

Original Research

The influence of coronavirus / COVID-19 pandemic on the behavior and attitudes of health professionals at the National Cancer Institute in Rabat/Morocco

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Submitted: 02 May 2021

Accepted: 04 June 2021

Published: 07 June 2021

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OPEN ACCESS**Keywords**

- Coronavirus
- Caregivers
- Stress
- Pandemic and oncology

Abstract

Objectives: COVID-19 pandemic puts all healthcare professionals under extreme pressure, by necessity and duty. Because of containment measures, they are obliged to manage suspected patients as well, or others who are suffering from this emerging disease too. The main objective of this study is to describe the effect of the Coronavirus / COVID-19 pandemic on the behavior and attitudes of health professionals at the National Cancer Institute in Rabat, Morocco.

Materials and Methods: It is a descriptive and epidemiological study which has been observed on a particular day at the National Cancer Institute in Rabat. The target population is represented by health professionals (doctors and nurses) working in this institution.

Data was collected using an online survey, after participants' acceptance. Data analysis was executed using statistical software IBM SPSS statistics version 24.

Results and Discussion: Within all participants, 60 (54%) were doctors and 52 (46%) were nurses. The number of professionals assigned to COVID-19 sector was 30 (27%). Fatigue and stress represent the most frequent manifestations among participants with a respective percentage of 57% [CI: 47.98% - 66.31%] and 69% [CI: 61.13% - 78.16%]. Health professionals who work in the COVID-19 sector suffered significantly from sleeping insomnia more than those who work in the non-COVID-19 sector (63.33% versus 32.93%, $p = 0.004$). They also had a pessimistic vision of the future compared to their colleagues in the non-COVID-19 sector (33% versus 14%, $p = 0.03$). Female participants suffered more than men in terms of sleep quality and psycho-emotional balance. The change in habits of taking care of cancer patients gave 90% of the participants a feeling of guilt and self-accusation towards the patients.

Conclusions: This study aims to provide indicators on the influence of Covid 19 pandemic on the behavior and attitudes of healthcare professionals working in oncology field. These indicators can be used as a reference while defining and implementing support measures for health professionals when they resume their normal activity in the post-pandemic period.

INTRODUCTION

Since December 2019, the world has been affected by an emerging infectious disease linked to the rapid development of a new coronavirus, SARS-CoV-2 (Severe Acute Respiratory Syndrome Corona Virus 2). It is potentially responsible for a severe respiratory syndrome, not only that but for a multi-organ failure also which can lead to death. Since that time, the spread of coronavirus disease (COVID-19) in numerous countries outside China has led the World Health Organization (WHO) to consider this disease as a pandemic [1]. In the evening of March 2, 2020, The Moroccan Health Ministry announced the first case of

Covid-19 in Morocco, three months after the start of the epidemic in China. On 1 of May 2021, Morocco has crossed the threshold of 510000 contaminated cases with 73914 cases in Rabat [2]. It is the world health crisis in our time, it puts the populations of different countries under pressure, thus it generates psycho-social, economic and political crises. The early work on the psychosocial impact of COVID-19 in China reveals that the epidemic has not affected only the body, but also the minds, especially among caregivers who are particularly at risk. In fact, in addition to containment measures, they are obliged to manage suspected or COVID-19 patients, which puts the whole medical

and paramedical community under high tension, by necessity and duty.

Therefore, hospital staff are exposed to physical and psychological stress when managing this public health emergency of international concern in which the workload is bigger and medical staff is exposed to the risk of contamination [3]. Follow-up data suggest that hospital staff, especially doctors and nurses, were more susceptible to psychological disorders after participating in the treatment of SARS patients more than ten years ago [4]. Moreover, a study has demonstrated that 42% of doctors working in tertiary hospitals in continental China have experienced very high levels of accumulated fatigue [5]. So, COVID-19 pandemic (Coronavirus Disease 2019) puts the healthcare system faces new heavy challenges to assume with major decisions to be taken urgently. The massive influx of patients who have to be treated in the hospital with necessity of ensuring the safety of care provided to non-COVID-19 patients leads to a reorganization of oncology care in hospital with the definition of a circuit for suspected patients (COVID circuit) and another for non-suspected patients (non-COVID circuit). This organization has two main objectives: on the one hand, to make the nursing staff as mobilizable as possible. On the other hand, to reduce the risk of contamination among patients as much as possible. The general objective of this study is to describe the influence of Coronavirus / COVID-19 pandemic on the behavior and attitudes of health professionals at the National Cancer Institute in Rabat, Morocco. The secondary objective is to determine the possible risk factors of the influence of Coronavirus / COVID-19 pandemic on participants' behavior.

