

Perceptions and stress factors among physicians in pre-graduate and post-graduate training in Morocco: COVID-19 pandemic context

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ABSTRACT

Context: On 30 January, 2020, WHO stated that the global COVID-19 epidemic is a public health emergency. Facing this critical situation, health-care workers were at risk of developing psychological distress and other mental health problems.

Aims: This study seeks to explore the feelings, attitudes and perceptions of the COVID-19 pandemic among physicians in pre-graduate and post-graduate training from Marrakesh University Hospital Centre.

Methods and Material: We conducted a cross-sectional study with internal and resident-physicians in May 2020. Data collection was based on a self-administered electronic questionnaire. The sociodemographic informations, pandemic impact on the occupational and social fields and stress factors were evaluated. Statistical significance was set at $p < 0.05$.

Results: The number of participants was 74. The sex ratio was 1.4 with an average age of 26.1 ± 3.6 years. Two-thirds were directly involved in the management of patients with SARS-CoV2. The majority reported that their work puts them at high-risk of exposure to SARS-CoV2 and 66% felt stressed at work, female physicians were more stressed than men ($p = 0.028$). Not knowing when the pandemic will be under control and the risk of developing an infection with SARS-CoV2 were the main sources of stress. About motivators for similar situations, respondents emphasized family support (91.9%) and recognition by management and supervisors for the additional efforts they provide (83.8%).

Conclusions: The protection of health-care workers is an important component of public health measures to combat this pandemic. Special interventions to promote health-care workers mental well-being must be implemented immediately.

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1. Introduction

In March 2019, the World Health Organization declared that coronavirus disease (COVID-19) can be classified as a pandemic [1]. Therefore, the world is facing the challenge of managing a little-known high contagious viral disease. The state of health emergency has led to a shift from patient centred medicine to a community-based and population-based approach [2,3]. All over the world health-care systems were quickly reorganized to cope with the crisis, to optimize human and material resources and to minimize the spread of the infection.

In Morocco, two major Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV2) outbreaks have been spread mainly in the cities of Marrakesh, Casablanca and Tangier. The first one between March and August the second one between October and December 2020 [4]. During these outbreaks, many cases occurred among health-care workers, some of them have even died.

Health-care workers are on the front line of the COVID-19 epidemic response. In addition to the increased risk of coronavirus infection these workers are exposed to psychological distress, fatigue, burnout due to long hour shifts, stigma, physical and psychological violence [5,6]. Besides this the depletion of personal protective equipment and the lack specific medicine caused another problem [7]. All of these factors were alarming and potentially distressing for hospital staffs who worked during the outbreak.

Residents and internal doctors represent a particular population because of their special status as doctors in training ‘graduate students’ and physicians in practice. They represent 29.9% of all staff at the University Hospital Centre of Marrakesh [8,9]. This challenging epidemic environment has disturbed their activities essentially to COVID-19 patient’s management. It disrupted and interrupted their training.

In this critical context, understanding the fears, anxieties and reactions of internal and resident physicians seems important and will help design better

personal and family support for them in order to better control the infection. The aim of this work was to explore the feelings, attitudes and perceptions related to the COVID-19 pandemic among the internal doctors and residents of the Marrakesh's University Hospital.

2. Subjects and methods

We conducted a cross-sectional study among doctors in pre-graduate training 'internal doctors' and post-doctoral training 'resident doctors' at the University Hospital of Marrakesh during the first week of May 2020.

On the basis of literature review [10–14], a structured and self-administered electronic questionnaire was developed. After testing the questionnaire, assessing its clarity and comprehensibility in a group of five doctors, participants were invited to complete the questionnaire through the internal and resident physician associations (Association of Internal Doctors of Marrakesh 'AMIMA' and Association of Resident Doctors of Marrakesh 'ALMOQUIM').

The questionnaire included two parts. The first part contained sociodemographic characteristics of participants (age, marital status, training level) and the degree of involvement in COVID-19 patient management (first or second line). Participants were asked whether they were directly involved in clinical activities of diagnosis, treatment, or care of

patients at high temperature or patients with confirmed COVID-19 were defined as the first line, and those who answered negative were defined as the second line workers. The second part consisted of five main sections: 1) the impact of the pandemic on the professional/training field, 2) the impact of the pandemic on the social field, 3) the sense of control of the pandemic, 4) stressful factors, 5) adaptation strategies and motivational factors. Each question in these sections was measured using a 5-points Likert scale (1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree). The impact of the COVID-19 pandemic on medical training was assessed on a scale of 0 to 10 (0 none impact and 10 significant impact).

