

KNOWLEDGE, ATTITUDES AND PRACTICES RELATED TO COVID-19 AMONG HEALTH PROFESSIONALS IN EL JADIDA PROVINCE, MOROCCO

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ABSTRACT

Background. During the COVID-19 pandemic, concerns were raised about the lack of knowledge and awareness of health workers (HW) in hampering the implementation of COVID-19 preventive strategies in hospitals.

Objective. This cross-sectional study aims to explore the knowledge, attitudes, and practices (KAP) of the health workers related to COVID-19 in Moroccan hospitals and health facilities.

Materials and methods. We administered an adapted questionnaire to 242 HW working in Azemmour and El Jadida hospital (two sites) and in 41 health centers in El Jadida province. We carried out a bivariate analysis and used contingency tables and logistic regression models to identify factors associated with different KAP levels.

Results. We found that 90.1%, 8.3% and 60.3% of HW had respectively high levels of knowledge, risk perception attitudes and preventive practices towards COVID-19. High level of knowledge was associated with gender (OR: 0.267; 95% CI: 0.113-0.634; $p=0.002$), and professional profile ($p<0.001$). Levels of attitudes were associated with gender (OR: 17.143; 95% CI: 5.450-53.932; $p<0.001$) whereas levels of preventive practices were associated with position of the HW in COVID-19 (frontline or not frontline) (OR: 0.404; 95% CI: 0.236-0.691; $p=0.001$) and the overworked status of the HW (OR: 0.421; 95% CI: 0.242-0.730; $p=0.002$).

Conclusion. Professionals' knowledge and practice levels were higher than their COVID-19 risk perception attitudes. Therefore, efforts should be made to improve the attitudes of health professionals.

Key words: *knowledge, attitude, practice, coronavirus disease 2019, Covid-19, health care workers*

INTRODUCTION

Coronavirus disease 2019 (COVID-19) was declared on 30 January, 2020 by the World Health Organization (WHO) as an international public health emergency. On 11 March 2020, it quickly spread as a global health pandemic [11, 24, 32, 38, 40]. Managing the consequences of COVID-19 pandemic requires resilient health systems that are capable of adapting to diverse global political, economic, social and health systems challenges [25, 28]. Building resilient health systems requires qualified, motivated, and knowledgeable human resources for health (30, 34, 35, 43).

Frontline healthcare workers are considered to be at high risk of contracting and spreading COVID-19 within healthcare facilities [23, 30, 33, 35]. They suffered from increased occupational health risks (extended working hours, stress, burnout, and fatigue) with an impact on their mental health and psychological well-being [4, 16, 20, 23, 30, 34, 36, 42]. Consequences of increased occupational health risk are increased rate of medication errors, staff injuries (13,18) delayed diagnosis. In addition, poor compliance of health workers [22, 27] with COVID 19 control and preventive measures is responsible for increased HW contamination and spread of COVID-19 in healthcare facilities [10, 29, 34]. This was attributed to lack of

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knowledge and awareness of HW about COVID-19 prevention and protective measures [22, 27].

In Morocco, concerns were raised about the lack of knowledge and awareness of HW about COVID-19 measures in hampering the implementation of COVID-19 preventive strategies in hospitals and primary health care. However, limited attention has been placed to measuring the knowledge, attitudes and practices of health workers regarding COVID-19 prevention and control measures. This study aimed at filling this gap by measuring COVID-19 related knowledge, attitudes and practices of health professionals in El Jadida Province in Morocco.

MATERIAL AND METHODS

Method

We conducted a cross-sectional study between 1 and 30th November to 2021, in El Jadida health province, Casa Settat region, Morocco.

Setting

The province of El Jadida is among the provinces that recorded the highest number of cases of COVID-19 in the Casablanca Settat Region in Morocco. El Jadida health province serves a population of 847 994 inhabitants mostly living in rural areas. The provincial health system comprises a provincial hospital center 360 of beds (Azemmour and El Jadida hospital) and 41 health centers, including 29 rural health centers.

Target population and sampling

Our total population of health workers comprises 650 health professionals (doctors, nurses). To calculate our sample, we use STATCALC. We selected a sample of 241 participants with CI of 95%. We adopted a random sampling strategy to select participants.

