

Abrupt introduction of distance learning during the covid-19 pandemic: What psychological impact on teachers?

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Abstract. As soon as the COVID-19 pandemic appeared, the Moroccan education ministry decided to adopt distance learning (DL). Our target was to study the psychological impact of DL on Moroccan teachers during the pandemic. This cross-sectional study used an online questionnaire based on the Hospital Anxiety and Depression Scale. Among 148 responses, 64.9% were women, and the average age was 41.1 ± 11.5 years. 79.1% participated in DL, 58.8% were required to acquire DL tools and 71.6% had never received DL training. Between the start and the end of confinement, we noticed a decrease in the motivation of teachers. 36.2% had definite depressive symptomatology and 41.3% had certain anxiety symptomatology with a significant predominance in women. The frequencies of depression and anxiety were higher in those who had participated in DL, but the association was not significant. Depression was significantly frequent among teachers who were obliged to acquire tools to practice DL $P=0.02$, those who had never received training DL $P=0.046$, and those who were not satisfied with the situation $P=0.03$. We didn't find a direct association between DL and anxiety and depression, which the small sample size may explain, but we did find an association with the variables related to DL.

Background

Since December 31st, 2019. A new disease called SARS-CoVID-19, detected in Wuhan City (OMS) is terrifying and upsetting everyone, and is undermining international stability through its speed of transmission and its heavy burden on public healthcare systems and the global economy (1). All over the world, governments were obliged to adopt strict

measures such as quarantine or confinement, compulsory wearing of masks, preventing gatherings, screening passengers returning from affected countries, teleworking, and distance learning for students (2).

In Morocco, since March 16th, 2020, as part of the measures to control the pandemic, the ministry of education has taken decided to adopt distance learning, to facilitate social distancing and prevent the spread of the virus through the school community.

E-learning or distance learning is a way of studying that takes place without the physical presence of students or teachers in the classroom, and it is dissociation in time and space of the teaching and learning process (3,4), which provides the pursuit of the official course program and keeps students safe.

Nevertheless, distance learning was implemented and introduced by the minister of education in Morocco abruptly and unexpectedly, which could lead to a negative mental effect on both teachers and students. Indeed, teachers were suddenly asked to exercise a new style of teaching. They had to transform their courses and programs into digital support and materials. In addition, the majority have modest experience in the use of digital and computer educational tools, and distance learning is a never-before-seen experience for them (5).

All over the world, diverse studies have focused on the mental health of populations during the pandemic (6-9), and many of them have found a psychological impact. But few studies have specifically looked at the mental health of the teaching community (10-12). To our knowledge, this study is the first in Morocco to be interested in understanding the psychological impact of the distance learning experience that has been generalized across all grade levels.

The main objective of this study was to analyze the psychological impact of distance learning and confinement on Moroccan teachers during the period of the CoVID-19 pandemic. We also studied the psychological impact of confinement on this population of professionals and estimated the degree of satisfaction and motivation for this new teaching tool.

Methods

Ethics statement. We have mentioned in the header of the online questionnaires that filling in the online questionnaire

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implies the informed consent of the participants. Study data were collected with due respect for the dignity, privacy and confidentiality of patient information, in accordance with the Declaration of Helsinki, our participants have been informed of the purpose of the study, and the questionnaires distributed will be anonymous

The study protocol was approved by the Ethics Committee for Biomedical Research of Oujda (CERBO) under N°10/2020.

Study process. We carried out this cross-sectional study with a descriptive and analytical purpose, for which we distributed an online questionnaire with two parts via the Google form platform. The first included questions about (socio-economic data, quarantine, and the modalities of distance learning); the second part is based on the HAD scale (13).

The HAD scale was developed by Sigmond and Snaith and is used to determine the levels of anxiety and depression, of which we used the French version (14). It consists of 14 questions, each scored from 0 to 3. We cut out the results of the scores (anxiety and depression) in two ways: for the descriptive part (7 or less no symptoms; 8 to 10: doubtful symptomatology; 11 and more: definite symptomatology) and the analytical part (13 or less no symptoms with doubtful symptomatology; more than 13 definite symptomatology) (15).

We used a scale from zero to ten to assess our teacher's satisfaction and motivation with distance learning.

The data were stored and analyzed at the Laboratory of Epidemiology, Clinical Research and Public Health of the Faculty of Medicine and Pharmacy of Oujda-Morocco, the data entry was done automatically by converting from Google Forms to Excel and statistical analysis was done by using SPSS vs. 21.0 software.

