THE MENTAL HEALTH OF THE FRENCH FACING THE COVID-19 CRISIS: PREVALENCE, EVOLUTION AND DETERMINANTS OF ANXIETY DISORDERS DURING THE FIRST TWO WEEKS OF LOCKDOWN (COVIPREV STUDY, MARCH 23-25 AND MARCH 30 – APRIL 1ST, 2020)

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Abstract

Introduction – *The growing number of cases and deaths due to COVID-19 has prompted the lockdown of the French population as from 17 March 2020. This epidemic crisis, as well as the living conditions under lockdown are likely to impact the mental health of the population. Santé publique France has thus set up a behavioural and psychological surveillance with one of the objectives being to assess the state of the mental health of the population, identify its determinants, and monitor its evolution.*

Methods – *Samples from the general population are issued from an access panel of the BVA polling institute.*

For each wave, an independent sample of 2,000 people aged 18 and over residing in metropolitan France are interviewed via the Internet. The data presented here are from the first two waves that took place from 23 to 25 March and 30 March to 1 April 2020

Results – *During the first wave, the prevalence of anxiety was 26.7%, i.e. twice the rate observed in a previous survey in the general population (13.5% in 2017). During the second wave, the prevalence of anxiety had significantly decreased to 21.5%.*

Higher risks of anxiety were associated with 1/ Socio-demographic characteristics: being a woman, being a parent of children aged 16 years or younger, reporting a difficult financial situation; 2/ Living conditions related to the epidemic situation: working from home and having a friend or relative who has been ill or has had symptoms of COVID-19; 3/ Knowledge, attitudes and practices about COVID-19: perceiving COVID-19 as a serious disease and feeling vulnerable to it. Conversely, having a good understanding of the disease transmission route, respecting the lockdown measures, feeling able to adopt protective measures and having confidence in the government action reduced the risk of having anxiety.

Moreover, the decrease in anxiety between the two waves has not been observed in people who reported a difficult financial situation, in the least advantaged socio-professional categories, or in people living in promiscuity, thus reflecting the widening gap of health inequalities during the lockdown.

Conclusions – *These initial results helped strengthen and adjust the response for mental health promotion and prevent the development of psychological disorders. They also highlight the need to protect and support the most vulnerable households. Finally, they suggest a protective effect of lockdown on anxiety and question a possible upward trend of anxiety level after lockdown.*

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Keywords: *COVID-19, Anxiety disorders, Lockdown, General population survey*

Introduction

In January 2020, the World Health Organization (WHO) declared the COVID-19 outbreak caused by the novel coronavirus SARS-CoV2 an international public health emergency with a high risk of spread in many countries around the world, and eventually reclassified it as a pandemic on 11 March 2020.

This exceptional situation, relayed permanently and massively by the media and social networks caused anxiety and stress in the population[1]. As early as February 2020, articles published in The Lancet alerted politicians and the scientific community on the impact of the management of news coverage pertaining to the COVID-19 epidemic on the mental health of populations[2] and on the need for mental health prevention and care[3]. A large national study conducted in China at the beginning of February showed that 35% of the 52,730 respondents were in psychological distress[4].

In France, since the first cases of COVID-19 at the end of January, the number of cases and deaths continued to increase. The lockdown of the whole population

was set up on 17 March 2020. A recent review of the literature has shown that quarantine during previous epidemics had a strong impact on mental health, including anxiety disorders, post-traumatic stress symptoms, depressive disorders, psychological distress and sleep disorders, some of these with long lasting effects[5]. Thus, the epidemic situation (fear of contamination for self and loved ones), the living conditions during lockdown (loss of freedom, social isolation or promiscuity, loss of salary) and the anticipation of the economic and social consequences are likely to contribute to the onset or exacerbation of anxiety and depressive disorders in the population.

