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## Influence of lockdown on spinal pain: a preliminary report on use of the “2020 lockdown questionnaire”

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### ABSTRACT

**Background:** In order to contain the spread of the Covid-19 pandemic in Italy, a lockdown was issued in March 2020, which has forced people to spend much more time at home. While it is recognised that the associated change in life habits has changed their psychological well-being, quality of life also depends on physical well-being. This is particularly important for those with musculoskeletal conditions, such as spinal pain.

**Objectives:** Recognising that spinal pain is a bio-psycho-social pathology, we developed a questionnaire to investigate potential associations between the level of disability caused by spinal pain (that arose or increased during the lockdown period) and the perception of the respondents with respect to the limitations of activities of daily living.

**Methods:** In the absence of similar tools in the literature, a dedicated questionnaire tool was developed and piloted. It consists of 4 parts: two self-report questionnaires specially formulated for this study, and two already validated questionnaires. It was administered to 110 participants from 10 private rehabilitation facilities. All subjects were of age and had lumbar and/or cervical spine pain occurring before or during the lockdown period with non-traumatic etiopathogenesis.

**Results:** The majority of participants perceived their spine pain as having arisen or increased during the lockdown period. The existence of a probable connection between this perception and the degree of disability at the time of the survey is confirmed by the contingency tables between this item of the second questionnaire and both disability scales which showed a statistically significant correlation.

**Conclusions:** The survey tool was found to be valid in this population, and is recommended for further studies.

### KEYWORDS

Covid-19; lockdown; back pain; quality of life; questionnaire

## Introduction

2020 will unfortunately and sadly be remembered globally as the year of the COroNaVIrusDIsease 19 pandemic, also known as acute respiratory disease from SARS-CoV-2, or Covid-19. In Italy between February and November 30, 2020, 1,651,229 positive cases of Covid-19 were diagnosed by the regional reference laboratories and 57,647 deaths occurred in people positive for the virus [1]. Cases of Covid-19 infection gradually increased from early February 2020; to limit the number of cases, the President of the Council of Ministers of Italy issued the decree (DPCM) on 11 March 2020 with provision of restrictions, publicly known as the national “lockdown”. This first emergency period officially ended on May 17, 2020, with the subsequent publication of the Prime Minister’s Decree for the relaxation of containment measures.

During the lockdown, people were forced to spend much more time at home and, where

practicable, to carry out their work in “smart working”: that is, remotely, through online working. All this has led to important changes in the lifestyle of Italians, but above all in the quality of their life and their state of well-being, as reported by the Working Group “Mental health and Covid-19 emergency” of the Istituto Superiore di Sanità; this group monitored these effects from the early stages of the lockdown, noting “*an evident impact of the pandemic on mental health, in terms of perceived stress and the presence of anxious and depressive symptoms.*” [2].

Giallonardo and colleagues [3] have also highlighted that in the event of a pandemic such as Covid-19, everyone can feel “threatened” as the virus can be anywhere and can be transmitted by everyone next to us. Therefore, people living in cities most severely affected by the pandemic perceive extremely high levels of uncertainty and concern for the future, due to the fear of being infected; this in turn serves to increase their anxiety and reduce their well-being.

From these studies it has become clear that the lockdown has on one hand negatively impacted individuals' daily activities, however it has highlighted the importance of understanding of the relevance of social relationships, and of the context in which we live, in order to guarantee a good level of mental health and quality of life.

The impacts of the lockdown on people's physical well-being should equally not be underestimated. In fact, changes in habits such as reduced motor activity or working remotely, in an often inadequate working environment, can also lead to physical problems such as back pain.

