

Article

COVID-19 lockdown: Impact on online gambling, online shopping, web navigation and online pornography

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Abstract

Background: The COVID-19 pandemic and control measures may have had an impact on unpleasant emotions experienced during the lockdown (LD). This may have increased the number of hours spent online and could have impacted the quality of the enacted behavior, in terms of loss of control of Internet use. In this online survey, we were interested in measure how much loss of control was perceived regarding online gambling, online shopping, the fruition of online pornographic content and web navigation.

Design and methods: The online survey was carried out during the COVID-19 pandemic in the post-lockdown and 1232 subjects participated in the survey. In the participating sample, healthcare workers (HW) were 43.1% of the sample, of which 18.7% were directly involved in the Coronavirus emergency, and 52.3% of the sample is not a HW. Only 0.6% of the sample gambled online and 37.5% of those reported losing control of their gambling mode. Most of the sample shopped online during the LD (70.1%), but only 7.2% of those lost control by buying and/or spending more than what they had set themselves.

Results: Significant data emerged showing that those who lost control while online shopping also lost control regarding the amount of time spent online ($p < 0.001$); 21.6% of the sample, reported making use of online pornographic material during LD, 4.7% of them stated that the frequency increased and 5.1% reported losing control by having spent more money or more time than what was intended. Finally, 44.7% of the sample have experienced loss of control during the web navigation. Furthermore, during the LD 67.8% of the sample reports having experienced unpleasant emotions. Of these, 8.4% state that they enacted behaviors such as online gambling, online shopping, online pornographic material viewing and web navigation to counter their negative emotions. Interestingly, we found a correlation between loss of control during web navigation and online shopping and the emotional states “upset”, “scared” and “restless” ($p < 0.05$).

Conclusion: To conclude, there was no significant increase in potentially addictive behaviors, nor an increase in loss of control

of these behaviors when enacted online. However, the loss of control in online shopping and web navigation was significantly correlated to the unpleasant emotional states of nervousness, fear and restlessness, whereas those who reported feeling strong and able to handle the situation experienced a lower loss of control in their web navigation. These correlations may suggest that these online behaviors may act as modulators of unpleasant emotional states.

Introduction

One of the most relevant events of global significance since the beginning of the millennium is no doubt the spread of the SARS-CoV-2 coronavirus, which has been declared a pandemic by the World Health Organization (WHO) since March 11, 2020. Its socioeconomic and psychological impact has been so great, that it has been considered a psychosocial catastrophe.^{1,2} The radical changes in modus vivendi and the persistent perceived threat to one's survival have had the magnitude of a traumatic event that introduced a breaking point between life pre- and post-lockdown (LD) not unlike a natural disaster, that is an event of unpredictable arrival and duration (source: Italian Prime Minister's Office, 2020). Indeed, trauma represents a complex emotional response to a stressful life-threatening event, regarding which one feels helpless. The traumatic event is not easily integrated nor processed by the individual due to its pervasive nature; therefore, trauma response is associated to psychological and behavioral alterations such as emotion regulation disorders, alterations in the person's system of meanings and dysfunctional defense mechanisms. Starting from this definition of trauma, COVID-19 can be seen as the cause of individual and collective traumas,^{3,4} the recovery from which has not been facilitated by the support of physically close loved ones due to preventive measures such as the stay-at-home order and social distancing, in addition to the fear of getting sick, of being hospitalized, of dying alone in the hospital or of infecting friends and family members.⁵

Given the scope of the event, the Addiction Medicine team (AM) decided to evaluate the coping skills of the Italian popula-

Significance for public health

This online survey was carried out during the COVID-19. The COVID-19 pandemic and control measures may have had an impact on unpleasant emotions experienced worldwide during the lockdown and online behaviors, such as online gambling, online shopping, the fruition of online pornographic content and web navigation, may act as modulator of unpleasant emotions. These online behaviors may be potentially addictive for people with a vulnerability in developing an addiction disorder and may represent a new challenge for the public health system.

tion in the context of the pandemic. Measuring psychological suffering and distress in phase 1 of the pandemic, which corresponds to the “hot” phase of a traumatic event, is an important element to predict and prevent the risk of future development of Post-Traumatic Stress Disorder (PTSD). Peritraumatic stress reactions refer to behavior, emotions, thoughts and symptoms associated with stress during or immediately after the traumatic event.⁶