Efforts to control and reduce SARS-CoV2 transmission rely on prevention measures requiring behavioral changes and their maintenance over time (physical distancing, hand washing, facemask use, reorganization of daily and social life, etc.). People's mental health plays an important role in the way they respond, adhere and adapt to these protective measures[6].

Santé publique France has therefore set up behavioral and psychological monitoring based on an internet survey system among samples of the general population. One of the objectives is to assess the state of mental health of the population, identify its determinants and monitor the trends. This paper presents the main results of the first two waves of the investigation conducted after the first and second weeks of the lockdown. The analysis of the data collected is useful for guiding and adjusting prevention measures and messages.

Material and methods

Data sources

During each wave, an independent non-probabilistic sample of 2,000 people aged 18 and over residing in mainland France were interviewed. Respondents were recruited from a web access panel (BVA polling institute). The construction of the samples was based on a quota method applied to gender, age, region, socio-professional category and agglomeration size variables. The results presented here are from wave 1 (W1, 23 to 25 March 2020) and wave 2 (W2, 30 March to 1 April 2020). They are weighted on gender, age, socio-professional category and agglomeration size based on the 2016 general census of the population of the National Institute of Statistics and Economic Studies (INSEE).

Variables

The respondents' level of anxiety was measured by the Hospital Anxiety and Depression scale (HADS) developed by Zigmond and Snaith which includes 14 items, seven related to anxiety and seven others to depression[7]. It has been translated and validated in French by Lépine et al.[8]. Its psychometric properties are considered good enough for the assessment of anxiety in the general population and in clinical settings[9,10]. A score ranging from 0 to 3 is assigned to each item and added to establish a global score. In this study, only the subscale measuring anxiety was used and a probable case of anxiety was defined by a score above 10[7].

The explanatory variables were divided into three separate blocks:

1. Sociodemographic variables (block 1): gender; age grouped in six classes (18-24 years old, 25-34 years, 35-49 years, 50-64 years, 65 years and older) ; socio-professional category (SPC) in three classes with the retired and unemployed classified according to their former profession (higher socio-professional categories SPC+, lower socio-professional categories SPC-, unemployed) ; diploma in two classes (lower than Bac [secondary school level], Bac or higher); perception of one's financial situation in three classes (good, tight, difficult); being parent of child(ren) aged 16 years or younger; geographic area of residence in mainland France (five zones: North-West, North-East, South-West, South-East, Île-de-France);

2. Variables related to the lockdown and the epidemic situation (block 2): working conditions in five classes (inactive and unemployed, working at home, working outside the home, part-time unemployment, sick leave); promiscuity within the accommodation (defined as an area less than 18 m² per person or less than 25 m² for a person living alone); having an accessible outdoor space in the accommodation; having at least one moral or emotional support; living alone during the lockdown; having a friend or relative who has been ill or has had symptoms of COVID-19; having symptoms of COVID-19 in three classes (none or symptoms other than cough or fever, cough and/or fever, breathing difficulties);

3. Behavioral and cognitive variables (i.e. perception of the COVID-19 epidemic and protective measures; block 3): knowledge on the COVID-19 transmission (good, bad); compliance with the lockdown measures (score ranging from 0: not at all compliant to 3: completely compliant); approval of protective measures by relatives (score ranging from 0: not at all to 3: completely); one's ability to adopt protective measures (scale ranging from 0: not at all able to 10: quite able); confidence in the action of public authorities (scale ranging from 0: not at all confident to 10: completely confident); perception of the severity of the COVID-19 epidemic (scale ranging from 0: not at all serious to 10: really very serious); perception of one's vulnerability to COVID-19 (scale ranging from 0: not at all vulnerable to 10: very vulnerable).

Statistical analyses

Percentages from bivariate analyses, as well as changes between waves 1 and 2 were compared using the Pearson's Chi2 independence test, with a significance threshold set at 5%. Prevalence estimates were weighted by gender, age, socio-professional category,

urban category and area of residence and presented with their 95% confidence intervals (95% CI).