A descriptive analysis was performed. The quantitative variables were described using averages and standard deviations, and the qualitative variables were described using frequency and percentages. Next, a univariate analysis was performed by using a 'Chi2' test or 'Fischer' test to compare categorical variables and a 'student' test to compare quantitative variables. We also proceeded to the multivariate analysis with a stepwise binary logistic regression (descending model). $P=0.05$ will be considered as the significance threshold for testing and distance learning, being the main explanatory factor in our study, is forced into this model.

Results

Descriptive analysis. There were 148 responses, 64.9% of which were women. The average age of our participants was 41.1 ± 11.5 years. Among them, 87.2% were from urban areas and 67.6% were married. More than half of our participants had children, 16.9% of them had more than two children, and 23% lived alone. Among the participants, 5.4% had toxic habits and 4.7% were tobacco users. In addition, 20.3% had a chronic illness, and 20.3% had mental disorders (depression 26.3%; anxiety 21.1%; and sleep disorders 52.6%). More than half of responders (76.4%) strictly respected quarantine, 2.7% had tested positive during the start of confinement, and 19.6% had a family member or acquaintance who tested positive.

The average seniority in the service of our responders was 14.1 ± 10.5 (53.4 had 12 or fewer years of seniority). Most of

them (78.4%) are practiced in urban areas. The levels that our participants taught were (high school 18.2%; middle school 27.0%; university 12.8%; other levels 41.9%). One hundred and seventeen (79.1%) of our respondents participated in distance learning. Several means of communication with students were used, but the most popular was WhatsApp (40.7%), and our teachers mostly used videos and audio to present their lessons. Half of our respondents (58.8%) were forced to acquire the means to teach lessons, and unfortunately, 71.6% never received distance education training. More than half of the participants were not or not very satisfied with the process of distance learning, while 14.2% were satisfied or very satisfied. Thus, we observed that the degree of motivation had decreased between the beginning and the end of the confinement (we noticed that 44.6% were motivated at the beginning against only 23.6% at the end, and 55.4% were not motivated).

Among all respondents, 42.1% had certain anxiety symptoms vs. 57.9% normal or with borderline symptoms. On the other hand, 36.2% were with certain depressive symptoms vs. 63.8% normal or with borderline symptoms.

Bivariate analysis

Depression. We notice that women were more affected by depressive symptoms than men (43.2% vs. 24% with certain depressive symptoms $P=0.024$), also we have noted that responders who participated in distance learning during confinement had more symptoms of depression than others. Still, the association was not significant (39.4% vs. 24.1 $P=0.127$).

Furthermore, participants who did not benefit from distance learning training had more depression symptoms (42.4% vs. 10.0% $P=0.046$), and teachers who had been obliged to acquire the means to practice distance teaching were more affected by depression (45.7% vs. 21.4 $P=0.024$). On top of that, 'not satisfied' and 'less satisfied' teachers were more affected by depression symptoms than satisfied ones (44.3% vs. 19.0% $P=0.033$).

We noted that there is a relationship between motivation in teachers and their psychological status, by the fact that teachers with more depression symptoms were not motivated at the start and the end of confinement (Start '53.2% vs. 29% $P=0.011$ '; End '48.1% vs. 18.8% $P=0.033$ ').

Anxiety. There too we noted that women were more affected by anxious symptoms than men (47.0% vs. 23.5% $P=0.001$), and responders who participated in distance learning during confinement had more symptoms of anxiety than others, but the association was not significant (Anxiety: 44.2% vs. 33.3% $P=0.302$).

And also, we observed that the motivation of teachers affects their psychological situation, and teachers with more anxiety symptoms were not motivated at the start and the end of confinement (Start' 59.2% vs. 32.8% $P=0.005$ '; End '50.0% vs. 31.4% $P=0.066$ '). We also remarked that teachers with more symptoms of anxiety spent more than 3h per day preparing the course (54.9% vs. 35.5% $P=0.039$).

Logistic regression. The stepwise binary logistic regression analysis did not reveal any statistically significant association between participation in distance learning and depression or anxiety.

Table I. Demographic data, medical history, and data related to normal learning and distance learning N=148.

