical work may all help to promote physicians' mental well-being.³³

In Qatar, primary care physicians' satisfaction with the provided psychological support and team dynamics was strongly correlated with their communication with different levels of management, availability of resources to support decision making, and PHCC hotline. In comparison, factors associated with psychological benefits for frontline medical staff in China were strict infection control measures, the availability of specialised equipment, recognition of their efforts by hospital management and the government, and reduction in reported cases of COVID-19.³⁴

The need for effective team dynamics during this pandemic was also highlighted in another survey in Pakistan on 222 physicians directly involved in caring for patients with COVID-19. More than 80% of respondent physicians reported that they expected full support and cooperation from their administration in addition to providing protective equipment. They believed that senior physicians should be role models and provide clear messages and maintain a positive environment. And for

their peers, to be responsible, supportive, protective of each other, and work as effective teams.³⁵

In our study, physicians' satisfaction with work safety was strongly correlated with the availability and the quality of PPE provided. Similarly, a survey on 304 healthcare workers in Iran found that the benefits of PPE access extended beyond physical protection into statistically significant association with better job satisfaction and less distress.¹³

Physicians satisfaction towards institutional and governmental support

The impact of organisational settings on physician well-being was previously studied by von Vultée *et al* who found that organisational support improved work satisfaction and mental energy and reduced work-related exhaustion among physicians.³⁶

To reduce the established widespread transmission in the community in Qatar, the government has followed a mitigation strategy starting in March 2020. This included cancelling public gatherings, schools and universities closure, online learning, working from home, telemedicine and dedicating a group of hospitals and health centres for the care of COVID-19 infected patients. Primary care physicians' satisfaction with institutional and governmental regulations was the highest among other aspects of local COVID-19 management, with three-quarters of participating physicians being satisfied with these regulations. Reducing working hours and permitting work from home as well as the temporary holding of on-site education were moderately associated with this satisfaction with a statistical significance.

Our findings on the impact of organisational factors on physicians' satisfaction were comparable to a study by Yu *et al* in China, who concluded that the recent improving level of job satisfaction among frontline medical staff fighting against COVID-19 was attributed to the Chinese governmental regulations that improved working conditions of healthcare workers and shouldered COVID-19 associated treatment costs.³⁷

This is the first population-based study among primary care physicians in Qatar assessing their satisfaction towards local COVID-19 management. The level of satisfaction was measured and analysed to identify factors of satisfaction about several aspects of COVID-19 management, including CPG, psychological support, team dynamics, work safety as well as institutional and governmental regulations.

This study has several limitations. First, the response rate (65%) was lower than desired. In addition, as a cross-sectional study, the level of satisfaction was measured during a certain period (June to July 2020) which might have changed over the subsequent months. Moreover, primary care physicians with stronger feelings, with or against, COVID-19 management may have been more likely to respond to the survey. The participants were working in a primary healthcare corporation that could be considerably different from other physicians working

in Qatar. Future studies incorporating physicians from both public and private sectors and involving all levels of healthcare should be undertaken. Finally, we used a questionnaire to collect subjective responses from participants, which could be improved in future studies by using objective tools for satisfaction assessment.

Based on the results of this study, several recommendations could be made for healthcare policymakers to improve primary healthcare physicians' satisfaction during this challenging stage of their career, and for any future public health crises. First, healthcare managers need to proactively take steps to identify the needs of primary care physicians who are younger or family medicine-trained and involve them more in decision-making about local COVID-19 management. Family medicine educational programmes should include an enhanced practical training on emergency response, stress management training, in addition to raising physicians' awareness on burnout. Moreover, female physicians' requirements for psychological support during health crises should be identified and addressed to improve their work experience.

The second recommendation is that CPG should be clear, applicable with a sound scientific background. They also should undergo periodic modification according to practicing physicians' feedback. As the information on COVID-19 is rapidly evolving, primary care physicians should be continuously updated on the emerging evidence using effective communication channels, which will help to assure them that they are providing patient care with the most updated knowledge. Third, to promote the psychological well-being of primary care physicians, several essential interventions are required including positive team dynamics, having effective communication with managers, and reinforcing the role of supervisors in addressing physicians' concerns.

The fourth recommendation would be for health institutions to provide the necessary resources to protect primary care physicians, ensure sufficient supplies of PPE with internationally standardised quality, and maintain a safe working environment to achieve and sustain physicians' satisfaction towards their safety. Finally, the collaborative strategy between different levels of leadership in the country has resulted in the highest satisfaction rate among primary care physicians in Qatar which should be reflected in future health plans for any public health emergency.

Supporting primary care physicians in all the aspects of COVID-19 management is crucial for sustaining a strong public health system during the current pandemic, and to retain and encourage primary care physicians' involvement in future epidemics.

Updates on COVID-19 situation in Qatar

On 1 June 2021, almost 1 year after the study period, Qatar has started to recover from the second wave of COVID-19, with a total number of 218 080 confirmed cases and 563 deaths. Up to this date, more than 2.6 million doses of the

COVID-19 vaccine have been administered to the population of Qatar.

Primary healthcare corporation continued to be the main provider of primary healthcare in Qatar by integrating virtual healthcare services for non-urgent conditions, operating urgent walk-in clinics, and contributing significantly to the community vaccination programme.

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Patient consent for publication Not applicable.

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Data availability statement All data relevant to the study are included in the article or uploaded as supplementary information.

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