Effects of COVID-19 school closure on schoolteachers' well-being: an explorative study from the AVATAR study

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Abstract

Background: Teachers are very often reported to be at higher risk for co-occurring mental disorders than other professional categories. Aim of this study was to assess well-being perception of school teachers and the indirect psychological effects of the COVID-19 emergency.

Methods: We collected data in April 2021, during COVID-19 lockdown from 838 teachers at public schools. Participants reported their perception of quality of life, by filling out a battery of psychological questionnaires through a multimedia platform.

Results: Having a family member with COVID in the last month increases anxiety (BAI, $p < 0.05$), reduces the perception of physical health (PWBI, $p < 0.05$) and vitality (PWBI, $p < 0.05$). In particular, anxiety (BAI, $p < 0.001$), depression (BDI-II, $p < 0.03$) and stress-related insomnia (FIRST, $p < 0.000$) increased significantly in women. In the male population, on the contrary, evaluation of well-being showed an increase in health perception ($p < 0.001$) and vitality ($p < 0.001$), also confirmed in the total score ($p < 0.001$).

Conclusions: The psychological difficulties of school teachers during COVID-19 underline the need to invest in prevention programs and promotion of well-being in this professional category, as the school remains the environment that allows teachers to provide structured learning opportunities to students.

Background

COVID-19 is a worldwide health emergency that has gripped us over the past two years. The prolonged lockdown period and the presence of the virus has led all individuals to forced isolation. If until now, social isolation represented an experimental extreme experience to study psychophysiological resilience, the COVID-19 pandemic has shifted this condition to real life.

Investigating the effects of social isolation in humans is not easy due to the various variables involved, so much so that the prevalence of data in the literature contain results mainly obtain from the animal studies in which negative effects on mood, myelination, and neurogenesis are described [1,2]. In humans, evidence about forced confinement, isolation, and privation come from SARS, Ebola, and H1N1 outbreaks quarantine, especially in healthcare professionals, documenting exhaustion, anxiety, irritability, insomnia, poor concentration, and deteriorating work performance [3,4].

With reference to the current COVID-19 pandemic, despite healthcare professionals are the professional category that has received the greatest attention, other figures outside of the hospital area play a major role, for example teachers. Already in normal condition, teachers are more often reported to be at higher risk for co-occurring mental disorders than other occupations [5,6,7]. Certainly, quarantine, school closures and the risk of infection due to social contacts, affects teachers' emotional reactions, and thus quality of life. Furthermore, it is important to point out that these effects on psychological dimension, also affects pupils, parents and school staff in general, who are directly or indirectly involved by the well-being of teachers [8]. Also, it should not be overlooked that classroom presence, direct communication

with students, face-to-face pedagogy and education have been replaced by monitor-based lessons conducted at a distance. Very often this method clashed with the various family realities, both for the lack of necessary teaching materials and for the lack of privacy within the home where the whole family was confined. Thus, although different studies conducted during the 2020 lockdown report teachers' psychological problems in the context of quarantine in Europe and America, no previous data to our knowledge are presented in Italian population. The aim of the present study was to explore well-being perception and the indirect psychological effects of COVID-19 emergency in a group of Italian teachers.

Methods

Data collection

Data for the present study represented the baseline explorative survey of AVATAR_schoolteachers. AVATAR project is aimed to create a new innovative tool to assess lifestyle habits, social context, emotional status, and mental skills in adolescents, through an integrated index of the best indicators of well-being in order to improve adolescents wellbeing through a dynamic and personalized interface which provides an immediate automated feedback [9,10,11]. The survey was conducted in May 2021 in Friuli Venezia Giulia, during the partial re-opening of public schools in Italy.

Study population

The study population consisted of a random sample of schoolteachers, employed in public schools. Participants were eligible for inclusion if currently engaged in teaching either remotely or physically at the schools. The enrolled population consisted of 838 school teaching staff, who joined the study voluntarily. The study was carried out in collaboration with the Friuli Venezia Giulia Region and the Western Friuli Health Authority.