In order to control for possible structural effects related to population characteristics and to quantify the strength of the association between anxiety and the explanatory variables, logistic regressions were performed separately for each of the three above-mentioned blocks (socio-demographic, lockdown and epidemic situation, perception of the COVID-19 epidemic and protective measures). In each of the block analyses, gender, age and CSP were integrated as adjustment variables. The variables that showed a significant association with anxiety in each of the block logistic regressions were retained in the final regression model; this association was assessed by the adjusted odds ratio (ORa) and measured by the adjusted Wald test with a significance threshold set at 5%. Confidence intervals at 95% (95% CI) were calculated. Hosmer-Lemeshow tests were performed after each logistic regression and showed a good fit of the models. Finally, a sensitivity analysis (not presented here) was carried out to take into account individuals (N = 479) who did not answer to all the questions and did not appear in the final logistic regression model. Its results showed no difference with the analysis presented.

The analyses were carried out with Stata® software (version 13.1 SE).

Results

Prevalence of anxiety

Table 1 shows the prevalence of anxiety (HADS score> 10) according to the characteristics of the respondents, one week (wave 1) and two weeks (wave 2) after the start of the lockdown. The anxiety prevalence in the general population surveyed in wave 1 was 26.7% (95% CI: [24.8-28.7]). In wave 2, we observed a significantly lower prevalence than in wave 1 with a rate of 21.5% [19.8-23.4].

The prevalence of anxiety differed according to socio-demographic characteristics and living conditions due to the epidemic situation.

In wave 2, significant differences were observed according to: (1) exposure to the disease (higher rate among people who reported having had symptoms related to COVID-19, especially respiratory difficulties, 34.4%); (2) financial situation (higher rate among people reporting a difficult situation, 34.2%); (3) working conditions (higher rate among those on sick leave, 32.4%); (4) promiscuity in the home (higher rate among people confined in overcrowded housing, 31.1%); (5) exposure of relatives to the disease (higher rate among respondents reporting having relatives who were ill or who presented COVID-19 symptoms, 28.3%); (6) socio-professional category (higher rate in the lower socio-professional category SPC-, 26.9%); (7) level of qualification (higher rate among people with a diploma below Bac, 26.7%); (8) being parent of child(ren) aged 16 or younger, 26.5%; (9) sex (higher

rate in women, 26.0%); (10) age (higher rate among those under 50, especially among the 25-34 year-olds, 25.9% and the 35-49 year-olds, 25.0%).

All of these segments of the population already had significantly higher prevalence of anxiety in wave 1 except those with a diploma below Bac (27.9% vs. 26.2% for Bac or higher). The difference in the anxiety prevalence according to the diploma level in wave 2 is due to a differential evolution of anxiety between the two waves, no significant evolution was observed for people with a diploma below Bac while the prevalence decreased significantly for those with Bac or higher.

Moreover, certain variables on the lockdown conditions, such as having an accessible outdoor space, living alone during the lockdown or having emotional and moral support were not associated with anxiety in neither of the two waves.

Trends in prevalence between the two waves

There was a global decrease in anxiety prevalence between wave 1 and wave 2 (table 1). However the changes according to the respondents' characteristics showed no significant evolution for certain groups. In particular, no significant evolution of anxiety prevalence was observed among people reporting a difficult financial situation (32.8% in W1 and 34.2% in W2); those living in promiscuity (34.8% in W1 and 31.1% in W2); people SCP- (29.6% in W1 and 26.9% in W2) or those with a diploma below Bac (27.9% in W1 and 26.7% in W2). For other groups showing no significant decrease, prevalence observed in W1 should be considered (rates below average; e.g. people aged 50 and over), as well as sample size (could be insufficient to detect significant statistical change; e.g. people who declared breathing difficulties).