It is important to remember that spinal pain, whether of the cervical type, causing neck pain or of the lumbar type, causing low back pain, is one of the most widespread pathologies globally. It is present in both sexes although more frequent in women and the age group most affected is that between 45 and 59 years [4]. The Global Burden of Disease Study [5] showed that low back pain is among the top ten diseases with the highest social impact, while neck pain [6] was the fourth highest cause of lost years of work due to disability. Furthermore, the ISTAT (the Italian Institute of Statistics) data on health and safety at work in Italy [7] reported a marked increase in pain in the spine from 2007 to 2013, indicating low back pain as the primary cause of health problems among workers in 2013. According to more recent data [8] among office workers, it was found that 61% of subjects interviewed had at least one episode of back pain in the last 3 years; it was estimated that the costs for absenteeism related to this type of disorder are very high with heavy economic and social repercussions [4].

Spinal pain is recognised as a bio-psycho-social pathology, i.e. a pathology in which biological, psychological, and social factors contribute to the clinical presentation. In fact, psychological variables such as anxiety, stress, and anguish can play a key role in the development of pain as evidenced by Papageorgiou and collaborators [9] in a cohort study of people who had not previously reported lower back pain; this showed an increased risk of onset of this pain in both workers and unemployed people with low mood.

It is widely accepted that the presence of pain negatively impacts the individual in carrying out daily activities, and in terms of interpersonal relationships, with consequent repercussions on the individual's emotional health and well-being.

Spinal pain, anxiety, and lifestyle habits are therefore certainly very closely linked to each other, and the individual's level of well-being depends on all three. Recognising this, we carried out a survey to

explore these issues as they related to the 2020 lockdown in Italy; for this, we developed a composite "2020 lockdown questionnaire".

The main aim of the study was to investigate the relationships between the level of disability caused by spinal pain (cervical and/or lumbar), which arose or increased during the lockdown period, and the perception of interviewees regarding impacts and limitations in respect of activities of daily living, and their well-being.

## Materials and methods

Given the lack of a specific questionnaire tool, for this study we developed and used a "2020 lockdown questionnaire"; this was designed as a dedicated tool to investigate perceptions and life habits during lockdown in a sample of patients with spinal pain.

### Survey population

The survey was carried out by administering the anonymous questionnaire to 110 participants from 10 private rehabilitation centers in the Florence-Prato-Pistoia area (1.553.476 inhabitants). All the adults (over 18 years old) who, in the quarter from May to July 2020, voluntarily presented themselves in the 10 centers involved in the study due to their lumbar and/or cervical non-traumatic spine pain arose or increased during the lockdown period, were selected by the physiotherapy triage of the centers. All filled questionnaires were returned to the investigators at the end of July. We decided to set a short enrolment time, as we were interested in preserving a temporal contingency between lockdown and observational period despite of a lackness in sample size.

### Survey tool

The "2020 lockdown questionnaire" consists of 4 parts: two self-report questionnaires specially formulated for this study, and two already validated questionnaires, the Italian versions of Neck Disability Index Questionnaire (NDIQ) and of the Roland and Morris Disability Questionnaire (RMDO) [10–13]. The first self-report questionnaire aimed to give a descriptive picture of the survey sample. It consisted of 6 questions, which investigated how the respondent's domestic and work habits had to be altered or changed during the lockdown period (including: type of work carried out in the period, number of hours spent sitting, type of session used, area of the affected spine, age group, sex). Adaptations were expressed as descriptive frequencies with a score to

be considered as a nominal variable in the statistical analysis.

The second self-report questionnaire consisted of 13 questions with multiple choice answers, with scores on a Likert scale with a value from 1 to 4, with the following criteria for assigning scores to the questions (1 = No, 2 = Little, 3 = Enough, 4 = A lot). The 13 questions were related to the subject's perception of the relationship between their pain and the period lived in lockdown, and how much this public health intervention had affected their lifestyle habits (onset or increase in pain, adequacy of pharmacological treatments during the period, availability of drugs, change in lifestyle, decrease in the possibility of access to health facilities, less willingness to carry out outdoor activities, independent physical activity, quality of medical-physiotherapy "counselling", changes in domestic habits in relation efforts, smart working/sitting activities for prolonged times, quality of sessions, quality of daily rest, level of anxiety).

