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# The impact of COVID-19 on the quality of life of southern Moroccan doctors : A gender-based approach



## *L'impact du COVID-19 sur la qualité de vie des médecins du sud du Maroc : une approche par le genre*

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### INFO ARTICLE

Historique de l'article :

Reçu le 25 octobre 2020

Accepté le 14 avril 2022

Disponible sur Internet le 6 juin 2022

Keywords :

Quality of life

Doctors

COVID-19

WHOQOL-Brief

Mots clés :

Qualité de vie

Médecins

COVID-19

WHOQOL-Bref

### ABSTRACT

**Objectives.** – After the World Health Organisation (WHO) declared COVID-19 a global pandemic, various countries took preventive health measures to limit the spread of the coronavirus. The quality of life (QOL) of many populations was affected by lockdown and social distancing. The pandemic increased healthcare professionals' workload and decreased doctors' QOL. Our study aimed to evaluate the QOL of doctors in southern provinces of Morocco during the COVID-19 pandemic. In addition, the study compared QOL of the two genders at that time.

**Methods.** – This was a cross-sectional and descriptive study. The sample included 257 doctors practicing in the southern provinces of Morocco. To assess QOL, we used the online self-administered WHOQOL-BREF questionnaire, which evaluates QOL in four domains: physical, mental, social and environmental. The cut-off between good and poor QOL was 60.

**Results.** – All doctors showed poor QOL in all domains. The mean scores and standard deviations for the physical, mental, social, and environmental domains were  $57.88 \pm 17.12$ ,  $57.09 \pm 20.13$ ,  $55.57 \pm 23.66$  and  $47.99 \pm 17.34$ , respectively. Comparing the two genders, males had a higher QOL than females with a statistically significant difference ( $p$ -value  $\leq 0.05$ ) in all domains. Both men and women had poor QOL in the environmental domain (less than 60). Doctors who worked directly in the COVID-19 circuit had poorer QOL in all domains. Even with scores lower than 60, males working in COVID-19 circuit had better QOL compared to females, except in the social domain.

**Conclusion.** – Southern Moroccan doctors' QOL was reduced in all domains. All doctors working in COVID-19 circuit had poor QOL, and women's scores were even lower than those of men.

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### R É S U M É

**Objectif.** – Après que l'Organisation mondiale de la santé a qualifié la COVID-19 de pandémie mondiale, plusieurs pays ont adopté des mesures préventives pour limiter la propagation du virus. La qualité de vie de plusieurs populations a été affectée par ces mesures, notamment par le confinement et la distanciation sociale. La pandémie a augmenté la charge de travail des professionnels de santé, ce qui pourrait avoir altéré la qualité de vie des médecins. L'objectif de notre travail était d'évaluer la qualité de vie des médecins exerçant dans les provinces du sud du Maroc durant la pandémie de COVID-19 et de comparer la qualité de vie entre les médecins hommes et les médecins femmes.

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*Design de l'étude.* – Etude transversale descriptive.

*Méthodes.* – Nous avons inclus 257 médecins travaillant dans les provinces du sud du Maroc. Nous avons utilisé un questionnaire en ligne auto-administré via Google Forms. Pour évaluer la qualité de vie, nous avons utilisé le WHOQOL-Bref, un questionnaire qui évalue la qualité de vie dans quatre domaines : physique, mental, social et environnemental. Le score limite entre meilleure et mauvaise qualité de vie était fixé à 60.

*Résultats.* – Tous les médecins avaient une qualité de vie médiocre dans tous les domaines. Les scores moyens et les déviations standards dans les domaines physique, mental, social et environnemental étaient respectivement ( $57,88 \pm 17,12$ ), ( $57,09 \pm 20,13$ ), ( $55,57 \pm 23,66$ ) et ( $47,99 \pm 17,34$ ). En comparant les deux sexes, les hommes avaient une meilleure qualité de vie par rapport aux femmes dans tous les domaines, avec une différence statistiquement significative ( $p$ -value  $\leq 0,05$ ). Dans le domaine environnemental, les hommes et les femmes avaient une qualité de vie altérée (moins de 60). Les médecins qui travaillaient directement dans le circuit COVID-19 avaient une pauvre qualité de vie dans tous les domaines. Même si les hommes travaillant dans le circuit COVID-19 avaient des scores inférieurs à 60, ils avaient une qualité de vie meilleure que les femmes à l'exception du domaine social.