Variable	Frequency	Percentage
Socio-demographic/medical history		
Age (Average/SD): 41.10±11.54.		
Age groups (n/%)		
≤40 years	75	50.7
>40 years	73	49.3
Gender (n/%)		
Men	52	35.1
Women	96	64.9
Residence area of participants (n, %)		
Urban	129	87.2
Rural	19	12.8
Marital status, (n/%)		
Single	40	27.0
Married	100	64.6
Divorced	8	5.4
Participants with children (n/%)		
	95	64.2
Participants who live alone (n/%)		
	34	23.0
Participants without toxic Habits (n/%)		
	100	94.6
Participants with Chronic illness (n/%)		
	30	20.3
Participants with a History of preexistingpsychologic/ psychiatric condition, n (%)		
Depression	10	26.3
Anxiety	8	21.1
Sleep disorders	20	32.6
Teaching:		
Average/SD of seniority: 14.17±10.50.		
Duration of teaching experience:		
≤12 years	79	53.4
>12 years	69	46.6
Exercise area of the participants:		
Urban	116	78.4
Rural	32	21.6
Academic institution:		
University	19	12.8
High school	27	18.2
Middle school	40	27.6
Primary/pre-school	62	41.9
Distance learning		
Teachers participating in distance learning	117	79.1
Teachers who have received training in distance learning	11	9.4
Teachers are obliged to acquire the means:	87	74.4
Time spends to make courses		
≤3H	64	54.7
>3h	53	45.3
Teachers' satisfaction with the progress of distance learning:		
Not satisfied/less satisfied	96	82.1
Satisfied/very satisfied	21	17.9
Teachers are motivated at the start of confinement.		
	66	56.4
Teachers are motivated at the end of confinement		
	35	29.9

Table II. The Associated risk factors with (depression/anxiety) in our sample N=148.

	Depression impact			Anxiety impact		
	Frequency	Percentage	P-value	Frequency	Percentage	P-value
Gender: (n/%)			0.024 ^a			0.001^b
Woman	38	43.2		47	52.8	
Men	12	24.0		12	23.5	
Age groups (n/%)			0.651			0.648
≤40 years	23	34.3		30	44.1	
>40 years	27	38.0		29	40.3	
Marital status, (n/%)			0.240			0.510
Single	38	40.4		43	45.3	
Married	11	29.7		14	36.8	
Divorced	1	14.3		2	28.6	
Participants with children (n/%)	34	37.8	0.605	39	43.8	0.595
Participants: (n/%)			0.417			0.048^a
Living alone.	10	30.3		9	27.3	
Living with someone.	40	38.1		50	46.7	
Participants with toxic Habits: (n/%)	4	50.0	0.316	4	57.1	0.329
Duration of teaching experience: (n/%)			0.385			0.444
≤12 years	24	32.9		33	45.2	
>12 years	26	40.0		62	38.8	
Teachers participating in distance learning: (n/%)	43	39.4	0.127	50	44.2	0.302
Teachers are obliged to acquire the means: (n/%)	37	45.7	0.024^a	38	45.8	0.585
Teachers who have not received training in distance learning: (n/%)	42	42.4	0.042^a	48	6.6	0.098
Time spends to make courses: (n/%)			0.093			0.039^a
≤3H	19	32.2		22	35.5	
>3h	24	48.0		28	54.9	
Teachers' satisfaction with the progress of distance learning: (n/%)			0.033^a			0.529
Not satisfied/less satisfied	39	44.3		52	45.7	
Satisfied/very satisfied	4	19.0		8	38.1	
Teacher motivation at the start of confinement. (n/%)			0.011^a			0.005^b
Motivated	18	29.0		21	32.8	
Not motivated	25	53.2		29	59.2	

Discussion

This cross-sectional study assessed the psychological impact of distance learning on Moroccan teachers during the COVID-19 quarantine. To the best of our knowledge, our study is the first to look at the psychological effect of this type of education on the community of educators during the COVID-19 pandemic in Morocco. Several studies have focused on the problem of mental health during the pandemic on the general population, and have found a psychological impact of the pandemic (6-10,12), but also on sub-populations (vulnerable groups, school children, students, and healthcare workers (9). Other surveys were interested in the impact of distance learning on teachers, and many of them sought and

found an alteration in teachers' mental health during the pandemic (10-12). However, the assessment of this impact changes considerably from one study to another due to the use of different scales and the way of interpretation, and also to the differences in the reading of the questionnaire by the respondents, which can lead to classification errors.

According to our results, we observed a high proportion of anxiety and depression symptoms in our sample (42.1 and 36.2%, respectively). In a study conducted in Greece at the beginning of the pandemic, it was found that 34% experienced a high degree of anxiety while only 8% suffered from severe depression. On the other hand, distance learning was not a major concern (16). Another study also conducted in Jordan in this sense found that 31.4% of respondents had

Table III. Results of binary logistic regression of the association between depression/anxiety and explanatory variables, adjusted on the factors studied in our sample.