The third questionnaire was the Italian language version of the Neck Disability Index Questionnaire (NDIQ), which was developed for the investigation of cervical spine pain and its impact on function including activities of daily living. The Italian version of Monticone *et al* was adopted for the study. [11].

The fourth questionnaire was the Roland and Morris Disability Questionnaire (RMDQ) [12], which was developed for Low back pain, with the same objectives as above. The RMDQ in its Italian version was used [13].

Each participant was asked to fill in the first two self-report parts completely and independently, as well as, selectively, the NDI or RMDQ based on the location of the pain.

The questionnaires were then collected and data entered in a single database for all the variables (without considering the centers of origin).

### Statistical analysis

*IBM SPSS Statistics vers 26 software was used for the statistical analysis.*

*For the description of the sample, a frequency analysis of the responses of the first questionnaire was carried out. The same procedure was used for the answers of the second in order to be able to interpret the general perception of the sample regarding the topic under study.*

*Kendall's Tau-B correlation index was used to correlate the answers to the individual questions of the second questionnaire and, respectively, the disability scales for the cervical spine and lumbar spine as*

*appropriate. Test results with  $p < 0.05$  were considered statistically significant.*

### Results

All participants in the "2020 lockdown questionnaire" ( $n = 110$ ) answered the questions of the first and second self-report questionnaires; 94 out of 110 participants answered the Neck Disability Index Questionnaire (NDIQ) or the Roland and Morris Disability Questionnaire (RMDQ) or both. The data relating to the first two questionnaires are reported in Tables 1 and 2 respectively.

From the analysis of the descriptive frequencies relating to the first questionnaire, it emerges that in this sample, the age group most affected by spinal pain is between 41 and 60 years, and that it is more frequent in women than in men. This is in line with expectations of demographics in the wider population of people with spinal pain.

From the responses of the participants to the second questionnaire it mainly emerges that 92.6% believed they had changed their lifestyle habits compared to the period before lockdown. 85.5% perceived that the reduced opportunity of carrying out outdoor activities had a negative impact on pain. 80.9% perceived their state of anxiety increased. 75.5% reported an increase in their habits of lifting weights, and overstraining in housework.

Seventy percent of the participants perceived pain as arising or increasing due to the lockdown period. 66.4% believed that activities carried out in smart working or those characterized by a long period of sitting had a negative impact on pain. 65.5% replied that the possibility of accessing health facilities had decreased.

The frequency analysis of the disability "clusters" resulting from the neck (NDIQ) and back (RMDQ) questionnaires are presented respectively in Tables 3 and 4; this analysis shows that more than 70% of participants (in both questionnaires) had minimal disability, even though they reported spinal pain that caused them to be placed in a rehabilitation program.

Contingency tables between responses for the second questionnaire and the NDIQ showed only one statistical significance ( $\tau_B$  0.238;  $p$  0.037) in the correlation between the scale in question and the perception by the subjects that their pain had arisen or increased during the lockdown period. This same correlation, for RMDQ, was also statistically significant ( $\tau_B$  0.281;  $p$  0.008). Furthermore, the contingency table between the RMDQ and the 13 questions of the self-report questionnaire highlighted other statistically significant associations, such as the correlation between the clusters of this

**Table 1.** Sample description. Frequency analysis of responses to the descriptive questions of the "2020 lockdown questionnaire".