MATERIALS AND METHODS

This is a descriptive, observational epidemiological study on a given day, conducted at the National Cancer Institute in Rabat. The target population is represented by health professionals (doctors and nurses) working in this institution. Data was collected by using an online survey, after participants' consent. The informations gathered from the literature guided the development of the survey, in a simple way without addressing and detailing specific items (sleep, stress, anxiety). It has been validated by the medical oncology team of the National Cancer Institute. The first section, socio-demographic information is collected for age, sex, profession / years number of experience, marital status and daily / children's management. The second section includes superficial, non-detailed questions about sleeping changes, psycho-emotional state and preventive behavior at home. The third section includes questions assessing the feelings of guilt and fear of being incomplete, caused by this pandemic and by the change in habits of management in oncology.

Data analysis was performed using IBM SPSS statistical software. Statistics version 24. A descriptive analysis was performed for all variables with calculation of the average and standard deviation for the continuous variables and percentages with the calculation of 95% confidence interval for the qualitative variables. Chi-square or Fisher's tests were used for categorical comparisons. The differences were statistically considered significant for a value of $p < 0.05$.

RESULTS AND DISCUSSION

In total, 112 of 200 people contacted responded to the survey, with a participation rate of more than 50%. The average age is 35.5 ± 8.1 years with extremes ranging from 25 to 65 years, 59% were women. Of all participants, 60 (54%) were doctors and 52 (46%) were nurses. About half of persons have their spouse working in

Table 1: Socio-demographic characteristics of the participants (n = 112).

	N	%
Age		
Between 20-30 years	27	24%
30-40 years	58	52%
40-50 years	22	20%
50-60 years	4	3%
60-70 years	1	1%
Gender		
Female	66	59%
Male	46	41%
Function		
Doctor	60	54%
Nurse	52	46%
Specialty		
Medical oncologist	38	34%
Oncologist-radiotherapist	24	21%
Surgeon	18	16%
Resuscitator-anesthesiologist	4	4%
Radiologist	3	3%
Pathologist	4	4%
Gastroenterologist	2	2%
Others	19	16%
Number of years of experience		
Less of 5 years	33	30%
Between 5 et 10 years	46	40%
More than 10 years	33	30%
Family situation		
Married	78	70%
Single	32	28%
Divorced	2	2%
Widowed	0	0,0%
Spouse working in the health sector		
Yes	38	49%
No	40	36%
People affected in the COVID-19 sector		
Yes	30	27%
No	82	73%
Spouse works in the COVID-19 sector		
Yes	17	22%
No	61	78%
Children		
Yes	71	63%
No	41	37%
Number of children		
1	31	44%
2	32	45%

More than 2	8	11%
Infants		
Yes	60	84%
No	11	16%
During containment, children stay:		
With parents	55	77%
Away from parents (with grandparents or relatives)	16	23%
Educational continuity of children		
A full-time parent at home who assures	17	24%
Arrangement between the mother and father when they are both health professionals	10	14%
A relative who manages	9	13%
The person ensures pedagogical continuity after working hours	27	38%
Daily management		
Spouse helps	47	42%
Parents / relatives help	29	26%
A person at home who helps	19	17%

the health sector (49%). The number of professionals assigned to the COVID-19 sector was 30 (27%). Table 1 summarizes the socio-demographic characteristics of the participants as well as the methods of managing the household and / or children during this pandemic period. In this particular context of the pandemic, the hierarchy of care (curative versus palliative, young subjects versus elderly subjects, first line versus second line and beyond) and the modification of habits of care of cancer patients provided 90% of the participants a feeling of guilt and self-blame for the patients, also consultation by telephone in some cases, has resulted some ideas of guilt, fear of being incomplete, sin and remorse or ruin among the majority of doctors interviewed ($n = 47$). Most healthcare professionals (57%, $n = 64$) believe that COVID-19 pandemic may divert our attention from taking care of cancer patients and have a distracting effect.