Data collection methods and tools

To measure the extent of COVID-19 related knowledge of HW, we constructed our questionnaire on the basis of World Health Organization [41] guidelines and two previous validated scales [9, 43]. We collected data using an adapted questionnaire that comprising 17 items measuring the levels of knowledges, risk perception attitudes and preventive practices (KAP) of HW regarding COVID-19. Each response was scored “1” as correct and “0” as incorrect, with scores ranging from 1 to 7. We set a threshold at a score of 5. Below 5 health workers knowledge about COVID-19 was scored as low. Above 5, knowledge about COVID-19 was considered to be high.

We measured risk-perception attitudes by items such as “level of fear of COVID-19”, “confidence in defeating the virus” and “feelings of fatigue”. Responses were formulated on a Likert scale and then

ranked on a dichotomous “yes” or “no” scale. One point was assigned to a yes response and zero points to a no response, with score ranging from 0 to 4 points. Attitude level ≤ 2 was considered to indicate a low level of COVID-19 risk perception, whereas a level > 2 was considered a high level of COVID-19 risk perception.

HW preventive practices were assessed by four questions related to “their participation in training workshops”, “use of personal protective equipment (PPE)”, “use of WHO guidelines for hand washing and practices related to quarantine” and “isolation of patients with COVID-19”. Each response was scored as “1” correct and “0” incorrect, with scores ranging from 1 to 4. A practice level ≤ 2 was considered to indicate low preventive practices against COVID-19, whereas a level > 2 was considered high preventive practices against COVID-19.

Operational definitions

Frontline health workers: are professionals directly involved in the prevention and treatment of COVID-19 and having direct contact with confirmed or suspected cases via patient intake, screening, inspection, testing, transport, treatment, nursing, specimen collection, pathogen detection, pathological examination, or pathological anatomy of medical and health care professionals and technical personnel.

Overworked status: in this study, healthcare professionals were considered to be overworking if they worked more than an average of 8 hours per day in the previous week.

Statistical analysis

We first performed a descriptive analysis using frequencies categorical variables. We then performed a bivariate analysis to assess the association between the variables using means in contingency tables, using odds ratio (OR) with 95% CI confidence interval. Significant associations are considered if the p value less than 0.05. We finally performed a binary logistic regression to identify factors associated with different levels of COVID-19 related knowledge, risk perception attitudes and preventive practices. We used SPSS version 20 for data analysis.

Ethical considerations

The study respected the ethical considerations, in this case: having the permission and agreement of those in charge of the study environment; having the consent of the participants, after having explicitly communicated to them the purpose and objectives of the research as well as the fate of the information given; openness; transparency and respect towards the participants and guaranteeing their anonymity and confidentiality. The agreement is obtained from

the Ethics Committee for Biomedical Research of the Faculty of Medicine and Pharmacy of the University Mohammed V Rabat, (M/21).

RESULTS

In this study we aimed at exploring the levels of COVID-19 related the knowledge, attitudes and practices of health professionals regarding COVID-19 among 242 HW in the province of El Jadida. In the following sections, we will present the sociodemographic characteristics of study participants, their respective levels of COVID-19 knowledge, attitude, and practices.

Characteristics of study participants

Socio professional characteristics of study participants are listed in Table 1. 76% of the participants were female (CI 95%: 70.7-81.4), with a male sex ratio of 24%. Nurses represents 75.2% of participants (CI 95%: 70.2-80.6) followed by physicians 19.8% (CI 95%: 15.3-24.8) then 3.3% of administrators and 1.7% of technicians. The majority of HW had more than nine years of professional experience (81%), 15.7% of participants had between five and nine years of professional experience, and 3.3% of professionals had less than five years of experience. Frontline health professionals during the COVID-19 pandemic were 62.8%. Finally, about two-thirds of the participants in the study had burnout during COVID-19 (67.8%), while 32.2% of the participants did not.

COVID-19 related knowledge

90.1% of the participants had a high level of knowledge about COVID-19. Of the participants with a high level of knowledge, 8 out of 10 (78.9%) were female. The bivariate analysis presented in Table 2

shows statistically significant association between gender and the level of knowledge (OR: 0.267; CI: 95%: 0.113-0.634; $p=0.002$).