Sample Description		Freq	%
What kind of work did you do during this time?	Smart Working	24	21,8
	In attendance	25	22,7
	Both	9	8,2
	None	52	47,3
	Total	110	100,0
How long have you been sitting in this period (no of hours)?		Freq	%
	0-4	29	26,4
	4-6	34	30,9
	6-8	31	28,2
	>8	16	14,5
What types of seats were mainly used during the long sitting period?	Totale	110	100,0
		Freq	%
	Stool	2	1,8
	Kitchen chair	21	19,1
	Sofa	36	32,7
Which part of the spine is affected by pain?	Desk chair	51	46,4
	Total	110	100,0
		Freq	%
	Lumbar	37	33,6
	Cervical	20	18,2
Please indicate the age range	Both	53	48,2
	Total	110	100,0
		Freq	%
	18-25	19	17,3
	26-40	23	20,9
	41-60	36	32,7
Please indicate your gender	61-80	27	24,5
	>80	5	4,5
	Totale	110	100,0
		Freq	%
	M	51	46,4
F	59	53,6	
Totale	110	100,0	

disability index and the perception by participants of having changed their lifestyle habits in the lockdown period ( $\tau B$  0.223;  $p$  0.055), as well as for the perception of an influence on pain of the reduced opportunity for access to health or specialist facilities ( $\tau B$  0.236;  $p$  0.032).

Analysis of responses of those subjects who answered both questionnaires on disability due to spinal pain, i.e. those who perceived pain in both segments, shows only one statistical significant association in the correlation between the RMDQ clusters and the first question of the questionnaire self-report on the perception of increased or onset of pain due to the lockdown period ( $\tau B$  0.316;  $p$  0.016).

## Discussion

The composite "2020 lockdown questionnaire", as used for the first time in this study, was found to be a suitable tool to highlight the bio-psycho-social and functional aspects relating to the perception of spinal pain for these participants during lockdown.

In accordance with the available data on spinal pain, the majority of the population of our sample was female, with an age between 41 and 60 years.

Our results showed that the vast majority of survey participants perceived their spine pain as having

arisen or increased during the lockdown period. The existence of a probable connection between this perception and the actual degree of disability at the time of the survey is confirmed by the contingency tables between this question of the second questionnaire and both disability scales; these both showed a statistically significant correlation between the scale in question and subject' perceptions that their pain had arisen or increased during the lockdown period. A statistically significant correlation was also found between clusters of the RMDQ disability index and participants' perception of having changed their lifestyle habits during the lockdown period and the perception of an influence on pain of less access to health facilities. These data, together with responses that highlighted reduced physical activity and a notable increase in the state of anxiety, confirm that spinal pain is a pathology that depends not only on the individual's physical state, but also on their psychological one. Presti *et al.* [14] using both a subjective and objective approach have highlighted these associations between pain, quality of life, and well-being.

On the other hand, by analyzing other research in the psychological field, carried out in recent months both during and after the lockdown, it emerges that confinement in the home has had negative impacts on mood and anxiety for people,

**Table 2.** Self-report questionnaire. Frequency analysis of the answers to the self-report questions of the "2020 lockdown questionnaire".