The set of containment and contrast measures defined and implemented by the Italian executive against the COVID-19 diffusion have suddenly revolutionized one’s own routine, social life, means of access to work and the fruition of the most diverse services, along with the delivery of courses and exams for schools at all levels. The requirement to go out of one’s apartment only for matters of proven urgency and necessity, along with the near-total closing of offices, shops, schools and universities, in addition to causing a restriction of personal liberty have necessarily led to changes in internal emotional states and an increase in the use of Internet and online platforms, which have been the almost exclusive link between one’s own four walls and the outside world in this period of “forced confinement”.

During the LD, the time spent online has inevitably increased: training activities, work, socializing, shopping and leisure have taken on an almost exclusively digital set-up. During the LD, the existential constant for young and not-so-young alike has been the so-called On-Life¹: more than in the recent past, it has become obvious how it is no longer possible to clearly distinguish “real life” from “virtual life”, “Vital, relational, social and communicative dimensions are the result of a continuous interaction between the material, analog reality and the virtual, interactive reality”.

Due to the extraordinary scope of the event several studies have been conducted, also in Italian contexts, in order to evaluate changes in lifestyle,⁷ the psychosocial effects induced by the pandemic,^{1,8} along with consumer habits, the manners of use of gambling,⁹ addictions and the relationship with digital media.^{10,11}

Di Renzo and colleagues, for example, reported that during the LD 37.3% of the 3533 Italian subjects involved in their study (from Northern to Southern Italy) modified their eating habits, even though only 16.7% of them made improvements by following a balanced diet.⁷ Regarding tobacco use, 3.3% of the sample has reportedly stopped smoking during the LD, probably due to the fear of incurring in a greater risk of developing respiratory problems and dying because of the COVID-19.^{7,12} From a psychological point of view, conversely, it appears that the Italian general population has reported a high prevalence of mental health issues during the last few weeks of the LD.⁸ A study conducted in China on 1210 subjects residing in 194 different cities shows that 53.8% of the sample reported a moderate to severe psychological impact of COVID-19, with moderate to severe depressive symptoms in 28.8% of cases and moderate to severe suffering in 8.1% of cases.¹³ Another Chinese study conducted on 7236 people found symptoms of anxiety in 35% of participants, depression in 20.1% and sleep disturbances in 18.2% of participants.¹⁴ In an Italian study, 24.7% of the sample (1515 subjects) presented depressive symptoms and 23.2% an anxiety disorder. Regarding sleep quality, it emerged that 42.2% of the sample exhibited sleep disorders and, of these, only 1.1% manifested severe clinical insomnia.⁸ Healthcare professionals and people living in Northern Italy have perceived a significantly higher impact of the epidemic on their health compared with people not working in healthcare and people living in Central and Southern Italy.¹

¹ Neologism devised by the Italian philosopher Luciano Floridi, a portmanteau of the terms online and offline: on life is what happens and what is done when life goes on, while being connected to interactive devices (on + life).

Scientific literature highlights the fact that psychoactive substance use and other potentially addicting behaviors such as gambling, playing videogames, watching TV series, using social media, watching pornographic content and web navigation have often been employed to reduce stress and anxiety or to lift a low mood.^{11,15} Therefore, the tendency to use psychoactive substances or enact said behaviors as putative coping strategies to manage a moment of crisis, such as the one that was triggered by the COVID-19 pandemic, considerably increases the chances of developing behavioral conducts that may be difficult to eradicate,¹⁶ and habits that can evolve in problematic behaviors. Indeed, to intervene for preventive purposes on problematic Internet use during the pandemic, an international and interdisciplinary group of experts in the matter has prepared some guidelines for the general and clinical population.¹⁵

Literature shows that Internet use, especially regarding access to websites relative to pornography and videogames, has considerably increased during the LD.¹⁵ Among behavioral addictions, Internet addiction (especially regarding the use of social media), online sex and videogame addiction stand out at the top of the list.^{15,16} Eating disorders and compulsive shopping are less prevalent in the Indian context, but they are increasingly reported in Western Countries.^{17,18}

The quarterly report by Salesforce (2020), the world-leading company in Customer Relationship Management, reports that digital purchases during the quarantine have quickly surpassed the entity of online shopping during the Christmas holidays, and that between March 10th and 20th 2020 the amount of money spent to buy basic commodities *via* digital means rose by 200%, remaining high throughout the quarter.