Associated factors

Table 2 shows the logistic regression models adjusted for factors associated with anxiety for all the respondents surveyed in W1 and W2 (N = 4,003), first for each of the blocks of explanatory variables (block models) and then for the variables that were significant in each of the blocks (final model). Independently of the other factors, the risk of anxiety was time related, with a risk lower in wave 2 compared to wave 1.

Considering W1 and W2 together, the risk of anxiety was also associated with certain socio-demographic characteristics (block 1). Independently of the other variables included in the block model, gender, age, socio-professional category, level of diploma, perception of one's financial situation and being parent of child(en) aged 16 or less were associated with anxiety (cf. block model in table 2). After adjustment on the significant variables from the other blocks (living conditions due to the epidemic, and perception variables related to COVID-19 and protective measures, cf. final model in table 2), being a woman, being parent of child(ren) aged 16 or younger, reporting a "tight" or "difficult" financial situation remained significantly associated with higher risks of anxiety. Conversely, the 35 year-olds and older showed lower risk of anxiety.

Prevalence of anxiety during the first two waves of the CoviPrev Survey, Metropolitan France, March 23-25 and March 30 - April 1st 2020

	Wave 1 (V1) N=2,000			Wave 2 (V2) N=2,003			V1 vs V2
	N	%	IC95%		N	%	IC95%	

	N	%	IC95%		N	%	IC95%		V1 vs V2
All	2,000	26.7	24.8	28.7	2,003	21.5	19.8	23.4	***
Sex		***				***			
Male	960	21.3	18.9	24.1	954	16.6	14.4	19.1	**
Female	1,040	31.6	28.9	34.5	1,049	26.0	23.4	28.7	**
Age group		***				**			
18-24 years old	196	33.1	26.8	40.1	173	22.5	16.8	29.5	*
25-34 years old	306	37.5	32.2	43.1	294	25.9	21.2	31.3	**
35-49 years old	508	32.0	28.1	26.2	533	25.0	21.5	28.9	*
50-64 years old	512	21.4	18.0	25.2	523	18.4	15.3	21.9	
≥ 65 years old	478	17.0	13.9	20.7	480	17.7	14.6	21.4	
Socio-professional categories		***				***			
SPC+	962	23.1	20.5	25.9	974	17.4	15.1	20.0	**
SPC-	805	29.6	26.5	32.8	794	26.9	23.9	30.1	
Inactive	233	32.3	26.6	38.6	235	20.8	16.0	26.5	**
Level of education						***			
Below secondary school	608	27.9	24.4	31.6	600	26.7	23.3	30.4	
Secondary school or higher	1,392	26.2	24.0	28.6	1,403	19.3	17.3	21.5	***
Perceived financial situation		***				***			
Good	1,082	22.7	20.3	25.3	1,053	14.9	12.9	17.2	***
Tight	529	30.4	26.6	34.5	562	24.9	21.4	28.7	*
Difficult	389	32.8	28.3	37.7	388	34.2	29.6	39.0	
Parent of child(ren) aged 16 or less		***				***			
No	1,435	22.5	20.4	24.7	1,417	19.4	17.5	21.6	*
Yes	562	37.4	33.5	41.5	586	26.5	23.1	30.3	***
Place of residence		*							
North-West	389	25.2	21.1	29.8	407	20.4	16.7	24.6	
South-West	381	22.8	18.8	27.3	372	21.9	18.0	26.4	
South-East	405	25.0	21.0	29.5	415	22.4	18.6	26.7	
North-East	451	30.2	26.2	34.7	453	23.1	19.4	27.3	*
Île-de-France	374	30.1	25.6	35.0	356	19.4	15.5	23.9	**
Working situation		***				***			
Inactive and unemployed	903	22.5	19.9	25.4	896	20.0	17.5	22.8	
Working from home	336	34.7	29.7	39.9	315	17.6	13.7	22.3	***
Working outside the home	257	37.6	22.5	33.4	363	24.6	20.5	29.4	
Part-time unemployment	303	24.3	19.8	29.5	251	19.7	15.2	25.2	
Sick leave	201	34.9	28.6	41.8	178	32.4	25.9	39.7	
Overcrowded accommodation		*				**			
No	1,848	26.1	24.1	28.1	1,863	20.7	18.9	22.7	***
Yes	152	34.8	27.6	42.8	140	31.1	23.9	39.4	
Accessible outdoor space									
No	244	28.3	22.9	34.3	265	24.5	19.6	30.1	
Yes	1,756	26.5	24.5	28.6	1,738	21.0	19.2	23.0	***
Benefits from social or moral support									
No	728	27.9	24.7	31.3	831	19.9	17.3	22.7	***
Yes	1,272	26.1	23.7	28.6	1,172	22.6	20.3	25.2	
Living alone during lockdown									
No	1,557	27.5	25.4	29.8	1,540	22.3	20.2	24.4	***
Yes	443	23.8	20.1	28.1	463	19.0	15.6	22.8	
Having a relative with COVID19 or symptoms of COVID19		***				***			
No	1,627	24.8	22.8	27.0	1,550	19.5	17.6	21.6	***
Yes	373	34.9	30.2	39.9	453	28.3	24.3	32.7	*
Having had COVID19 symptoms		***				***			
No or other symptoms	1,724	25.0	23.0	27.1	1,719	20.0	18.2	22.0	***
Cough or fever	194	33.9	27.5	40.9	192	28.9	22.8	35.8	
Respiratory difficulties	82	45.1	34.6	56.1	92	34.4	25.4	44.8	