*Conclusion.* – La qualité de vie des médecins exerçant dans les provinces du sud du Maroc était diminuée dans tous les domaines. Les médecins travaillant dans le circuit COVID-19 avaient une pauvre qualité de vie, et les scores des femmes étaient plus bas que ceux des hommes.

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## 1. Introduction

At the end of 2019, an outbreak of pneumonia was reported in Wuhan, Hubei Province, China [1]. This emergent infectious disease was due to the severe acute respiratory syndrome known as coronavirus-2 (SARS-CoV-2) [2]. On March 11, 2020, the World Health Organization (WHO) declared this outbreak a global pandemic [3]. Since then, different countries around the globe have taken health measures to limit transmission and spread of the virus. In Morocco, containment was applied on March 20, 2020. While it was certainly a measure with a positive nationwide impact on the course of the pandemic, it had many consequences on the quality of life (QOL) of the population.

The WHO defines QOL as “the individual's perception of his (her) position in life, in the context of culture and value systems in which he (she) lives and in relation to his (her) goals, expectations, standards, and concerns” [4]. QOL is an important dimension nowadays. Its application is increasing in both the medical dimension and health research. Medically, QOL has three application domains : clinical research, public health, and daily medical practices [5]. There are several indices used in the literature to evaluate QOL [5,6]. The WHO-QOL-Brief, adopted in this study, is one of the instruments validated by WHO and used in many countries.

QOL is an important predictor of overall health and well-being [7]. The COVID-19 outbreak affected the lives of people all over the world. Many studies have measured the impact of COVID-19 on the QOL of general populations and patients in particular. The pandemic had negative impacts on the physical, social and psychological well-being of individuals. It also affected the global economy [8]. Social distancing and preventive measures influenced people's daily activities and well-being. Epifanio and al. studied QOL in an Italian population and highlighted significant differences among individuals depending on sex, area of residence and whether they had a medical or psychiatric disease [9]. The pandemic also affected the QOL of patients with chronic disease. The presence of COVID-19 patients in hospitals affected the access of chronic disease patients to healthcare services [10]. COVID-19 also altered the health of adolescents and children, and increased risks of mental disorders [11]. Finally, in most studies focused on caregivers, the pandemic had a major impact on their QOL and psychological health [12–14].

Given the nature of their work, doctors are subject to burdensome workloads and aggravated stress, which impair their QOL [15]. In Morocco, according to the latest statistics of the Moroccan health ministry, the number of patients per doctor is 1725 (all sectors combined) [16]. This rate helps to explain doctors' burdens. A factor such as COVID-19 can make their tasks even less readily manageable, and alter their QOL.

In Morocco, as in other countries, women, especially working women, have domestic as well as professional responsibilities, and the combination can alter their QOL. In Kuwait, in a study involving 2562 employees, females were shown to have a lower QOL compared to males [17] ; in addition, due to their daily domestic chores as well as socioeconomic differences, in many countries they enjoy less leisure time than men. More precisely, while men practice physical activity in leisure time because they enjoy doing so, women tend to practice with for either health improvement or esthetic reasons [18]. In the medical profession, women are not spared. While medicine used to be a male-dominant profession, female physicians are now entering most specialities. Morocco has more women than men in medical school, and “feminization” rose from 20 % in the 1970s to more than 60 % nowadays [19]. Female doctors still have career challenges that increasing their anxiety and depression levels and decreasing their QOL scores [20]. In medical schools, women with parenting responsibilities endure major obstacles in their academic careers. Compared to men with children, women are less frequently published, and present with slower self-perceived career progress, and lower career satisfaction [21]. In a recent review, the authors explain how women working in academic contexts continue to suffer from inequality. Being employed and earning an income, they are also expected to take on primary responsibility for the care of their family and home life. Moreover, in the culture of higher education, women must frequently ‘fit in’. They must make additional efforts to be equal to men and there is no consideration of the additional burdens entailed by their household responsibilities [22].

To our knowledge, no study has assessed the QOL of doctors during the COVID-19 pandemic in Morocco. The purpose of our study is to fill this gap. It aims to evaluate the QOL of the physicians during the current pandemic. It also aims to compare QOL between the two genders.