Regarding gambling, an online survey conducted in Sweden revealed that only 4% of the participants (74 subjects) had increased their gambling behavior in response to the pandemic; a more in-depth analysis revealed that this subgroup significantly correlated with a greater severity of gambling addiction, lower age, a longer permanence inside their homes, greater alcohol consumption, psychological discomfort and a history of social withdrawal; for these reasons, this subgroup may represent an especially vulnerable population to which specific care services should be given.⁹ Starting from this background, AM questioned how much the possible presence of unpleasant emotional states and the increase in the number of hours spent online could have impacted the quality of the enacted behavior, in terms of loss of control of Internet use. Specifically, we were interested in how much loss of control was perceived regarding online gambling, online shopping, the fruition of online pornographic content and web navigation.

Design and methods

The survey was carried out during the COVID-19 pandemic in the post-LD period (from May 18th to June 26th, 2020) by means of an online questionnaire developed using Google Forms, an app to create online surveys. The questionnaire required 10 min to be filled out and it was distributed *via* social networks and the AM mailing list. To broaden the involvement in the survey, messaging apps were also employed. Participation in the survey was voluntary and without compensation.

The questionnaire comprises 56 items. The first section examines the socio-demographic characteristics of the subjects: gender, age, region and province of residence, region in which the LD was spent, employment status, marital status, and the presence of cohabiting individuals. Moreover, we asked if the interviewee was a healthcare worker or an active volunteer worker during the health

emergency or not, if he or she had contracted the virus, if he or she had ever been hospitalized due to a COVID-19 infection or if a cohabitee had gotten sick.

In the second section, four potentially addictive online behaviors were examined: online gambling, online shopping, online pornography and aimless web navigation. For each of these behaviors, the presence of the behavior before the LD and its variations during the LD, in terms of frequency and loss of control of the behavior, were investigated. In the third section, 20 mood states referring to the LD period were listed, each to be evaluated using a 5-point Likert scale (from not at all to very much). Participants were asked if the presence of unpleasant emotions led them to enact the said online behaviors and if enacting them effectively alleviated their unpleasant emotions.

Statistical analysis

All tests were carried with the IBM SPSS version 20.0 statistical package. The Pearson's chi-square test was used for categorical variables, $p < 0.05$ (two-tailed) was taken as the significance threshold for all the tests.

Results

One thousand two hundred and thirty-two (1232) subjects participated in the survey. Of these, 1202 gave their informed consent, but data from 1196 responders were deemed valid. The sample comprised 35.1% males and 64.6% females; 0.3% of subjects reported their gender as "other".

The mean age of the sample is 43.25 years ($SD \pm 14.5$). Regarding employment status, 19.4% of the subjects do not currently have a job (pensioners, students, unemployed), 60.5% are employees, 20.1% are independent professionals. In Table 1 the marital status of the sample is shown. Regarding the geographic distribution of the sample, the data were divided into four areas: Veneto, Lombardy, Piedmont (the regions which were most affected by the SARS-CoV-2 virus), and a single category comprising the remaining Italian regions; 51.8% of the sample spent the LD in Veneto, 15% in Lombardy, 2.1% in Piedmont, and 31.1% in another Italian region. In the participating sample, healthcare workers (HW) were 530 (43.1% of the sample), of which 18.7% were directly involved in the Coronavirus emergency; 52.3% of the sample is not a HW, and 1.7% was an active volunteer worker during the pandemic; 2.9% of the sample provided no answer.