In addition, this situation impacted sleeping quality in 94% of the participants ($n = 105$) [confidence interval (CI): 89.27% - 98.23%] with the main manifestation "having the feeling of not getting enough sleep" in 48% ($n = 54$) [CI: 38.96% - 57.47%] (Table 2). Fatigue and stress represent the most frequent manifestations found among participants 57% [CI: 47.98% - 66.31%] and 69% [CI: 61.13% - 78.16%].

Healthcare professionals who work in COVID-19 sector suffered significantly from sleeping insomnia more than those who works in non-COVID-19 sector (63.33% versus 32.93%, $p = 0.004$). They also had a pessimistic vision of the future compared to their colleagues in non-COVID-19 sector (33% versus 14%, $p = 0.03$) (Table 3)

Female health professionals suffer more than male participants in terms of sleeping quality and psycho-emotional balance (Table 4).

At the end of the day and after working, 50% of participants in COVID-19 sector limit contact with their family, children and relatives compared to 30% of all people in the non-COVID-19 sector ($p = 0.05$). There was no significant difference between participants from both COVID and non-COVID-19 sectors

regarding fearing of being infected with coronavirus, of infecting patients or those around them. These latter were not increased by colleagues in the COVID-19 sector (Table 5).

As the rest of hospitals in Morocco, the National Cancer Institute in Rabat has mobilized the human means and the necessary material and set up a specific organization to deal with Coronavirus. However, this preparation has been considered as the last resort, because avoiding contact of COVID-19 patients with cancer patients is a top priority. Indeed, many authors have reported that the rate of COVID-19 infection in cancer patients is higher than the general population (1% vs 0.29%) and among infected patients, the risk of developing severe respiratory complications requiring resuscitation care was higher in patients with cancer than in patients without cancer (39% vs 8%, $p = 0.0003$) [6-7-8-9]. A war like this is a call to go beyond all. More than ever, the rules which have to be applied in the field will not always be written and it will call on everyone's judgment and the ability to decide while rigorously assessing the risk / benefit ratio. The decisions on how and when to treat cancer have become difficult. However, the overarching goal remains to provide cancer treatment in the safest and most appropriate way.

In addition, this change in habits in oncology, which is added the feeling of fear from COVID-19 pandemic, has generated a lot of stress in the medical and paramedical community and has tested its adaptability. Previous studies have shown that survivors of acute infectious diseases, such as SARS, can be affected by anxiety, depression, stress, and post-traumatic stress disorder [10,11]. However, there have been few studies on the physical and psychological effects on health professionals, especially when they have the workload additionally to stress associated with the risk of infection [12].

Sleeping quality is a key indicator of physical and mental

Table 2: Impact of COVID-19 on sleeping quality and psycho-emotional balance.

	n	%	IC 95%
Sleeping quality	105	94%	[89,27% - 98,23%]
Sleeping insomnia	46	41%	[31,96% - 50,18%]
Frequent night awakenings	52	46%	[37,19% - 55,67%]
Feeling not getting enough sleep	54	48%	[38,96% - 57,47%]
Nightmares	24	21%	[13,83% - 29,03%]
Use medication to sleep	5	4%	[0,64% - 8,29%]
Psycho-emotional balance	107	95%	[91,71% - 99,36%]
Anger / inner tension	37	33%	[24,32% - 41,75%]
Panic / anxiety attacks	32	28%	[20,2% - 36,94%]
Loss of appetite / tasteless food	24	21%	[13,83% - 29,03%]
Lack of concentration / attention	30	26%	[18,58% - 34,99%]
Tiredness	64	57%	[47,98% - 66,31%]
Stress	78	69%	[61,13% - 78,16%]
Depressed mood / sadness	26	23%	[15,4% - 31,03%]
Pessimism about the future	22	19%	[12,28% - 27,00%]

Table 3: Impact of COVID-19 on sleeping quality and psycho-emotional balance according to the sector of activity.