Note: Numbers are raw data and percentages are weighted. Significance obtained by the independence test (Pearson's Chi2 test) between each of the explanatory variables and the "anxiety" variable within each of the waves, and for the comparison between wave 1 and wave 2: ***: p<0.001; **: p <0.01; *: p <0.05. 95% CI: 95% confidence interval. SPC: socio-professional category.

Table 2

Factors associated with anxiety in the first two waves of the CoviPrev Survey, Metropolitan France, March 23-25 and March 30 - April 1st, 2020

Explanatory variables	N	Unadjusted % or unadjusted means (V1+V2)	Block model (N=4,003)		Final model (N=3,524)	
			aOR	CI95%	aOR	CI95%
Wave		***	***		***	
Wave 1, March 23 to 25 (ref.)	2,000	26.7	- 1 -		- 1 -	
Wave 2, March 30 to April 1st	2,003	21.5	0.7***	[0.6-0.8]	0.7***	[0.6-0.8]
Block 1: sociodemographic variables						
Sex		***	***		***	
Male (ref.)	1,914	19.0	- 1 -		- 1 -	
Female	2,089	28.8	1.7***	[1.5-2.0]	1.8***	[1.5-2.2]
Age		***	***		***	
18-24 years old (ref)	369	27.8	- 1 -		- 1 -	
25-34 years old	600	31.7	1	[0.7-1.3]	0.7	[0.5-1.1]
35-49 years old	1,041	28.5	0.8	[0.6-1.1]	0.5***	[0.4-0.8]
50-64 years old	1,035	19.9	0.6***	[0.4-0.8]	0.4***	[0.2-0.5]
≥ 65 years old	958	17.4	0.6***	[0.4-0.8]	0.3***	[0.2-0.6]
Socio-professional categories		***	*		ns	
SPC+ (ref.)	1,936	20.2	- 1 -		- 1 -	
SPC-	1,599	28.2	1.1	[1.0-1.4]	1.1	[0.9-1.4]
Inactive	468	26.5	0.8	[0.6-1.1]	0.9	[0.6-1.4]
Level of education		**	*		ns	
Below secondary school (ref)	1,208	27.3	- 1 -		- 1 -	
Secondary school or higher	2,795	22.8	0.8*	[0.7-1.0]	0.9	[0.7-1.1]
Perceived financial situation		***	***		**	
Good (ref.)	2,135	18.9	- 1 -		- 1 -	
Tight	1,091	27.5	1.5***	[1.3-1.8]	1.3*	[1.0-1.6]
Difficult	777	33.5	1.9***	[1.6-2.3]	1.4**	[1.1-1.8]
Parent of child(ren) aged 16 or less		***	***		***	
No (ref.)	2,852	21.0	- 1 -		- 1 -	
Yes	1,151	31.9	1.5***	[1.2-1.7]	1.5***	[1.2-1.8]
Block 2: Variables related to the pandemic and the lockdown						
Working conditions		***	*		*	
Inactive or unemployed (ref.)	1,799	21.3	- 1 -		- 1 -	
Working from home	651	26.5	1.2	[0.8-1.6]	1.5*	[1.0-2.1]
Working outside the home	620	25.9	1.1	[0.8-1.4]	1.2	[0.8-1.7]
Part-time unemployment	554	22.2	0.8	[0.6-1.1]	0.9	[0.6-1.3]
Sick leave	379	33.7	1.3	[0.9-1.8]	1.1	[0.7-1.6]