Doctors participating in the study presented the highest level of knowledge (95.83%) followed by nurses (91.75%) and technicians (75%) and then administrators (50%). The bivariate analysis revealed that the association between the participants' profile and the level of knowledge was statistically significant ($p<0.001$).

The majority of HW with a high level of knowledge had more than nine years of professional experience (82.1%), followed by professionals with five and nine years of experience (15.1%) and finally professionals with less than five years of experience (2.8%).

Two-thirds of HW with a high level of knowledge were frontline professionals during the COVID-19 pandemic (66.5%) while one-third of the professionals were not front-line (33.5%) with an OR of 0.523 (CI of 95%: 0.188-1.456). 61.5% of HW with a high level of knowledge, were overworked (OR: 0.532; CI 95%: 0.203-1.393).

Three quarters of HW participated in conferences about COVID-19 (73.6%). They also consulted official government websites (75%), news and media (69%), family members and colleagues (80%) and social networks (62%).

COVID-19 related attitudes

91.7% of HW had a low level of COVID-19 risk perception attitude while only 8.3% of HW had a high level COVID-19 risk perception attitude. The majority of female HW (97.82%) had a low level of COVID-19 risk perception attitude, as did male professionals (72.41%). The association between gender and attitude level was statistically significant ($p<0.001$).

Table 1. Socio-demographic and professional characteristics of participants

Socio-demographic and professional variables		Workforce	Percentage %	CI at 95%
Gender	Male	58	24	18.6-29.3
	Woman	184	76	70.7-81.4
Profile	Doctor	48	19.8	15.3-24.8
	Nurse	182	75.2	70.2-80.6
	Administrator	8	3.3	1.2-5.8
	Technician	4	1.7	0.4-3.3
rofessional experience	<5 years	8	3.3	1.2-5.8
	5 < 9 years	38	15.7	10.7-20.2
	>9 years	196	81	75.6-86.0
Position in Covid-19	Frontline HW	152	62.8	56.6-69.0
	Not Frontline HW	90	37.2	31.0-43.4
Overworked status	Yes	164	67.8	62.0-73.6
	No	78	32.2	26.4-38.0

Table 2. Association between variable and level of knowledge, level of attitudes and level of practice

Socio-demographic and professional variables		Level of knowledge			Level of attitudes			Level of practice					
		Low	High	OR (CI 95%)	P value	Low	High	OR (CI 95%)	P value	Low	High	OR (CI 95%)	P value
Gender	Male	12 (50%)	46 (21.1%)	1 0.267 (0.113-0.634)	0.002	42 (18.9%)	16 (80%)	17.143 (5.450-53.932)	<0.001	28 (29.2%)	30 (20.5%)	1 1.592 (0.878-2.898)	0.124
	Woman	12 (50%)	172 (78.9%)			180 (81.8%)	4 (20%)			68 (70.8%)	116 (79.5%)		
Profile	Doctor	2 (8.3%)	46 (21.1%)			44 (19.8%)	4 (20%)			14 (14.6%)	34 (23.3%)		
	Nurse	15 (62.5%)	167 (76.6%)			168 (75.7%)	14 (70%)			76 (79.2%)	106 (72.6%)		
	Administrator	4 (16.7%)	4 (1.8%)		<0.001	6 (2.7%)	2 (10%)			4 (4.2%)	4 (2.7%)		0.380
	Technician	3 (12.5%)	1 (0.5%)			4 (1.8%)	0 (0%)			2 (2.1%)	2 (1.4%)		
Professional experience	<5 years	2 (8.3%)	6 (2.8%)			8 (3.6%)	0 (0%)			4 (4.9%)	4 (2.7%)		
	5<9 years	5 (20.8%)	33 (15.1%)		0.244	34 (15.3%)	4 (20%)			10 (10.4%)	28 (19.2%)		0.168
	>9 years	17 (70.8%)	179 (82.1%)			180 (81.1%)	16 (80%)			82 (85.4%)	114 (78.1%)		
Position in Covid-19	Frontline HW	19 (79.2%)	145 (66.5%)	1 0.523 (0.188-1.456)	0.208	140 (63.1%)	12 (60%)	1 0.879 (0.345-2.238)	0.786	48 (50%)	104 (71.2%)	1 0.404 (0.236-0.691)	0.001
	Not Frontline HW	5 (20.8%)	73 (33.5%)			82 (36.9%)	8 (40%)			48 (50%)	42 (28.8%)		
Overworked status	Yes	18 (75%)	134 (61.5%)	1 0.532 (0.203-1.393)	0.193	154 (69.4%)	10 (50%)	1 0.442 (0.176-1.110)	0.076	54 (56.3%)	110 (75.3%)	0.421 (0.242-0.730)	0.002
	No	6 (25%)	84 (38.5%)			68 (30.6%)	10 (50%)			42 (43.7%)	36 (24.7%)		