The data collected were computerized on an Excel spreadsheet and analysed using SPSS software (Statistical Package for Social Science) version 16.0. Qualitative variables were represented as frequencies and percentages. Quantitative variables were represented by mean and standard deviation or median and interquartile range. Means differences were compared with the Mann–Whitney U test. Statistical significance was considered at $p < 0.05$.

Confidentiality and anonymity rules were respected when collecting and analysing data. Participation was free and voluntary. According to the moroccan law on bioethics, ethics committee's opinion was not sought since it is an opinion poll without human intervention [15].

Table 1. Internal and resident doctors' sociodemographic characteristics ($n = 74$).

Characteristics		Effective (<i>n</i>)	Percent (%)
Gender	Female	42	56,8
	Male	32	43,2
Family Situation	Single	55	74,3
	Married	19	25,7
Status	Internal Doctor	46	62,2
	Resident Physician	28	37,8
Residence year	1st	7	25,0
	2nd	5	17,9
	3rd	5	17,9
	4th	7	25,0
	5th	4	14,3
Current housing	Hotel	35	47,3
	Alone	29	39,2
	Family	8	10,8
	Collocation	2	02,7
Degrees of involvement in COVID –19 patients care	First line	51	69,9
	Second line	23	31,1
Hospital service	COVID Services	34	45,9
	COVID emergency	39	52,7
	COVID intensive care units	4	05,4
	Normal Services	35	33,8
	Normal emergency	40	54,1
Impact of the pandemic on training	Negative	67	90,5
	Positive	07	09,5
Working hours per week	Less than 40 hours	45	60,8
	More than 40 hours	29	39,2

3. Results

3.1. Sociodemographic characteristics

A total of 74 physicians responded to the questionnaire (response rate of 8%). The average age was 26.1 ± 3.6 years with a sex ratio (female/men) of 1.3. Internal physicians accounted for 62.2% and 32.2% of resident physicians were at the end of their specialization (4th year for medical specialty and 5th year for surgical option). More than two-thirds (69.9%) were on the front lines with a median working hours per week of 35 hours (24–62). Participants sociodemographic characteristics are presented in Table 1.

3.2. Impact of the pandemic on areas of focus

3.2.1. Impact of the pandemic on the professional/training area (Table 2)

The majority considered that their work puts them at high-risk of exposure to SARSCoV-2 (97.3%) and 70.3% expressed fear of being infected. Work stress was reported by 66.2%, female physicians were more stressed than men (Likert score average 4.1 vs 3.5 with $p = 0.028$). Regarding the medical training component, 90.5% considered that the pandemic had a negative impact on training with a mean of 7.5 ± 2.6 (no impact difference between internal and resident $p = 0.363$).

3.2.2. The social impact of the pandemic (Table 2)

Half of the physicians (51.4%) felt they may transmit the virus to their family members. Only 4.1% thought

their families would not care for them if they were infected. The majority (77%) of respondents disagreed that people would avoid them and their families because of the higher risk of infection associated with their work. However, almost 23% of physicians reported that they were avoiding talking to their families about this potential higher risk.

3.2.3. Pandemic control feeling (Table 3)

On a scale of 1 to 10, the level of preparation of participants was 4.8 ± 2.5 . There was no difference between internals and residents 5.2 vs 4.1, $p = 0.096$, and only 39.2% attended training sessions on controlling SARS-CoV2 infection. A percentage of 31.1% stated that the hospital has a clear plan to manage the outbreak.

3.2.4. Stress factors (Table 4)

The main stressors were the lack of a sense of control over the pandemic (64,9%), risk of contracting SARS-CoV2 infection (63.5%), staff shortages 43% (internal 3.2 vs resident 2.5 $p = 0.006$), lack of equipment 53% (women 3.4 vs men 2.8 $p = 0.029$).

3.2.5. Adaptation strategies and motivation factors (Tables 5 and 6)

The main factors contributing to stress reduction were the improvement of the patient's condition (85.1%), family/friends were not affected by SARS-CoV2 (83,8%) and availability of protective equipment in the hospital (78.7%).

Table 2. Impact of the pandemic on the professional/training area and social impact.