In the analyses for the present study, we excluded participants who were missing of informed consent (n=15) and of all item responses (n=28). All procedures performed in the study were in accordance with ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Procedures

Data were collected with AVATAR Web-tool, developed for teachers [12]. A socio-demographic data record was used to collect information on gender, age, housing condition, experience of COVID-19, in family/friends or personally in the last month. The psychological profile was assessed by means of a battery of self-report and standardized psychometric questionnaires. Subjective well-being was assessed with the Psychological General Well-Being Index (PGWBI) [13]. The PGWBI consists of 22 items, rated on a 6-point scale, and grouped into domains: Anxiety, Positive Well-being, Self-control, General Health and

Vitality. The Beck Depression Inventory-II (BDI-II) [14] and the Beck Anxiety Inventory (BAI) [15], were used to assess the severity of depression and anxiety symptoms, respectively. The Ford Insomnia Response to Stress Test (FIRST) was used to measure and identify individuals with sleep reactivity [16], and feelings about the uncontrollability and unpredictability of one's life, in terms of stress perception were quantified with Perceived Stress Scale, PSS [17]. In addition, questions on any COVID-19 infection for oneself or in the family in the last month were introduced.

Statistical Analysis

Statistical data analyses were performed using SPSS (Version 22.0. Armonk, NY: IBM Corp). Data are presented as mean $\pm$ SD or as mean with 95% confidence interval (CI). The Saphiro-Wilk test was used to assess the normality of data distribution. Student's t-test was used to evaluate differences according to gender for continuous variables. The Levene's test was used to assess the equality of variances between groups. A p-value ≤ 0.05 was considered statistically significant.

Results

Socio-demographic characteristics of study population

Demographic characteristics are shown in Table 1. Study population consisted of 838 schoolteachers (126 men, 49.53 $\pm$ 1.25 years old). The higher number of women reflects what was previously reported in Italy in school staff, where women represent about 83% of the entire teaching staff [18].

Of these, 12% contracted COVID-19 in the last month and the 23% had a family member positive to COVID-19.

Table 1

Socio-demographic characteristic across the total cohort

VARIABLES	Total cohort (n=838)
Age (yrs)	49.5±1.2
Male	126 (15%)
Female	712 (85%)
COVID-19 infection in the family	
Yes	196 (23%)
No	642 (77%)
COVID-19 infection	
Yes	97 (12%)
No	741 (88%)
Data are shown as mean±SD or number (%) of subjects	

Quality of life and psychophysical well-being perception

Descriptive data of psychometric questionnaires in the whole cohort divided by sex are presented in Table 2. All variables were normally distributed according to the Saphiro-Wilk normality test.

Regarding sex differences, several variables significantly differed between the two groups. Female teachers overall reported greater depressive symptoms (BDI, $p<0.05$), anxiety levels (BAI, $p<0.001$), and stress reaction via sleep reactivity (FIRST, $p<0.001$), as compared to male counterparts. Considering well-being perception, male teachers reported on average greater general well-being index, both in terms of total score (PWBI, $p<0.001$), general health ($p<0.01$) and vitality ($p<0.001$). No differences between sexes were found in stress perception ($p>0.05$).

Table 2

Psychometric score in the different questionnaires by sex

VARIABLES		Men (n=126)	Women (n=712)	p-value
	BDI	1.30±0.73	1.49±0.88	0.03
	PSS	1.54±0.62	1.65±0.62	n.s.
	BAI	1.61±0.89	1.92±0.97	0.001
	FIRST	1.26±0.44	1.46±0.49	0.001
PGWBI	Anxiety	17.09±5.09	17.63±5.2	n.s.
	Positive well-being	11.55±4.2	10.79±3.9	n.s.
	Self-control	11.46±2.89	10.88±3.09	n.s.
	General health	11.13±2.70	10.47±2.57	0.01
	Vitality	13.18±3.89	11.86±3.94	0.001
	GWBI	2.02±0.84	1.75±0.81	0.001

Data are shown as mean ± SD. Statistical significance was determined by Student's t-test. BDI: Beck Depression Inventory; PSS: Perceived Stress Scale; BAI: Beck Anxiety Inventory; FIRST: Ford Insomnia Response to Stress Test; PGWBI: Psychological General Well-Being Index; GWBI: General Well-Being Index

Effect of COVID-19 infection on psychological profile

COVID infection of a family member in the last month was associated with greater anxiety (BAI, $p<0.05$), reduced perception of self-control (PGWBI, $p<0.05$), general health perception (PGWBI, $p<0.05$) and vitality (PGWBI, $p<0.05$). Conversely, contracting the COVID-19 directly resulted in a decreased perception of his or her health status (PGWBI, $p<0.05$).