Data regarding SARS-CoV-2 infection of the responders are listed in Table 2. Going into detail, we divided the sample for infection status and field of employment (Table 3). Merging the data regarding both the certainty and the possibility of having contracted COVID-19 (Table 3), 6.4% of the subjects may have been infected; 28.8% of the sample had a negative swab test, while

64.5% believes to not have been infected; 0.2% of the sample has been hospitalized for an acute clinical picture due to COVID-19. For statistical analyses we separately considered each of the four potentially addictive online behaviors that were investigated. Before the LD, 1.6% of the interviewees had gambled live. During the LD, 2.2% managed to gamble live, 0.6% of the sample gambled online and 1.7% reported an increase in online gambling frequency. Of those who had gambled online (8 subjects), 3 reported losing control of their gambling mode (37.5% of those who had gambled online during the LD). Regarding online shopping, 74.7% of the sample had made online purchases before the LD, while 70.1% of the sample shopped online during the LD. The frequency of online shopping during the LD proves unchanged in 56.1% of cases, increased in 14% of cases and decreased in 29.9% of cases. Sixty subjects (7.2%) out of those who have shopped online during the LD stated that they lost control by buying and/or spending more than what they had set themselves. Significant data emerged showing that those who lost control while online shopping also lost control regarding the amount of time spent online ($p < 0.001$). In Table 4, the sampling distribution regarding participants' loss of control of the time spent online, divided by HW and NHW, is shown. Two hundred and fifty-seven (257) subjects, 21.6% of the sample, reported making use of online pornographic material during the LD; more in detail, 90.1% of them stated that the frequency

Table 1. Marital status of the participants.

Marital status	n	%
Single	375	31.4
Married/cohabiting	720	60.2
Separated	90	7.5
Widower	10	0.8
No answer	1	0.1
Total	1196	100

Table 2. SARS-CoV-2 contagion data.

SARS-CoV-2	n.	%
Yes, positive swab test	17	1.4
Maybe, no swab test	59	4.9
I don't think so, no swab test	773	64.6
No, negative swab test	346	28.9
No answer	1	0.2
Total	1196	100

Table 3. Infection status and field of employment.

Infection status	Employment category (%)				Total
	Active HW*	Inactive HW	Active volunteer	NHW	
Yes	11 (4.8)	3 (1.0)	0 (0)	3 (0.5)	17 (1.4)
I think so, no swab test	10 (4.4)	20 (6.7)	0 (0)	29 (4.5)	59 (4.9)
I don't think so, no swab test	67 (29.3)	149 (49.7)	17 (81.0)	539 (84.0)	772 (64.5)
No, negative swab test	141 (61.6)	128 (42.7)	4 (19.0)	71 (11.0)	344 (28.8)
No answer					4 (0.3)
Total	229 (100.0)	300 (100.0)	21 (100.0)	642 (100.0)	1196 (100.0)

HW, health worker; *active in the health emergency; NHW, non-health care worker.

of their fruition of online pornographic content remained unchanged, for 5.2% it decreased, for 4.7% it increased. Of those that had made use of online pornographic material, 5.1% (n=13) report losing control by having spent more money or more time than what was intended. During the LD, 67.8% of the sample (n=835) reports having experienced unpleasant emotions. Of these, 8.4% (n=104) state that they enacted behaviors such as online gambling, online shopping, online pornographic material viewing and web navigation to counter their negative emotions. Dividing the sample in HW and NHW, no significant differences in said

behaviors emerge. We will now analyze in detail the emotions that participants in the study reportedly experienced during the LD. Dividing the sample in two populations, HW and NHW, we obtained what is shown in Table 5. In Table 6 it emerges that only irritability is significant, that is the NHW group manifests higher levels of irritability than the HW group. Considering the specific sample of HW, both active and inactive during the pandemic, no significant differences regarding the emotions experienced during the LD arise.

Table 4. Non-health worker vs health worker and loss of control regarding the amount of time spent online.

Population	I did not lose control	I lost control	Total	p
Non-health worker	223 (51.3)	212 (48.7)	435 (100.0)	<0.05
Health worker	168 (61.8)	104 (38.2)	272 (100.0)	<0.05
Total	391 (55.3)	316 (44.7)	707 (100.0)	<0.05

Table 5. Emotional status of the participants.