	Sectors				<i>P value</i>
	COVID-19		Non COVID-19		
	n=30	%	n=82	%	
Sleeping quality	28	93%	77	93%	0.91
Sleeping insomnia	19	63%	27	32%	0.004
Frequent night awakenings	11	36%	41	50%	0.21
Feeling not getting enough sleep	13	43%	41	50%	0.53
Nightmares	5	16%	19	23%	0.45
Use medication to sleep	0	0%	5	6%	0.32
Psycho-emotional balance	30	100%	77	93%	0.32
Anger / inner tension	10	33%	27	32%	0.96
Panic / anxiety attacks	6	20%	26	31%	0.22
Loss of appetite / tasteless food	6	20%	18	21%	0.82
Lack of concentration / attention	7	23%	23	28%	0.61
Tiredness	18	60%	46	56%	0.71
Stress	21	70%	57	69%	0.96
Depressed mood / sadness	8	26%	18	21%	0.60
Pessimism about the future	10	33%	12	14%	0.03

Table 4: Impact of COVID-19 on the sleeping quality and the psycho-emotional balance by gender of health professionals.

	Men (n=46)		Women (n=66)		<i>p-value</i>
	n	%	n	%	
Sleeping quality	42	91%	63	95%	0.37
Sleeping insomnia	18	39%	28	42%	0.72
Frequent night awakenings	16	34%	36	54%	0.03
Feeling not getting enough sleep	24	52%	30	45%	0.48
Nightmares	5	10%	19	28%	0.02
Use medication to sleep	0	0%	5	7%	0.08
Psycho-emotional balance	42	91%	65	98%	0.15
Anger / inner tension	13	28%	24	36%	0.37
Panic / anxiety attacks	8	17%	24	36%	0.02
Loss of appetite / tasteless food	4	8%	20	30%	0.006
Lack of concentration/attention	8	17%	22	33%	0.06
Tiredness	22	47%	42	63%	0.96
Stress	26	56%	52	78%	0.01
Depressed mood / sadness	6	13%	20	30%	0.03
Pessimism about the future	10	21%	10	15%	0.67

health, so good sleeping quality does not only help caregivers work better to treat patients, but it also helps them maintain optimal immune function to prevent 'infection [13,14]. This study suggests that the majority of caregivers (94%) are affected by sleep disturbances, especially frequent night awakenings (46%) and the feeling of not getting enough sleep (48%) (Table 2). In addition, anxiety and stress are commonly experienced by medical staff during epidemics of infectious diseases [15-17]. COVID-19 pandemic has become a stressor, especially it is a new viral infection that has no vaccine and can only be treated symptomatically with 'actual hour. In our study, 69% of

caregivers present stress and 28% anxiety. In addition, several studies have shown that the combination of anxiety and stress affects the quality of sleep since anxious people often have trouble falling asleep and they may wake up frequently during sleep [18]. Moreover, the combination of anxiety and sleep disturbances can make it difficult to fall a sleep [19] and cause tiredness that is seen in 57% of study participants (Table 2).

According to Lai et al. women are more likely than men to have more severe symptoms of depression, anxiety and insomnia (severe anxiety in men compared to women: 10 [3.4%] vs 56

Table 5: Impact of COVID-19 on the behavior and attitudes of health professionals according to activity sector.

	Sectors				p-value
	COVID-19		Non COVID-19		
	n=30	%	n=82	%	
After work, when you get home					
Avoid kissing children / relatives	18	60%	50	60%	0.92
Have a shower	25	83%	62	75%	0.38
Always wear a mask	4	13%	7	8%	0.48
Limit contact with family	15	50%	25	30%	0.05
Degree of fear of being infected with the coronavirus					
Absent	0	0%	0	0%	0.65
Weak	6	20%	11	13%	
Moderate	15	50%	47	57%	
Intense	9	30%	24	30%	
Degree of fear of infecting cancer patients					
Absent	3	10%	1	1%	0.16
Weak	5	16%	12	14%	
Moderate	9	30%	30	37%	
Intense	13	44%	39	48%	
Degree of fear of contaminating the family (parents, spouse, children, etc.)					
Absent	1	3%	3	3%	0.73
Weak	2	6%	3	3%	
Moderate	8	27%	30	37%	
Intense	19	64%	46	57%	