Having a relative with COVID19 or COVID like symptoms		***	***		***	
No (ref.)	3,177	22.2	- 1 -		- 1 -	
Yes	826	31.3	1.4***	[1.2-1.7]	1.5***	[1.2-1.8]
Having had COVID19 symptoms		***	***		ns	
No symptom or other symptoms	3,443	22.5	- 1 -		- 1 -	
Cough or fever	386	31.4	1.4**	[1.1-1.8]	1.2	[0.9-1.5]
Respiratory difficulties	174	39.5	2.0***	[1.4-2.7]	1.4	[1.0-2.0]
Block 3: Variables related to perceptions about COVID-19 and to protective measures						
Knowledge on the transmission routes of SRAS-CoV2		ns	**		*	
Bad (ref.)	1,295	25.9	- 1 -		- 1 -	
Good	2,708	23.3	0.8**	[0.7-0.9]	0.8*	[0.7-1.0]
Compliance with lockdown measures (scale 0 to 3)			**		**	
per unit	4,003	2.8	0.74**	[0.59-0.93]	0.75**	[0.60-0.93]
Ability to adopt the measures (scale 0 to 10)			***		***	
per unit	3,931	8.4	0.82***	[0.77-0.87]	0.82***	[0.77-0.88]

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Table 2 (continued)

Explanatory variables	N	Unadjusted % or unadjusted means (V1+V2)	Block model (N=4,003)		Final model (N=3,524)	
			aOR	CI95%	aOR	CI95%
Confidence in authorities (scale 0 to 10)			***		***	
per unit	3,787	*5.0*	0.92***	[0.89-0.96]	0.94***	[0.90-0.97]
Perceived severity of the COVID-19 epidemic (scale 0 to 10)			***		***	
per unit	3,929	*8.7*	1.36***	[1.26-1.46]	1.36***	[1.26-1.46]
Perceived vulnerability to COVID-19 (scale 0 to 10)			***		***	
per unit	3,711	*6.7*	1.20***	[1.16-1.24]	1.19***	[1.15-1.23]

Note: Significance obtained by the independence test (Pearson's Chi2 test) between each of the explanatory variables and the "anxiety" variable for the column "% not adjusted (wave 1 and wave 2)" and by the Wald test for ORa columns (adjusted odds ratios). In the analyses of blocks 2 and 3, gender, age and SPC adjustment variables were integrated. ***: p <0.001; **: p <0.01; *: p <0.05; ns: not significant. 95% CI: 95% confidence interval.

Considering the living conditions due to the epidemic (block 2), independently of the other variables in the block, working conditions (work from home, sick leave…), having a relative who was ill or who presented COVID-19 symptoms, or having symptoms oneself were associated with anxiety. In the final model, only working from home and having a relative who was ill or who had COVID-19 symptoms remained significantly associated with higher risks of anxiety.