Employment status	Upset					Total	p
	1 (not at all)	2	3	4	5 (very much)		
Non-health worker	11.3	20.7	32.2	26.8	8.9	100.0	>0.05
Health worker	8.5	23.1	32.3	28.9	7.2	100.0	>0.05
Total	10.1	21.8	32.3	27.7	8.2	100.0	>0.05

Employment status	Scared					Total	p
	1 (not at all)	2	3	4	5 (very much)		
Non-health worker	19.5	25.9	30.8	17.8	6.0	100.0	>0.05
Health worker	16.9	33.3	23.7	19.9	6.3	100.0	>0.05
Total	18.3	29.2	27.6	18.7	6.1	100.0	>0.05

Employment status	Irritable					Total	p
	1 (not at all)	2	3	4	5 (very much)		
Non-health worker	14.8	24.5	29.3	23.1	8.3	100.0	0.018
Health worker	15.2	27.9	32.4	20.7	3.8	100.0	0.018
Total	15.0	26.0	30.7	22.0	6.3	100.0	0.018

Employment status	Nervous					Total	p
	1 (not at all)	2	3	4	5 (very much)		
NHW	15.0	21.5	30.2	25.6	7.6	100.0	>0.05
HW	12.5	25.9	34.2	24.2	3.2	100.0	>0.05
Total	13.9	23.5	32.0	25.0	5.6	100.0	>0.05

Employment status	Restless					Total	p
	1 (not at all)	2	3	4	5 (very much)		
Non-health worker	23.6	27.5	24.5	18.6	5.7	100.0	>0.05
Health worker	24.9	28.3	26.8	18.3	1.7	100.0	>0.05
Total	24.2	27.9	25.5	18.4	4.0	100.0	>0.05

Employment status	Strong, able to handle situations					Total	p
	1 (not at all)	2	3	4	5 (very much)		
Non-health worker	9.8	20.8	25.2	31.5	12.7	100.0	>0.05
Health worker	7.6	20.3	24.3	35.9	11.8	100.0	>0.05
Total	8.9	20.6	24.8	33.5	12.3	100.0	>0.05

Table 6. Emotive states and loss of control.

Emotive state	Loss of control	1	2	3	4	5	Totale	p
Upset	I did not lose control of the amount of time spent online	34 (8.7)	88 (22.6)	126 (32.3)	113 (29.0)	29 (7.4)	390 (100.0)	p<0.05
	I lost control of the amount of time spent online	23 (7.3)	58 (18.4)	92 (29.2)	103 (32.7)	39 (12.4)	315 (100.0)	
Scared	I did not lose control of the amount of time spent online	70 (17.9)	114 (29.2)	112 (28.6)	71 (18.2)	24 (6.1)	391 (100.0)	p<0.05
	I lost control of the amount of time spent online	47 (14.9)	79 (25.0)	92 (29.1)	68 (21.5)	30 (9.5)	316 (100.0)	
Restless	I did not lose control of the amount of time spent online	85 (21.8)	117 (30.0)	99 (25.4)	70 (17.9)	19 (4.9)	390 (100.0)	p<0.05
	I lost control of the amount of time spent online	52 (16.6)	67 (21.3)	97 (30.9)	76 (24.2)	22 (7.0)	314 (100.0)	
Strong	I did not lose control of the amount of time spent online	24 (3.1)	88 (11.4)	286 (36.9)	300 (38.7)	77 (9.9)	775 (100.0)	p<0.05
	I lost control of the amount of time spent online	4 (6.8)	20 (33.9)	19 (32.2)	10 (16.9)	6 (10.2)	59 (100.0)	
Upset	I did not lose control of my online shopping	74 (9.5)	152 (19.6)	266 (34.3)	220 (28.4)	63 (8.1)	775 (100.0)	p<0.05
	I lost control of my online shopping	3 (5.0)	12 (20.0)	13 (21.7)	24 (40.0)	8 (13.3)	60 (100.0)	
Scared	I did not lose control of my online shopping	145 (18.7)	201 (25.9)	237 (30.5)	150 (19.3)	43 (5.5)	776 (100.0)	p<0.05
	I lost control of my online shopping	8 (13.3)	17 (28.3)	9 (15.0)	16 (26.7)	10 (16.7)	60 (100.0)	
Restless	I did not lose control of my online shopping	166 (21.5)	218 (28.2)	209 (27.0)	149 (19.3)	31 (4.0)	773 (100.0)	p<0.001
	I lost control of my online shopping	6 (10.2)	15 (25.4)	17 (28.8)	17 (28.8)	4 (6.8)	59 (100.0)	