Self-Report Questionnaire		Freq	%
Do you think the pain has arisen or increased due to the lockdown period?	No	33	30,0
	A little	28	25,5
	Enough	34	30,9
	A lot	15	13,6
	Total	110	100,0
Do you think you have received adequate pharmacological treatments (anti-inflammatory and muscle relaxants) in terms of quantity during this lockdown period?	–	4	3,6
	No	41	37,3
	A little	15	13,6
	Enough	40	36,4
	A lot	10	9,1
	Total	110	100,0
Do you think that, given the restrictions in place, the availability of drugs in pharmacies has decreased compared to before the lockdown?	–	2	1,8
	No	62	56,4
	A little	18	16,4
	Enough	20	18,2
	A lot	8	7,3
	Total	110	100,0
Do you think you have changed your life habits a lot compared to the previous period?	No	8	7,3
	A little	15	13,6
	Enough	49	44,5
	A lot	38	34,5
	Total	110	100,0
Do you think that the possibility of having access to health or specialist facilities has decreased and that this has negatively affected the possibility of treatment in the acute phase of pain?	–	3	2,7
	No	17	15,5
	A little	18	16,4
	Enough	42	38,2
	A lot	30	27,3
	Total	110	100,0
Do you believe that the reduced availability of being able to carry out outdoor activities has negatively affected the pain from low back pain or neck pain?	–	1	,9
	No	15	13,6
	A little	17	15,5
	Enough	46	41,8
	A lot	31	28,2
	Total	110	100,0
Did you perform guided or self-managed physical activity during this limitation period?	No	29	26,4
	A little	36	32,7
	Enough	30	27,3
	A lot	15	13,6
	Total	110	100,0
Do you think that you have received from your doctor or physiotherapist sufficient advice on exercises or activities that could mitigate or improve the amount of pain?	–	2	1,8
	No	26	23,6
	A little	25	22,7
	Enough	47	42,7
	A lot	10	9,1
	Total	110	100,0
Do you think that your habits regarding lifting weights and / or making efforts at home have changed during this period of lockdown?	No	27	24,5
	A little	40	36,4
	Enough	32	29,1
	A lot	11	10,0
	Total	110	100,0
Do you think that the activities carried out in smart-working or those characterized by a long period of sitting, have negatively influenced the amount of pain?	–	5	4,5
	No	11	10,0
	A little	21	19,1
	Enough	54	49,1
	A lot	19	17,3
	Total	110	100,0
Do you think they were suitable seats for what you were doing (work, watching TV or staying at the computer, relaxing)?	No	11	10,0
	A little	37	33,6
	Enough	56	50,9
	A lot	6	5,5
	Total	110	100,0
Do you think that overall, your quality of daily rest has improved?	–	5	4,5
	No	11	10,0
	A little	21	19,1
	Enough	54	49,1
	A lot	19	17,3
	Total	110	100,0
Do you think that overall, your quality of daily rest has improved?	No	43	39,1
	A little	38	34,5
	Enough	27	24,5
	A lot	2	1,8
	Total	110	100,0
			Freq

(continued)



**Table 2.** Continued.

Self-Report Questionnaire		Freq	%
Do you think that overall the level of anxiety in your daily life has increased?	No	21	19,1
	A little	30	27,3
	Abbastanza	43	39,1
	A lot	16	14,5
	Total	110	100,0

**Table 3.** NDIQ clusters. Frequency analysis of the disability clusters resulting from the compilation of the Neck Disability Index Questionnaire.

NDIQ CLUSTERS	Freq	%
Minimal disability	48	70,6
Moderate disability	11	16,2
Severe disability	7	10,3
Invalidity	2	2,9
Total	68	100,0

**Table 4.** RMDQ clusters. Frequency analysis of the disability clusters resulting from the compilation of the Roland & Morris Disability Questionnaire.

RMDQ CLUSTERS	Freq	%
Little or no disability	47	71,2
Minimal disability	13	19,7
Moderate disability	4	6,1
Severe disability	2	3,0
Total	66	100,0

and how these are correlated with an increased perception of suffering and pain [15].

Ours was a preliminary study which, using the "2020 lockdown questionnaire" identified a correlation between pain perception in the lockdown period, and the degree of disability due to spinal pain. Therefore, given the predicted further expansion and development of smart working options, these preliminary results support the questionnaires used here as a useful tool to develop new measures and strategies in order to reduce the onset of cervical or lumbar spine pain.

Obviously this kind of study has some limitations, first of all the sample size is small even if we do not have certain epidemiological data concerning the population with spinal pain in the analyzed geographic area. Secondly, it would be interesting to test the "2020 lockdown questionnaire" in countries around the world where the lockdown rules are different from Italy in order to detect the generalizability of the tool. Third, it would be necessary to better analyze the correlations found in this study by searching for real cause-effect relationships, thus using higher methodological studies.

In conclusion, adopting a complex tool, such as the "2020 lockdown questionnaire", which incorporates components for assessment of pain and function, could better to face the challenge of pain in the future with better informed therapeutic approaches, physiotherapy, and personalized psychology.

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