## 2. Methods

### 2.1. Study design and setting

We conducted a cross-sectional, observational and descriptive study over the period between May and June 2020. This study focuses on physicians working in the Southern provinces of Morocco : Souss-Massa, Guelmim-Oued-Noun, Laayoune-Sakia-Lhamra and Dakhla-Oued-Dahab. These four regions represent 11% of the total population of Morocco with nearly 4 million inhabitants. According to 2007 statistics, the poverty rate in this region was 14.1% compared to national level of 9 %. The number of doctors in southern Morocco is insufficient. Medical density approximates 4 doctors per 10 000 inhabitants,

significantly lower than the national average (7 doctors/10 000 inhabitants) [16,23,24].

The inclusion criteria were as follows : any general practitioner or specialist practicing in southern Morocco during the current COVID-19 pandemic and the data collection period.

## 2.2. Data collection

This was an online self-administered questionnaire, using the Google Forms platform. We used WhatsApp to send a link to our targeted sample. Either a specialist or a general practitioner in each hospital was in a WhatsApp group, facilitating communication and patient care. Via professional WhatsApp groups, doctors participated in the study. They also invited and encouraged their colleagues to join in.

After consent, medical doctors had access to the auto-administered questionnaire. The questionnaire contained two parts. The first included sociodemographic, medical experience and professional conditions. The second included the French version of the World Health Organization Quality Of Life- BREF (WHOQOL-BREF) [25].

## 2.3. Explanatory variables

### 2.3.1. COVID-19 circuit

In order to evaluate the impact of COVID-19 on QOL, we had two groups, doctors who were “working in COVID-19 circuit” and doctors who were “not working in COVID-19 circuit”. Working in COVID-19 circuit meant working in the circuit of patients with suspected or confirmed COVID-19 infection : triage, sampling, hospital services (suspected or confirmed cases) and intensive care units.

### 2.3.2. Practice area

In our study, we distinguished between two categories of physicians. Those working in the public sector under the supervision of the ministry of health, as opposed to independent physicians (those working in their own practices or clinics, liberal or private sector).

Other collected variables were marital status because of the different responsibility burdens of married doctors compared to single ones. In addition, doctor profiles (specialist or general practitioner) were considered.

## 2.4. WHOQOL-BREF questionnaire

The WHOQOL-BREF is a brief version of the original WHOQOL-100 questionnaire (supplementary material 1). It contains 26 items (Q1 to Q26) : two general questions (Q1 and Q2) measure general perception of QOL and health-related QOL respectively. The other 24 questions comprise four domains [26] :

- Domain 1 : physical health (Q3, Q4, Q10, Q15, Q16, Q17, Q18). These questions evaluate activities in daily living, dependence on drugs and medical aids, energy and mobility, pain and discomfort, getting enough sleep and rest, and work capacity.
- Domain 2 : psychological health (Q5, Q6, Q7, Q11, Q19, and Q26). This domain is about experience of the body image and appearance, negative and positive feelings, self-respect, spirituality, religion, personal beliefs, thinking, learning, memory and concentration.
- Domain 3 : social relationships (Q20, Q21, Q22) evaluating personal relationships, social support, and sexual activity.
- Domain 4 : environmental health (Q8, Q9, Q12, Q13, Q14, Q23, Q24, Q25). This domain covers financial resources ; freedom, physical security and safety ; health and social care (accessibility and quality) ; home environment ; opportunities for new information and skills ; participation and opportunities for recreation/leisure ; and physical environment (pollution, noise, traffic, climate, and transport).

In our study, we used the validated French version of WHOQOL-BREF [17]

## 2.5. Scoring and interpretation of the WHOQOL-BREF [26]

In the scoring of the WHOQOL-BREF, each item is rated on a five-point Likert scale from one to five. Questions 1 (Q1) and 2 (Q2) are examined separately. Domain scores are scaled in a positive direction ; higher scores denote higher QOL. The mean score of items for each domain is used to compute the domain score. Mean scores are then multiplied by 4 in order to deduce domain scores. To interpret the results, the score is transformed into a score between 0 and 100 comparable with the scores used in the WHOQOL-100. Scoring tables are presented in supplementary material 2.