	All participants	Status		p	Gender		p
		Internes	Residents		Woman	Man	
	Likert's score	Average (SD)			Likert's score		
					Average (SD)		
Impact of the pandemic on work area							
My work puts me at great risk of exposure to COVID-19	4.6 (0.5)	4.6 (0.5)	4.6 (0.6)	0.591	4.6 (0.5)	4.6 (0.6)	0.77
I'm afraid of being infected with COVID-19	3.9 (0.9)	3.9 (1.0)	4.0 (0.7)	0.786	4.1 (0.8)	3.8 (1.0)	0.231
The risk to which I am exposed is unacceptable	3.2 (0.9)	3.3 (0.9)	3.1 (1.1)	0.271	3.3 (0.8)	3.2 (1.2)	0.713
I'm confident my hospital would take care of me if I ever got the disease	2.9 (1.2)	2.8 (1.1)	3.1 (1.3)	0.335	2.9 (1.2)	3.0 (1.3)	0.621
There is more conflict between colleagues at work	3.2 (1.2)	3.4 (1.1)	2.8 (1.2)	0.038	3.2 (1.2)	3.1 (1.0)	0.683
I feel more stressed at work	3.9 (1.1)	4.0 (1.0)	3.6 (1.1)	0.077	4.1 (0.9)	3.5 (1.2)	0.028
Impact of the pandemic in social domain							
I feel like I'll pass on SARS-CoV2 to my family	3.0 (1.2)	2.8 (1.3)	3.3 (1.2)	0.05	3.0 (1.2)	3.0 (1.3)	0.906
I feel that my family members have been avoiding me since the beginning of the pandemic	2.4 (1.2)	2.3 (1.2)	2.5 (1.2)	0.515	2.4 (1.2)	2.3 (1.1)	0.786
I'm afraid my family won't take care of me if I get infected	1.7 (0.8)	1.6 (0.8)	1.7 (0.9)	0.552	1.8 (0.9)	1.5 (0.8)	0.167
I will not tell my family or friends if I have been infected	1.9 (1.0)	1.9 (1.1)	1.9 (1.0)	0.971	1.9 (1.0)	1.9 (1.1)	0.788
I'm afraid to talk to my family about the risk I'm exposed to	2.5 (1.1)	2.6 (1.2)	2.3 (1.0)	0.187	2.6 (1.1)	2.4 (1.2)	0.693

SD: standard deviation

Table 3. Sense of control of the pandemic.

	All participants		Status		Gender		
	Likert's score (SD)	Average (SD)	Residents (SD)	<i>p</i>	Woman	Man	<i>p</i>
					Likert's score (SD)	Average (SD)	
I have been trained in controlling SARS-CoV2 infection	3.0 (1.4)	3.2 (1.1)	2.7 (1.2)	0.074	3.1 (1.1)	2.8 (1.1)	0.153
In our hospital we have enough staff to control the infection	3.0 (1.3)	2.5 (1.2)	3.8 (1.0)	0.001	2.7 (1.2)	3.3 (1.3)	0.04
Our hospital has a clear plan to deal with the outbreak	2.8 (1.1)	2.8 (1.1)	2.7 (1.0)	0.712	2.9 (1.0)	2.7 (1.2)	0.403
I have received adequate training in personal protective equipment	2.7 (1.2)	2.9 (1.2)	2.5 (1.3)	0.133	2.8 (1.1)	2.7 (1.4)	0.71
I'm prepared to help control the epidemic	2.9 (1.2)	3.0 (1.2)	2.8 (1.2)	0.334	3.1 (1.2)	2.8 (1.2)	0.237
I am confident in the current infection control measures	3.1 (1.1)	2.9 (1.2)	3.4 (1.1)	0.133	2.9 (1.1)	3.3 (1.2)	0.151

SD: standard deviation

Table 4. Stress factors for you in this pandemic context.