Finally, independently of socio-demographic characteristics, of living conditions due to the pandemic, of the wave and of other behavioral factors, having a good knowledge of the transmission modes of COVID-19, reporting compliance with the lockdown measures, feeling able to adopt the protective measures and having confidence in the government action to control the pandemic reduced the risk of anxiety. Conversely, perceiving COVID-19 as a serious disease and feeling vulnerable to this disease increased the risk of anxiety.

Geographical area of residence, overcrowding in the accommodation, living alone during the lockdown, having access to an outdoor space, having a moral or emotional support, and approval by the relatives of the protective measures have been tested in the block models, but did not show any significant association with anxiety and are not presented in table 2.

Discussion

This study presents the prevalence of anxiety in the French population during the SARS-CoV2 pandemic. The first wave was conducted one week after the lockdown. During this first wave, the prevalence of anxiety was 26.7%, i.e. twice the rate observed in the general population before the epidemic crisis (13.5%, source: Santé publique France's Barometer 2017, to be published). In wave 2, conducted one week after wave 1, the prevalence of anxiety had significantly decreased (-5 points) with an observed rate of 21.5%. The decrease in psychological disorders over time has also been observed in the general population study in China[4].

Studies in the context of other epidemic situations[11] generally observe a downward trend in risk perception which has been shown to be associated with anxiety in our study. This downward trend is usually attributed to a process of adaptation and risk habituation[12].

Despite a significant inter-wave improvement, mental health remained poor in wave 2 compared to available data before the epidemic. Inequalities are observed with high prevalence rates in certain subgroups. These included people exposed to the disease (having had symptoms associated with COVID-19) and the socio-economically disadvantaged (lower socio professional categories, low levels of diploma and people declaring financial difficulties). Women were also more at risk of anxiety during this epidemic period. This is in line with results in non-epidemic situations where women have consistently higher anxiety prevalences[13]. In addition, a decrease in the level of anxiety in women, comparable to that observed in men, was recorded between the two waves.

We observed a lower prevalence of anxiety among people aged 50 years and older. This result is also consistent with what has been observed in the general population before the COVID-19 epidemic (source: Santé publique France's Barometer 2017). However, with regard to the risk factors of morbidity and mortality associated with COVID-19, we would have expected a higher prevalence of anxiety in older people. In the Chinese study, individuals between the ages of 18 and 30 were also those among whom the psychological distress was the most important. According to the authors, the anxiety of young adults could be explained by their tendency to actively seek information from social networks that can trigger stress[4]. Sampling bias can also be hypothesized. People over 50 recruited via Internet panels could present a better state of health than the population of the same age groups[14] and therefore perceive themselves as being less at risk. Certain living conditions during the lockdown were also associated with

anxiety, with higher rates observed among people confined in overcrowded housing, among those with children aged 16 or less, or working from home.

The decrease in anxiety prevalence between the first and the second week of lockdown was not observed for certain population groups with high levels of anxiety in wave 1, thus reflecting a socio-economic dimension of the epidemic. This was true for people reporting a difficult financial situation, for those in the lowest socio-professional categories or living in overcrowded accommodation. For these people, the constraints due to their living conditions during the lockdown made it more difficult to adjust to the situation.