About three quarters of the professionals with high attitude level were nurses (70%), followed by doctors (20%) and finally administrators (10%). Professionals with a high level of COVID-19 risk perception attitude had more than nine years of experience (80%). The majority of frontline professionals had a low level of attitudes (92.1%), while 7.9% of frontline professionals had a high level of COVID-19 risk perception attitude (OR: 0.879; CI 95%: 0.345-2.238) indicating a protective significance between professional position and level of attitudes.

50% of HW with a high COVID-19 risk perception attitude level had overwork (OR: 0.442; CI 95%: 0.176-1.110) indicating protective significance ($p=0.076$).

COVID-19 related practices

60.3% of professionals had a high level of COVID-19 preventive practice while 39.7% had a low level of COVID-19 preventive practices. Female HW had a high level of COVID-19 preventive practices (63.04%) compared to male professionals (51.72%). HW with a high level of practice were nurses (72.6%) and doctors (23.3%).

78.1% of HW with a high level of COVID-19 preventive practices had more than nine years of professional experience. The proportion of health professionals with a high level of knowledge and occupying the first line during the COVID-19 pandemic was 71.2%. The association between the position of professionals during COVID-19 and the level of practice was statistically significant (OR: 0.404; CI 95%: 0.236-0.691; $p=0.001$).

Finally, the professionals with a high level of COVID-19 preventive practices and developing an overworked status were 75.3%. The association between overworked status and practice level was

statistically significant (OR: 0.421; CI 95%: 0.242-0.730; $p=0.002$).

Logistic regression and potential risk factors

Binary logistic regression analysis of knowledge level in Table 3 predicted that male gender was a risk factor for low knowledge level five times more than female gender (adjusted OR: 5.205, CI 95%: 1.786-15.174). Participants' work experience of less than five years was a risk factor for low knowledge ten times more than work experience of more than nine years (adjusted OR: 10.865, CI 95%: 1.694-69.664). Work experience between five and nine years was a risk factor for low knowledge three times more than work experience greater than nine years (adjusted OR: 3.254, CI 95%: 0.813-13.020).

The different professionals' profiles participating in the study illustrated by physicians (adjusted OR: 0.12, CI 95%: 0.001-0.184), nurses (adjusted OR: 0.54, CI 95%: 0.005-0.601) and administrators (adjusted OR: 0.593, CI 95%: 0.35-10.055) were protective factors for COVID-19 knowledge level.

Binary logistic regression of the level of COVID-19 risk perception attitudes in Table 4 predicted that male gender (adjusted OR: 0.058, CI 95%: 0.19-0.183) was a protective factor for the level of COVID-19 risk perception attitude. Binary logistic regression of preventive practice level in Table 5 predicted that frontline health professional position (adjusted OR: 2.309, CI 95%: 1.336-3.990) and professional burnout status (adjusted OR: 2.196, CI 95%: 1.250-3.859) were factors emphasizing practice level.