	All participants		Status		Gender		
	Likert's score (SD)	Average (SD)	Residents (SD)	<i>p</i>	Woman	Man	<i>p</i>
					Likert's score (SD)	Average (SD)	
Seeing patients with SARS- Cov2 die	3.2 (1.1)	3.2 (1.1)	3.3 (1.0)	0.82	3.4 (1.0)	3.0 (1.2)	0.064
Not knowing when the pandemic will be under control	3.2 (1.2)	3.1 (1.3)	3.3 (1.1)	0.787	3.1 (1.3)	3.3 (1.1)	0.887
Risk of acquiring SARS- CoV2 infection	3.3 (1.1)	3.2 (1.2)	3.4 (0.9)	0.979	3.3 (1.1)	3.3 (1.1)	0.593
Conflict between your duty and your own security	3.2 (1.1)	3.2 (1.2)	3.4 (0.9)	0.511	3.3 (1.1)	3.2 (1.0)	0.516
Seeing your stressed or scared colleagues	3.3 (1.0)	3.3 (1.1)	3.4 (0.9)	0.823	3.5 (0.9)	3.1 (1.1)	0.186
Lack of adequate protection measures	2.9 (1.1)	3.0 (1.1)	2.8 (1.1)	0.412	3.0 (1.1)	2.8 (1.1)	0.299
Wearing daily protective equipment	3.0 (1.1)	2.9 (1.2)	3.2 (0.9)	0.608	3.1 (1.1)	2.9 (1.1)	0.356
Staff shortages	3.0 (1.1)	3.2 (1.0)	2.5 (1.2)	0.006	3.3 (1.1)	2.5 (1.0)	0.001
Equipment shortage	3.1 (1.2)	3.4 (1.1)	2.8 (1.3)	0.025	3.4 (1.0)	2.8 (1.3)	0.029

SD: standard deviation

The main motivating factors for dealing with similar situations were family support (91.9%) and recognition by management and training supervisors for the additional effort provided (83.8%).

4. Discussion

Health-care workers are at high-risk of contamination and also face an increased risk of mental health problems in the face of pandemics such as COVID-19 [16]. In China at the end of March 2020, 3,000 health workers were infected and at least 22 died [17]. During the same period in Italy, 18% of all health-care workers tested had positive result for COVID-19. It suggests that the contagion likely occurs during work (89%) [18]. This may explain some of the fear that health care workers can understand. This pandemic had a negative impact on mental health of 90% of the participants in a study conducted with

neurosurgery residents [19]. In our study, 70.3% of physicians were afraid to be infected. A feeling of stress at work was reported by a significant number of participants, especially among women. This finding has also been reported by other authors particularly when working in isolation services and intensive care units where patients are severely ill and have difficulty breathing [20]. According to another study in China, being a woman was associated with severe symptoms of depression, anxiety and distress [21]. In Wuhan, China, a cross-sectional survey of 5,062 health workers found that 24.1% of health workers reported symptoms of stress, depression, and anxiety especially among women (Hazard ratio [HR], 1.31; $p = 0.032$). This may be explained by the fact that women pay more attention to the inner experience and to personal feelings which are related to women's biological, psychological and social factors [22].

Other major stressors in our study were related to the lack of awareness of when the pandemic will be

Table 5. The factors that have (or will) help reduce your stress.

	All participants		Status		Gender		
			Internes	Residents	Woman	Man	
	Likert's score (SD)	Average (SD)			Likert's score (SD)	Average (SD)	<i>p</i>
Positive attitude of colleagues in your department	3.7 (1.1)	3.6 (1.1)	3.8 (0.7)	0.74	3.7 (1.0)	3.7 (0.9)	0.885
Improved health of affected patients	4.0 (0.8)	4.0 (1.0)	4.1 (0.6)	0.868	4.1 (0.8)	3.9 (0.9)	0.26
Healing your infected colleagues	4.0 (0.8)	3.9 (0.9)	4.1 (0.6)	0.517	4.1 (0.8)	3.8 (0.8)	0.09
Hospital provided protective equipment	3.9 (1.0)	3.7 (1.1)	4.2 (0.6)	0.106	4.0 (1.0)	3.7 (1.0)	0.094
Clear hospital prevention guidelines	3.7 (1.1)	3.7 (1.2)	3.7 (1.1)	0.821	4.0 (1.0)	3.4 (1.3)	0.067
Your family/friends were not affected by SARS-CoV2	4.1 (0.8)	4.0 (1.0)	4.3 (0.6)	0.461	4.3 (0.8)	3.9 (0.9)	0.062
Decrease in cases of SARS-Cov2 reported in the news.	3.9 (0.9)	3.9 (1.0)	4.0 (0.7)	0.752	4.1 (0.9)	3.7 (0.9)	0.026
Probability of getting additional compensation for your exposure to SARS-CoV2	3.7 (1.2)	3.6 (1.2)	3.9 (1.2)	0.268	3.6 (1.3)	3.8 (1.2)	0.512
Confidence in hospital staff in case of SARS-CoV2 disease	3.5 (1.1)	3.5 (1.1)	3.7 (1.0)	0.303	3.5 (1.0)	3.6 (1.1)	0.657
Accommodation in hotels	3.4 (1.1)	3.5 (0.9)	3.1 (1.3)	0.263	3.6 (1.1)	3.2 (1.1)	0.127
Psychological support listening cell	3.3 (1.1)	3.3 (1.1)	3.3 (1.1)	0.892	3.5 (1.0)	3.0 (1.1)	0.06
Not taking an additional workload	3.6 (1.1)	3.6 (1.1)	3.6 (1.0)	0.685	3.7 (1.1)	3.5 (1.1)	0.543

SD: standard deviation

Table 6. Motivation factors for coping with similar situations.