[5.8%]; $p = 0.001$) 20. In our series, this female factor is highlighted significantly in terms of anxiety (8 [17%] vs 24 [36%]; $p = 0.02$), depressed mood (6 [13%] vs 20 [30%]; $p = 0.03$), loss of appetite (4 [8%] vs 20 [30%]; $p = 0.006$), frequent nocturnal awakenings (16 [34%] vs 36 [54%]; $p = 0.03$), nightmares (5 [10%] vs 19 [28%]; $p = 0.02$) and stress (26 [56%] vs 52 [78%]; $p = 0.01$) (Table 4). Also, those involved in the diagnosis, treatment and taking care of patients with COVID-19 directly were associated with a higher risk of symptoms of depression (OR, 1.52; 95% CI, 1.11-2.09; $p = 0.01$), anxiety (OR, 1.57; 95% CI, 1.22-2.02; $p < 0.001$) and insomnia (OR, 2.97; CI 95%, 1.92-4.60; $p < 0.001$) [20]. In general, in our study there was no significant difference between healthcare professionals assigned to COVID-19 sector and those working in non-COVID-19 sector. However, falling asleep insomnia and pessimism about the future affected significantly COVID-19 sector group more (19 [63%] vs 27 [32%]; $p = 0.004$) and (10 [33%] vs 12 [14%]; $p = 0.03$ respectively) (Table 3).

The outbreak of an infectious disease, including COVID-19, can cause anxiety and fear, making us worried about our safety and people around us. Particularly exposed to Coronavirus, healthcare workers fear being infected and thus becoming contaminants for their relatives and patients. In our sample, there was no significant difference between the group working in COVID-19 sector and that in non-COVID-19 sector; this can be explained by the training and information strategy for people dedicated to COVID-19 sector, who were more reassured and prepared (Table 5). However, at the end of the day and after work,

50% of all participants in COVID-19 sector limit contact with their family, children and relatives compared to 30% of all people in non-COVID-sector [19] ($p = 0.05$). Indeed, our insufficient understanding of the pathophysiology of the new coronavirus, its mode of transmission, sensitivity profile and contagious nature as well as the failures of supply chains for personal protective equipment means that the professionals of health must take significant risks compared to the rest of the population [21]. So, they try to balance the duty of taking care of patients with protecting themselves and relatives at the same time [22,23].

In addition to the apparent threats posed by COVID-19 pandemic, both for populations and health systems, this disaster hides other threats such as the distraction effect. Distracting attention to COVID-19 situation may lead exclusively to significant negative implications, especially for cancer patients. Indeed, the reassignment of a certain number of health members, nurses and doctors, to the triage and management of COVID-19 can negatively impact certain vital activities, such as the delay in administration of medical treatment, the postponement of chemotherapy cures [24,25,26], deprogramming non-emergency surgery [27] and shortening the length of hospital stay for patients. This delay can cause localized disease progression, leading to a weak chance to survive. The same risk is present for people who have scheduled examination activities (for example, breast cancer examination mammography). Furthermore, advanced cancers can develop and have a negative impact on survival time and quality of life [28]. Concerning the field of research in oncology, several

conferences are canceled and research essays are stopped. Many institutions, such as the Dana Farber Cancer Institute, have implemented mandatory home telework strategies. However, most of the centers did not establish the same procedures, which is responsible for a certain heterogeneity which can create imbalances in the cohorts of patients in the multicenter essays, and probably bias the results of the ongoing essays [29].

More than half of our questioned professionals (57%, n = 64) think that this COVID-19 pandemic has a distracting effect and it risks diverting our attention from the management of cancer patients.