Table 3. Predictors of professionals' knowledge of COVID-19

Socio-demographic and professional variables		Wald's statistics	p value	Adjusted OR (95% CI)
Gender	Male	9.134	0.003	5.205 (1.786-15.174)
Profile	Doctor	18.228	<0.001	0.12 (0.001-0.184)
	Nurse	10.084	0.001	0.54 (0.005-0.601)
	Administrator	5.642	0.018	0.593 (0.35-10.055)
	Technician	0.131	0.718	-
Professional experience	<5 years	7.395	0.025	10.865 (1.694-69.664)
	5<9 years	6.331	0.012	3.254 (0.813-13.020)
	>9 years	2.782	0.095	-

Table 4. Predictors of the level of attitudes regarding the perception of COVID-19 risks by professionals

Demographic variables		Wald's statistics	p value	Adjusted OR (95% CI)
Gender	Male	23.619	<0.001	0.058 (0.19-0.183)

Table 5. Predictors of the level of professional practices with respect to COVID-19

Professional variables		Wald's statistics	p value	Adjusted OR (95% CI)
Position in Covid-19	Frontline health professional	8.989	0.003	2.309 (1.336-3.990)
Overwork status	Yes	7.479	0.006	2.196 (1.250-3.859)

DISCUSSION

This study allowed us to explore the knowledge, attitudes, and practices of health professionals related to COVID-19 in El Jadida Province, Morocco. The analysis of health professionals' knowledge and factors affecting their attitudes and practices may be a starting point to design prevention strategies to reduce the spread of the pandemic among health professionals [43].

This study showed that this study revealed that health professionals had a high level of knowledge about COVID-19. This was consistent with similar studies conducted in China, Egypt, Vietnam, Pakistan, Uganda, Iran, and Nigeria that showed that health care workers had a high level of knowledge about COVID-19 [2, 17, 21, 26, 33, 37, 43]. Nevertheless, other studies have reported a low level of knowledge among health care professionals [9, 30].

The results of this study demonstrated the significant association between gender and the level of knowledge about COVID-19. In addition, the analysis allowed us to categorize male gender as a risk factor for low COVID-19 knowledge level. Our research, in line with other researchers [2, 10, 21, 43] found a significant association between the professional profile and the level of knowledge. Doctors have highest Covid-19 related knowledge than nurses and administrators. Other studies showed no significant difference between the levels of knowledge and the different professional profiles.

This study showed the status of frontline health professionals significantly increased their level of knowledge. This finding was supported by other studies that argued that being in direct contact with COVID patients made health professionals more motivated to learn about the disease and to seek scientific materials and guidelines [2, 43].

This study highlighted, in line with other studies [2, 3, 35, 43, 44] the importance of HW experience, the seniority and age of the HW gaining higher level

of COVID-19 related knowledge. These findings support the widely held assumption that greater age and professional experience lead practitioners to adopt a rational, evidence-based approach to dealing with any situation [6].

In addition, this study showed similarly to other studies [2, 7, 9, 16, 17, 26] that the most used sources of information by HW were official government websites followed by news and media and social networks. Other scholars reported other sources of information such as the WHO (7,26), seminars and workshops [1].

This study found that the majority of HW had low levels of COVID-19 risk perception attitude in contrast to their knowledge levels, with no significance between the two levels. This support the assumption having knowledge about COVID-19 and actual attitude are not necessarily correlated [1]. In practice, knowledge is not considered to be determinant in the development of COVID-19 risk-perceived attitudes [4,31,39]. These contrasts with finding from other studies that found, in other settings, a significant association between the level of knowledge and the level of risk perception attitudes of COVID-19 (2,3,9,17,21,26,33,37,43,44)

Our research highlighted, in line with other studies [43], the significant association between the position of the professionals and their longer professional experience (over 9 years) and their level of preventive practice.

This study showed, in line with *Zhang et al.* [43], the association between the level of COVID-19 practice and their working time. In summary, knowledge may lead to better practices [30, 35] but could not be considered as the driver of health workers attitudes and behaviors. Thus, policy makers need not to rely only on COVID-19 continuing education programs [14] to change the attitudes and behaviours of health workers. They need to develop supervisory practices and evaluation in real world settings [8, 12, 19].

Limitation: The study was conducted in a single hospital in Morocco, so the generalizability of the results is limited.

CONCLUSION

Successful management of any pandemic requires an adequate level of knowledge, a high level of risk perception attitude, and an appropriate level of evidence-based practice. The knowledge levels and practice levels of the professionals were higher than their Covid-19 risk perception attitudes. Therefore, efforts should be made to improve the attitudes of health care professionals.

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Declaration of conflict of interest

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