Discussion

The participating sample shows to be biased towards the female gender, with a 1:3 ratio. Mean age covers quite a wide range, offering a quite heterogeneous sample from this point of view. The sample's employment status presents a 2:10 ratio of unemployed individuals, with a balanced distribution regarding gender. The geographical distribution of the sample is clearly biased towards a higher prevalence of people that spent the LD in Veneto (51.8%). The infection status remained quite limited: 1.4% of participants are certain of having contracted COVID-19 and 4.9% suspect having gotten sick.

The population that participated in the study is not clinical but general, and indeed shows a low prevalence of gamblers (of any severity) and online players. As was evident from the data, the increase in online gambling has proven to be trifling in the reference sample, contradicting our expectations about a change in direction from offline to online gambling. The use of online apps and stores is ever more widespread and with a constant annual increase, and it is radically modifying our consumer goods shopping habits and means.¹⁹ In the sample considered in the present work, the habit of buying goods and services online is common: 2 people out of 3 already made use of online stores. With the LD and the closing of most productive and sales activities, the increase in online store revenues has been a predictable phenomenon. In our sample, 14% of subjects increased this practice. However, loss of control in online shopping has been limited: less than 1/10 has not been able to manage their online purchases. What is interesting, though, is the fact that those who lost control of their online shopping have also reportedly lost control of the time they spent online.

Regarding the emotional states we considered, it is important to highlight that the sample is quite randomly distributed between HW and NHW; that is, the different percentages that emerged aren't ascribable to the participants' employment status. Regarding irritability, we detected a significant difference between HW and NHW: in detail, it seems present in the NHW group. We also found a correlation between loss of control during web navigation and

online shopping and the emotional states "upset", "scared" and "restless". This correlation may suggest that these online behaviors may act as modulators of unpleasant emotional states.

Conclusions

Given the restrictions caused by the LD, we were expecting people to use the Internet more than they did before. The question we wanted to address was whether or not there could be a loss of control in online activities. From the survey, what emerges is that there was no significant increase in potentially addictive behaviors, nor an increase in loss of control of these behaviors when enacted online, so we did not find a change in trend towards online activity. However, it is interesting to note how the loss of control in online shopping and web navigation was significantly correlated to the unpleasant emotional states of nervousness, fear and restlessness, whereas those who reported feeling strong and able to handle the situation experienced a lower loss of control in their web navigation.

Limitations of the study

The survey was designed and implemented during the health emergency, which entailed a tight time schedule during the phenomenon itself. The objective has been that of creating a "photograph" of the state of the situation to understand whether or not the LD experience had led to an increase of potentially addictive online behaviors. Given the above, this work presents a few limitations:

- the sample is not randomized, but the data was collected through the contacts of the AD of Verona, and therefore influenced by a strong presence of HW;
- it was not possible to check that participants did not fill out the questionnaire more than once;
- no power analysis to estimate the necessary sample size was carried out;
- no standardized questionnaires were used.

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Key words: COVID-19; addiction; gambling; internet addiction; pornography.

Contribution: MB, SC, RG, FL, were responsible for the study concept and design; MB, GS, SC, RG contributed to the data acquisition; LZ, assisted with the data analysis and interpretation of findings; LZ, MB, SC, RG, drafted the manuscript. All authors critically reviewed the content and approved the final version of the manuscript for publication.

Conflict of interest: The authors report no conflicts of interest.

Disclaimer: The authors alone are responsible for the content and writing of this paper.

Availability of data and materials: All data generated or analyzed during this study are included in this published article.

Ethics approval and consent to participate: All procedures performed in studies involving human participants were in accordance with the ethical standards of the Institutional Research Committee and with the 1964 Helsinki declaration and its latest amendment.

Patient consent for publication: Not applicable.

Received for publication: 21 September 2020.

Accepted for publication: 15 January 2021.

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Journal of Public Health Research 2021;10:1759

doi:10.4081/jphr.2021.1759

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