Wise societies in oncology have issued recommendations for treatment following this pandemic. They were intended to protect cancer patients and harmonize oncological practices between the various care structures. These recommendations are based on three axes, namely the prevention of contamination, the prioritization of care and the organization of patient care by establishments [30,31,24]. Faced with changes in oncology habits and the risk that a patient will suffer, deteriorate clinically or die, many healthcare professionals will find it very difficult to refuse or delay the management of patients due to their own reaction human and professional standards to save lives, relieve suffering and not abandon patients [21]. This situation rises ideas of guilt, fear of being incomplete, sin, remorse and ruin, especially in facing the prioritization of populations and pathologies in curative therapeutic strategy [30]. Especially for patients who develop COVID-19 disease, treatment of this infection will be a priority and the treatment for cancer may be delayed, although such decisions should be made on a case-by-case basis and not only on the basis of the published recommendations [29]. The majority of participants (90%) felt guilty and self-blamed for patients because of these changes, although several authors have previously shown that the H1N1 pandemic had only minimal impact on cancer management of cancer patients [32,33,34].

In conclusion, this study aims to provide indicators on the influence of Covid 19 pandemic on the behavior and attitudes of healthcare professionals working in oncology field. These indicators can be used as a reference when defining and implementing support measures for healthcare professionals when resuming normal activity in the post-pandemic period.

ACKNOWLEDGMENTS

The authors wish to thank the study participants for their contribution to the research, as well as current and past investigators and staff. The authors would specifically like to thank Professor Elhaimeur Hanae for her professional writing help.

ETHICAL APPROVAL

This study has been validated by the biomedical research's ethic committee of Mohammed V University of Rabat, University of medicine and pharmacy of Rabat and University of dentistry of Rabat. It's registered in the Office for Human Research Protections of the U.S. Department of Health and Human Services under number IORG0006594 (<http://ohrp.cit.nih.gov/search/search.aspx>).

REFERENCES

- Cucinotta D, and Vanelli M. WHO declares COVID-19 a pandemic. *Acta Biomed.* 2020; 91:157-160.
- Health Ministry of Morocco. 2020.
- Chen Q, Liang M, Li Y, Guo J, Fei D, et al. Mental health care for medical staff in China during the COVID-19 outbreak. *Lancet Psychiatry.* 2020; 7(4): 15-16.
- Verma S, Mythily S, Chan Y.H, Deslypere J.P, Teo E.K, et al. PostSARS psychological morbidity and stigma among general practitioners and traditional Chinese medicine practitioners in Singapore. *Ann Acad Med.* 2004; 33:743-748.
- Tang C & Liu C. Work-Related accumulated fatigue among doctors in tertiary hospitals: a cross-sectional survey in six provinces of China. *Int J Environ Res Public Health.* 2019; 16(17): 3049.
- Liang W, Guan W, Chen R, Wei Wang, Jianfu Li, et al. Cancer patients in SARS-Cov-2 infection : a nationwide analysis in China. *Lancet Oncol.* 2020; 21(3): 335-337.
- Kamboj M & Sepkowitz KA. Nosocomial infections in patients with cancer. *Lancet Oncol.* 2009;10(6) : 589-597.
- Sica A & Massarotti M. Myeloid suppressor cells in cancer and autoimmunity. *J Autoimmun.* 2017; 85:117-125.
- Wang H & Zhang L. Risk of COVID-19 for patients with cancer. *Lancet Oncol.* 202; 21(4): 181.
- Wu KK, Chan SK, Ma TM. Posttraumatic stress, anxiety, and depression in survivors of severe acute respiratory syndrome (SARS). *J Trauma Stress.* 2005; 18(1): 39-42.
- Wu KK, Chan SK, Ma TM. Posttraumatic stress after SARS. *Emerg Infect Dis.* 2005; 11(8): 1297-1300.
- Han Xiao, Yan Zhang, Desheng Kong, Shiyue Li, Ningxi Yang. The effects of social support on sleep quality of medical staff treating patients with coronavirus disease 2019 (COVID-19) in January and February 2020 in China. *Med Sci Monit.* 2020; 26: e923549.
- Lange T, Dimitrov S, Born J. Effects of sleep and circadian rhythm on the human immune system. *Ann NY Acad Sci.* 2010; 1193: 48-59.
- Yao KW, Yu S, Cheng SP, Chen IJ. Relationships between personal, depression and social network factors and sleep quality in community-dwelling older adults. *J Nurs Res.* 2008; 16(2): 131-139.
- Peng EY, Lee MB, Tsai ST, Yang CC, Morisky DE, et al. Population-based post-crisis psychological distress: An example from the SARS outbreak in Taiwan. *J Formos Med Assoc.* 2010; 109: 524-532.
- Maunder R, Hunter J, Vincent L, Jocelyn Bennett, Nathalie Peladeau, et al. The immediate psychological and occupational impact of the 2003 SARS outbreak in a teaching hospital. *CMAJ.* 2003; 168(10): 1245-1251.
- Lee AM, Wong JG, McAlonan GM, Vinci Cheung, Charlton Cheung, et al. Stress and psychological distress among SARS survivors 1 year after the outbreak. *Can J Psychiatry.* 2007; 52(4):233-240.
- Alvaro P, Roberts RM, Harris JK. A systematic review assessing bidirectionality between sleep disturbances, anxiety, and depression. *Sleep.* 2013; 36(7): 1059-1068.
- Johnson EO, Roth T, Breslau N. The association of insomnia with anxiety disorders and depression: Exploration of the direction of risk. *J Psych Res.* 2006; 40(8): 700-708.
- Jianbo Lai, Simeng Ma, Ying Wang, Zhongxiang Cai, Jianbo Hu, et al. Factors Associated With Mental Health Outcomes Among Health Care