To interpret mean scores, we chose 60 as the cut-off between poor and good QOL. This choice is based on a comparison of different norms of WHOQOL-BREF scores in Arabic and non-Arabic countries. We used 60, which is the norm in countries with resources similar to Morocco [27–31].

The Cronbach's alpha coefficient was calculated to evaluate the degree of internal consistency among the items [32]. The overall Cronbach's alpha coefficient of the WHOQOL-BREF questionnaire is 94.7 %.

## 2.6. Statistical analysis

The Google Forms platform generates an Excel file including the answers. Data and statistical analysis were performed using the SPSS for Windows software package (ver. 13.0 ; SPSS Inc., Chicago, IL, USA). All variables were reported either as mean  $\pm$  standard deviation for continuous variables or frequency and percentage for categorical variables. The Chi-square test ( $\chi^2$ ) or Fisher's exact test was performed to examine the differences in proportions of categorical variables between the two groups. Student t test was used to compare QOL between different groups.

In order to compare the different dimensions of QOL, we chose to stratify, in addition to gender, the fact of working or not working in the COVID-19 circuit. A  $p$ -value  $\leq 0.05$  was considered statistically significant.

## 3. Results

### 3.1. Sample characteristics

Out of 500 administered questionnaires, 257 were completed and returned with a response rate of 51.4 %. The mean age was  $40 \pm 9$  years. Out of all respondents, 153 (59.5 %) were female and 104 (40.5 %) were male (Table 1).

Among the respondents, 208 (80.9 %) were married, 39 (15.2 %) were single and 10 (3.9 %) were divorced ; 147 (57.2 %) were specialists, 89 (34.6 %) were general practitioners and 21 (8.2 %) were medical residents. Of the doctors, 91 (35.4 %) were working in COVID-19 circuit.

### 3.2. Quality of life

The overall QOL item was reported to be good by 80 (31.1 %) of participants and very good by just four (1.6 %). Most respondents (105 (41 %)) considered their QOL neither poor nor good. For the overall health-related QOL item, 97(38 %) participants were satisfied with their health while 68 (26.5 %) were dissatisfied.

The physical health domain had the highest overall score while the environmental domain had the lowest overall score. All doctors had significantly poor QOL.

Comparing genders, all domains were significantly higher for male doctors compared to female doctors ( $p \leq 0.05$ ). Males had good

**Table 1**  
Sample characteristics.

	All (n = 257) n (%)	Female (n= 153) n (%)	Male (n= 104) n (%)	p-value
<b>Marital status</b>				0.32
Single	39 (15.2)	25 (16.3)	14 (13.5)	
Married	208 (80.9)	120 (78.4)	88 (84.6)	
Divorced	10 (3.9)	8 (5.2)	2 (1.9)	
<b>Profile</b>				0.72
General practitioner	89 (34.6)	56 (36.6)	53 (31.7)	
Specialist	147 (57.2)	85 (55.6)	62 (59.6)	
Resident	21 (8.2)	12 (7.8)	9 (8.7)	
<b>Practice area</b>				0.88
Public	189 (73.5)	112 (73.2)	77 (74)	
Private	68 (26.5)	41 (26.8)	27 [26]	
<b>Working in COVID-19 circuit</b>				0.030
Yes	91	46 (50.5 %)	45 (49.5 %)	
No	166	107 (64.5 %)	59 (35.5 %)	
<b>Quality of life (mean score ± SD)</b>				
Physical domain	57.88 ± 17.12	56.07 ± 17.5	60.55 ± 16.281	0.039
Mental domain	57.09 ± 20.13	54.57 ± 20.43	60.79 ± 19.19	0.015
Social domain	55.57 ± 23.66	52.17 ± 24.426	60.55 ± 21.68	0.005
Environmental domain	47.99 ± 17.34	46.29 ± 17.16	50.48 ± 17.38	0.05

QOL in the physical, mental and social domains. However, both males and females had poor QOL in the environmental domain.

Doctors working in the COVID-19 circuit had significantly poor QOL in all domains compared to doctors working in the normal circuit with a statistically significant difference (Table 2).

Males working in the COVID -19 circuit had better QOL in all domains compared to females with a statistically significant difference, except in the social domain (Table 3). Both males and females scored less than 60 in all domains with relatively lower scores in COVID-19 circuit workers. This means that working in the COVID -19 circuit affected their QOL.