	All participants		Status		Gender		
			Internes	Residents	Woman	Man	
	Likert's score (SD)	Average (SD)			Likert's score (SD)	Average (SD)	<i>p</i>
Provision of adequate personal protective equipment by the hospital	4.2 (1.0)	4.1 (1.0)	4.4 (0.9)	0.17	4.4 (0.8)	4.0 (1.1)	0.153
Family support	4.3 (0.8)	4.1 (0.9)	4.5 (0.5)	0.186	4.4 (0.8)	4.1 (0.9)	0.175
Compensation for work-related illness	4.0 (1.2)	4.0 (1.1)	3.9 (1.3)	0.901	4.1 (0.9)	3.9 (0.9)	0.903
Financial recognition of efforts	4.1 (1.1)	4.2 (1.1)	4.1 (1.2)	0.795	4.2 (0.9)	4.0 (1.3)	0.873
Management and Supervisor recognition for additional efforts	4.1 (1.2)	4.1 (1.2)	4.2 (1.2)	0.46	4.3 (0.9)	3.8 (1.4)	0.236
Psychiatric assistance and therapy available in the workplace to help reduce stress and anxiety	3.9 (1.1)	4.0 (1.1)	3.8 (1.1)	0.462	4.2 (0.8)	3.5 (1.3)	0.017
Work shift respected	4.1 (1.0)	4.2 (1.0)	3.9 (1.0)	0.15	4.2 (0.8)	3.8 (1.2)	0.186

SD: standard deviation

under control also the risk of contracting SARS-CoV2 infection and the limited availability of protective equipment required. In 2017, a study done in Saudi Arabia in a similar epidemic context related to MERS-CoV among resident doctors, stress was related to personal safety, colleagues and family. Indeed, the unpredictability of the pandemic's evolution and the stress generated by the media put pressure on health workers who then feel anxious to preserve their health and that of their family [12].

It should be noted that only 39.2% attended training sessions on infection control and on a scale of one to 10, the level of preparedness of internal and resident doctors was 4.8 ± 2.5 . The same sense of unpreparedness was reported by a study in Brazil where 57.7% said they did not consider themselves prepared [23].

With regard to the impact of the COVID-19 pandemic on the physician's training, the quality of in-residence training has been negatively affected by the

recent pandemic. Our results suggested that 90% felt a negative impact. This result has been reported by other studies. A multicentre transverse study (Canada, Kuwait, Saudi Arabia, Serbia, Italy and the USA) among residents of neurosurgery. Most of them (98.1%) reported that their hospital training was affected by the pandemic [19]. In France, the same finding was found in a national survey among residents in urology [24].

In our study, we have a response rate of 8% which could be explained by the pandemic context, the high workload, the modification of the organization and hospital services and the context of containment. Motivating factors to cope this epidemic and similar situation must include: family support and recognition by management and supervisors for the additional efforts made by this population of physicians in training. Psychological and other same interventions have been carried out. For example, China implemented measures such as the provision of adequate equipment to staff by the hospital, the prior training of staff in the care and management of patients infected with SARS CoV-2, the establishment of a clear and simplified action plan and finally the support and psychological care of caregivers [25]. A similar system of support and listening was established by the psychiatric service of University Hospital Centre of Marrakesh. However, because of the great need in hospitalized patients, it was dispensed mainly for the COVID-19 patients. The institution's social and logistical support reduces the levels of stress, anxiety and depression among caregivers [].

The teams' participatory reorganization with coherent supervision, debriefing times lead to reducing the professional stress [26].

The development of defence mechanisms, adaptation and management of anxiety should be established continuously during and out of the pandemic context. Group communication strategies and the creation of a distraction environment would be recommendations to avoid burn-out and work stress among doctors in training. WHO and public health authorities around the world are taking action to contain the spread of the COVID-19 pandemic. However, this period of crisis creates stress in the population. Protecting professionals against COVID-19 is an important element in maintaining patient care and continuity of care.

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Data availability

All data supporting the findings of this study are included in the paper; however, details of the full data may be obtained from the corresponding author on request.

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