- Workers Exposed to Coronavirus Disease 2019. JAMA Netw Open. 2020; 3(3):e203976
21. Georgina Morley, Christine Grady, Joan McCarthy, and Connie M. Ulrich. Covid-19: Ethical Challenges for Nurses. Hastings Center Report. 2020; 50: 1-5.
 22. American Nurses Association, Code of Ethics for Nurses with Interpretive Statements (Silver Spring, MD: ANA, 2015).
 23. E. Peter and J. Liaschenko. Moral Distress Re-examined: A Feminist Interpretation of Nurses' Identities, Relationships and Responsibilities. Journal of Bioethical Inquiry. 2013; 10(3): 337-345.
 24. Grellety T, Ravaud A, Canivet A, Ganem G, Guimbaud R. Infection à SARS-CoV-2/ COVID 19 et cancers solides : synthèse des recommandations à l'attention des professionnels de santé. 2020; 107(4) :400-402.
 25. You B, Ravaud A, Canivet A, Ganem G, Giraud P, et al. The official French guidelines to protect patients with cancer against SARS-CoV-2 infection. Lancet Oncol. 2020; 21(5): 619-621.
 26. Thésaurus national de cancérologie digestive. Prise en charge des cancers digestifs en fonction de la situation épidémique COVID-19. 2020.
 27. The American College of Surgeons (ACS). Elective case triage guidelines for surgical care, 2020.
 28. F Cortiula, A Pettke, M Bartoletti, F Puglisi, T Helleday. Managing COVID-19 in the oncology clinic and avoiding the distraction effect. Editorial of Annals of oncology. 2020; 31(5): 553-555.
 29. COVID-19: global consequences for oncology. Editorial of the Lancet oncology. 2020; 21: 467.
 30. El Amrani M, Stéphanie Truant, Anthony Turpin. COVID 19 and cancer : what are the consequences of the reorganization of cancer care?. Bull Cancer. 2020;107(5): 538-540.
 31. French Cancer Society. Recommendations and tools from wise societies and organizations, 2020,
 32. Lu TH, Chou YJ, Liou CS. Impact of SARS on healthcare utilization by disease categories: implications for delivery of healthcare services. Health Policy. 2007; 83(2): 375-381.
 33. Schull MJ, Stukel TA, Vermeulen MJ, Zwarenstein M, Alter DA, et al. Effect of widespread restrictions on the use of hospital services during an outbreak of severe acute respiratory syndrome. CMAJ. 2007; 176(13): 1827-1832.
 34. Nakada H, Tsubokura M, Matsumura T, Kodama Y, Kami M. Impact of the H1N1 Influenza A virus epidemic on cancer treatment in Hyogo, Japan. Int J Infect Control. 2011; 7: 1-4.

Cite this article

Az-zahra Zakkouri F, Bouaiti E, Elghissassi I, Abahssain H, Naciri S, et al. (2021) The influence of coronavirus / COVID-19 pandemic on the behavior and attitudes of health professionals at the National Cancer Institute in Rabat/Morocco. Ann Public Health Res 8(2): 1107.