Regarding doctors not working at the COVID-19 circuit, males always had a good QOL except in the environmental domain. Even when outside of the COVID-19 circuit, women had an altered QOL, especially in the social field, and the difference was very significant.

#### 4. Discussion

Our results show that all of the participating doctors reported poor QOL. By gender, women had a lower QOL in all domains except for the environmental, in which both males and females had poor QOL. In addition, our study found that doctors working in the COVID-19 circuit had significantly poorer QOL compared to doctors not doing so.

For further insights into these results, we would have liked to consult other studies on QOL in Morocco. However, there are few such studies. Using the SF-36 scale, Elamrani et al. conducted a study in northern Morocco and showed that the population in that region had poor QOL [33–35]. Nevertheless, no study using the WHOQOL-Brief scale has assessed QOL either in the general population or in physicians. Even though the dialect version of this questionnaire was

validated by Khali et al. for patients with breast cancer, the results cannot be generalized to Moroccan doctors [36].

Doctors in our study had poor QOL in all domains. Workload, staff shortage and work responsibilities could explain this alteration. L. YB Wei et al. suggested that research work and promotion challenges were the two most considerable sources of stress and poor QOL for Chinese doctors. Three factors affected the physical domain : gender, research work, and promotion challenges. Research work and promotion challenges also impacted the psychological domain, while in the social domain, only research work was found to be salient. In the environmental domain, work years, medical environment, and promotion challenges were the three affecting factors. Given the economic and technological take-off of China, especially the huge advances in modern medicine, Chinese doctors have had to redouble their efforts. Besides daily clinical work, they often have to deal with extensive research work, their objective being to get promoted and paid well. This situation negatively impacts their QOL [37].

In our study, while we did not evaluate factors associated with poor QOL, we used a gender approach to assess the influence of sex on QOL. Females were found to have a poorer QOL than males, except in the environmental domain.

This difference can be explained by the extra responsibilities of women in housekeeping and child rearing ; it is not specific to Morocco [33–35], but also applies to women in other countries [21]. In Brazil, female internal medicine residents had a poorer QOL and lower scores than their male counterparts, which may be associated with poor time management, feeling guilty of being away from family, having less time for leisure, and increased workload-related stress compared to male doctors [20]. The gender difference among medical students has also been confirmed in several studies, which have shown that males always have a better QOL, especially in the physical domain [37–40].

Although women doctors are educated and financially independent, they still have poor QOL. As mentioned above, promotion challenges are a factor of alteration, and can contribute to a gender difference in QOL because of the gender gap in scientific advancement. This was well-explained in recent work showing gender inequalities in the authorship of submissions during the pandemic period. Another factor cited to explain this difference was geographical location, especially in Africa, and the socio-cultural norms in countries where women have more domestic responsibilities than men [41].

Because of the pandemic, physicians working in the COVID-19 circuit had an additional workload, and in our study, they were

**Table 2**  
Comparison of mean QOL scores among doctors working and doctors not working in COVID-19 circuits.

	Working in COVID-19 circuit	Not working in the COVID-19 circuit	p-value
Physical domain	53.44 ± 16.09	60.31 ± 17.23	0.002
Mental domain	51.78 ± 21.8	59.9 ± 18.59	0.003
Social domain	51.12 ± 22.37	58.03 ± 24.06	0.025
Environmental domain	42.02 ± 17.57	51.26 ± 16.36	< 0.001

QOL : Quality of life.



**Table 3**  
QOL of doctors working or not in COVID-19 circuit according to gender.

	Not working in COVID-19 circuit			Working in COVID-19 circuit		
	Female (n=107)	Male (n=59)	p	Female (n=46)	Male (n=45)	p
Physical domain	58.85 ± 16.89	62.97 ± 17.66	0.14	49.59 ± 17.34	57.38 ± 13.82	0.02
Mental domain	58.27 ± 18.38	63.12 ± 18.73	0.10	45.96 ± 22.49	57.73 ± 19.58	0.009
Social domain	53.94 ± 23.93	65.37 ± 22.69	0.003	48.09 ± 25.30	54.22 ± 18.70	0.19
Environmental domain	49.85 ± 15.76	53.81 ± 17.23	0.13	38.02 ± 17.59	46.11 ± 16.78	0.02