If we take into account all the factors associated with anxiety, it appears that gender, age, parental status (having children aged 16 or less), perceived financial situation, working from home, and having relatives exposed to the virus were determinants of anxiety. Behaviour, knowledge and perception of COVID-19 and the protective measures were also significant determinants of anxiety. A good level of knowledge of the transmission modes of the virus, feeling able to implement the recommended protective measures or having confidence in the public authorities to control the epidemic were associated with lower anxiety prevalence. Conversely, perceiving the disease as serious, and feeling personal vulnerability to COVID-19 were associated with a higher prevalence of anxiety. Our results also suggest a lower level of anxiety among those reporting high compliance with lockdown measures. Data from studies during previous epidemics show the opposite, i.e. a positive relationship between anxiety and the adoption of protective measures [15]. High levels of adoption of protective measures by the most anxious can be seen as a strategy for dealing with the threat perceived as very important. However, this apparent paradox between our results and the literature must be analyzed with regard to the characteristics of the protective measures considered. The drastic lockdown (closure of all non-essential public places and mandatory home confinement except for essential workers) made it possible to reduce more or less completely the risk of exposure to COVID-19. The level of compliance with the measures can explain the lower anxiety rate among those who report higher compliance with lockdown measures. This hypothesis can also explain the observed decrease in anxiety between the two waves of investigation, and seems to better fit our data than the more traditional hypothesis of risk habituation [11,12], whose mechanisms are partially rendered inoperative by the lockdown itself (risk avoidance). This hypothesis of a protective effect of the lockdown can also explain the relatively low level of anxiety observed in older people as well as the significant decrease in anxiety observed between wave 1 and wave 2 in the geographical areas most affected by the epidemic (Île-de France and Grand-Est).

Last, our data illustrate the important association between mental health and socioeconomic conditions and the need to protect and support financially the most precarious households. As such, a recent study from the University of Cambridge, carried out with Santé publique France for the French component (unpublished data) [1], showed that the French reported fewer financial difficulties and mental health issues than people in other countries (except Germany). Social and economic solidarity systems play an important role in mitigating the impact of the epidemic crisis on the mental health of the population both during and after the lockdown.

These first results from the survey system, especially the high prevalence of anxiety in wave 1, helped to consolidate and adjust the response to promote mental health and prevent the onset or worsening of psychological disorders.

A 24/7 national toll-free number (0800 130 000) has been made available to the general public by the Ministry of Health giving free advice and information on the COVID-19. In order to meet the needs of callers who express important psychological suffering, associative organizations as well as mental health professionals can be reached through this helpline. In addition, a page on mental health was implemented on the website of Santé publique France [2]. The webpage contains key messages on mental health promotion and refers to available resources adapted to different identified issues (psychological support lines, resources for parents, for the bereaved…). These resources should be maintained at the end of the lockdown. It seems that the lockdown, initially considered as a risk factor for mental health, has rather acted for a majority of the population as a protective factor against anxiety. By effectively reducing the risk of exposure to the virus, the lockdown may have contributed to decrease the level of anxiety.

Although the socioeconomic risks have been contained by the measures implemented (part-time unemployment, workers' wages paid up to 84% by the state), certain segments of the population living under most stressful conditions (promiscuity, difficult financial situation) did not have any improvement in their level of anxiety. Consequently, the lifting of the lockdown, initiated to respond to the necessary resumption of an economic activity, must make us aware about the future evolution of anxiety in the general population. Our results show that the level of knowledge and the perceived ability to implement the recommended protection measures are important determinants of anxiety among the population. It is therefore necessary to disseminate effective recommendations and procedures that are easy to implement for the end of the lockdown. Otherwise,

[1] The Winton Centre for Risk & Evidence Communication at the University of Cambridge. Perception of the risk of COVID-19 and governments' responses to it. Report for France.
[2] https://www.santepubliquefrance.fr/maladies-et-traumatismes/maladies-et-infections-respiratoires/infection-a-coronavirus/articles/covid-19-prendre-soin-de-sa-sante-mentale-pendant-l-epidemie

the risks for the mental health of the population could be important.

The results of subsequent survey waves are available online at the following address: https://www.santepubliquefrance.fr/etudes-et-enquetes/covid-19-une-enquete-pour-suivre-l-evolution-des-comportements-et-de-la-sante-mentale-pendant-l-epidemie ∎

Competing interest

None declared.

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