	Anxiety impact			Depression impact		
	OR	IC95%	P-value	OR	IC95%	P-value
Gender:			<0.001^c			0.020^a
Men	1	[1.977;10.588]		2.620	[1.163;5.904]	
Women	4.576					
Toxic habits:				4.568		0.075
Yes	6.364	[1.148;35.273]	0.034^a		[0.860;24.256]	
No	1					
Participation in distance learning:			0.953			0.173
Yes	1.028	[0.408;2.594]		1.981	[0.741;5.293]	
No	1					

severe distress while 38.2% had mild to moderate distress, which is consistent with studies done on the general population during the pandemic where a wide variety of psychiatric problems have been found (6,9,17).

A study conducted among the Pakistani population mentioned feelings of fear, depression, and anxiety, which could be related to factors of the unpredictability of the new pandemic, social isolation, and fear of illness, death, and unemployment (18).

After performing univariate and multivariate analysis, we did not find a strong association between distance learning and the symptoms of depression and anxiety observed in our sample, which may be explained by the small size of our sample and the online data recruitment.

While the results of univariate and multivariate analyses concluded a highly significant relationship between gender and psychological impact, notably that women are the most affected by symptoms of depression and especially anxiety, which is in line with the literature where this relationship is almost always found to be significant, especially in pregnant women or victims of violence, who present a higher risk of developing psychological problems than the rest of the population (19). Also, in the context of the pandemic and distance learning (6,7,11,16,17,20,21).

We couldn't highlight a relationship between age and the psychological impact of e-learning in our study, even if it was found in another study conducted in the demographic republic of Congo that evaluated the psychological impact of the COVID-19 pandemic in the population of Kinshasa; The prevalence of anxiety and depression during the COVID-19 pandemic was more or less high, with a predominance of older subjects (6).

In the current study, the participants who did not benefit from distance learning training and who had the obligation to acquire new means and pedagogical tools had more depressive symptoms than others, which is explained by having the experience of working from home. This was mentioned in a longitudinal study conducted in Austria on workers who studied the effect of personal resources (expertise in remote work), and external resources (equipment) (22). Another study conducted at Kennesaw University concluded the relationships between stress and burnout and remote teaching, especially for those who had

limited experience working at home (23). We also observe that teachers with more symptoms of anxiety spend more than 3 h per day preparing courses for distance learning, which can be explained by burnout. and by the teachers' other responsibilities at home (parents who participate in distance learning).

We observed a decrease in the degree of motivation between the start and the end of confinement, and this motivation affects their psychological situation. Indeed, teachers with more anxiety and depression symptoms were not motivated at the 'start' and 'end' of confinement, which is consistent with the results of the study in Jordan, which revealed a statistically significant association between low motivation for distance education and the severity of distress (12). In a qualitative study on the factors influencing the acceptance of the use of digital tools by teachers during COVID, it was found that the motivation of the teachers influenced the acceptance of the technological tools (24). Another study conducted in Romania using a research model that included self-efficacy (SE), technological pedagogical knowledge (IM), extrinsic work motivation (EM), and occupational stress (OS) concluded that intrinsic motivation influences, with high positive intensity, the intention to continue teaching online and, with high negative intensity, burnout and technostress (25).

Limitations. Our study had some limitations. The main limitation is related to the fact that we used a non-random snowball sampling using an online questionnaire, due to the social distinction measures during the pandemic. In addition to that, the teachers included are not necessarily representative of all teachers, which could lead to a selection bias, but the advantage of this method is the limitation of information bias that could be found during a face-to-face interview. Another limitation is the limited number of respondents due to the use of an online questionnaire.

Conclusion

The results of this study showed an indirect psychological impact of distance learning among teachers. It is therefore important to work on the psychology of teachers and their

ability to adapt and respond to changing work situations and new learning tools. Our study's results could help to guide the efforts of the Moroccan Ministry of Education and policymakers to address the psychological health problems of teachers and workers in general. We also emphasize, in addition to the logistic and material support, the need for psychological, moral, and social assistance in similar situations for teachers, workers, and the general population.

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Author contributions

Hanane Aissaoui and Mariam Atassi and Naima Abda designed the research, Hanane Aissaoui and Asmae Lekfif and Asmae Yeznasni and Sanae Sabbar performed the experiment and collected data. Hanane Aissaoui and Mohammed Amine Bouazzaoui analysed the data, Hanane Aissaoui wrote the manuscript. Naima Abda and Mariam Atassi supervised and revised the manuscript.

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Data availability statement

The data used to conduct this study are available from the principal author upon reasonable request.

Declaration of competing interest

We have no conflict of interest regarding this project.

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