QOL : Quality of life.

found to have poorer QOL. The lowest QOL scores were among females. Many studies have illustrated the psychological impact of COVID-19 and its burnout effect among health care workers, especially women. This pandemic was particularly unpleasant for female medical practitioners. For female nurses for example, work in emergency departments during the COVID-19 outbreak increased depression, which decreases QOL. Nurses in emergency departments were required to work more hours, after which they had 14 days of mandatory quarantine, which exacerbated their feelings of anxiety and guilt due to the social stigma conferred on their families. Nurses also experienced fear of being infected and spreading the virus to their families and friends [42–44]. Married nurses with children, working in the front line with infected patients had poor QOL [45].

Doctors working in COVID-19 conditions developed psychiatric symptoms such as anxiety and sleep disturbance, possibly affecting their problem-solving skills and causing a deterioration in their QOL. These findings confirm the negative impact of COVID-19 on QOL of physicians and all health care professionals [11–14,46]. To evaluate factors explaining this situation using the WHOQOL-Brief scale, Hong-He Zhang measured depression and its relation with QOL among frontline psychiatric clinicians during the COVID-19 pandemic. He found that clinicians with depression had lower QOL compared to those without depression. Factors associated with high odds of depression were higher educational level, having more than 500 local COVID-19 patients, having infected family members, friends or colleagues, smoking and longer job experiences [47].

In our study, the response rate was of 51.4 %, different from other studies with response rates as low as 14 % [48,49]. The use of social media platforms can explain this high response rate. WhatsApp provided an opportunity to reach out to a heightened proportion of the targeted group. During the pandemic, online platforms and telecommunication were commonly used in daily activities, facilitating sharing of the questionnaire with other doctors. While technology like the WhatsApp platform helps to increase response, a study among Chinese urologists received an even higher response rate (86 %), and no explanation was mentioned [37]. Females represented more than half (59.5 %) of our survey sample. Remegio et al. likewise had a predominance of female responses (88.9 %), and most responders were nurse leaders, who had poor QOL [50]. Feminization of medicine can be one explanation [51]. And yet, even though the WHO described the feminization of medical studies worldwide as early as 2006 [52], and in spite of the predominance of women in Moroccan medical schools, female doctors represented only 40% of general practitioners and specialists in southern Morocco [19].

To conclude, we may suppose that the high participation of females in our sample can be explained by their motivation. In the title of our questionnaire, we mentioned the study's focus on doctors' QOL. Women may indeed feel a highly acute alteration in their QOL, which may indeed have motivated them to participate in the survey.

#### 4.1. Limitations and strengths

This is the first study to investigate the QOL of physicians in southern Morocco using the WHOQOL-brief score. In addition, the use of technology and WhatsApp contributed to a satisfactory rate of response.

Despite these strengths, this study had two limitations. First, our survey was limited to southern Morocco, which has a particularly poor medical density, so we could not generalize the results. Second, because of the survey design, a convenience sample with a self-administered web questionnaire, measurement of QOL might have been biased. For example, if individuals who felt the most concerned by altered QOL participated more than others did, our measurement of the importance of poor QOL would be over-estimated.

#### 5. Conclusion

In summary, this study is the first to evaluate the QOL of doctors in southern Morocco, during the COVID-19 pandemic. Physicians have responsibilities and various factors may affect their QOL. With a pandemic situation such as COVID-19, QOL is negatively affected. Female QOL scores were lower than those of males. The situation is the same among people working in the COVID-19 circuit. We need additional studies on Moroccan population for further insight into our results.

#### Ethical approval

The manuscript describes a non-interventional study, participants signed consent to participate in the study to access the auto-questionnaire, and there was no need for ethical approval.

#### Funding

No funding resources to declare.

#### Declaration of Competing Interest

None declared.

#### Acknowledgments

We thank the AFMS (Association des Médecins Femmes du Sud), association of women doctors in southern provinces of Morocco for participating in the survey.

Special thanks to Mouhssine Yassine for his contribution to language revision of the manuscript.

#### Supplementary materials

Supplementary material associated with this article can be found in the online version at doi : 10.1016/j.respe.2022.04.004.