Discussion

The present study explores the impact of COVID-19 school closure on schoolteachers' well-being perception in the period from April 2021 to May 2021 during the lockdown when schools were partly or mainly open, demonstrating that COVID-19 pandemic is associated with a reduced psychological profile. More in detail, the main results of this explorative data collection showed that female teachers had a worse well-being perception in terms of health and vitality, and an increase in negative emotional reactivity, addressed as anxiety and stress levels, as compared to male counterparts. In addition, women reported higher levels of depressive symptoms than men. Finally, COVID-19 contagion of a family member in the last month was associated with an increase in anxiety and a reduction in self-control and perception of well-being, while contrary to our expectation, having contracted the virus directly affects only the general health status, but not the psychological dimension.

Within the AVATAR project, the present study aimed at developing a web-tool to assess the schoolteachers' well-being specially to understand the psychological effects of the COVID-19 in a particular group population. It should be emphasized that this group of workers, following the pandemic, had to drastically change their way of working. COVID-19 in fact, represents, a challenge on different fronts, not only health, economic, and social, but also educational. With reference to the Italian context, the government ordered the temporary closure of school, implementing remote teaching systems through synchronous (real-time lessons) and asynchronous lectures (the storage and subsequent dissemination of teaching materials). Although distance learning is characterized by flexibility and ability to customize learning processes, for students and teachers can represents a barrier [19]. If students must be able to self-monitor and modulate his own motivation to learn, the teacher, at the same time, show difficulties in adapting to the new online mode. In particular, as reported by few studies in this field focused on the role of different learning modalities during the pandemic, teachers described difficulty expressing themselves in front of a webcam; their language often lacks flexibility, resulting in a low level of student participation [20,21]. However, teachers have had to define new educational strategies, certainly with a cost on the emotional level and perception of stress. In fact, although most of the data comes from healthcare professionals, describing an expansive range of physical symptoms and psychological distress [22,23,24,25], the pandemic condition with school closure and home confinement has posed great challenges for all actors involved in the educational context. It should be kept in mind that, for teachers, psychological problems related to social isolation are in many cases added to symptoms attributable to burnout, a syndrome characterized by chronic stress in the workplace [26]. As suggested by previous evidence obtained in pre-COVID period, a substantial number of teachers reveals to perceive the workplace as very stressful, due to various reasons, such as excessive workload, lack of resources, low level of support from students and colleagues [27]; moreover, this condition seems to worsen according to age and grade of school they teach. Therefore, our results are in line with what has emerged in other studies and in other Countries [28,29,30,31], which show a psychological profile characterized by poor teachers' mental health, mood fluctuations, and high level of anxiety [32,33,34,35]. According a recent study, teachers' emotional response is considered an important predictor of didactic and perception of self-efficacy [36]. In details, high levels of stress in teachers correlate with a negative or scares use of coping strategies, while teachers with great experience and low perceived stress levels, have higher adaptive emotional, social, and educational skills [37]. This aspect is very important if we consider that the well-being of the students or their psychological distress are directly or indirectly influenced by teachers' well-being [38]. In particular, it is necessary to underline that our data were acquired in the period of continuous opening and closing of schools based on the epidemic trend. Probably, fear of infection and transmission of infection further accentuated the psychological state of the teachers. In fact, our results are in line with a study of Pressley and colleagues showing that teachers who returned to school during pandemic, exhibited high stress levels and anxiety as in burnout [39]. In addition, as in our data, a gender difference in this reactivity was highlighted, reporting the presence of higher levels of stress, anxiety, and depression in female teachers [40]. This predisposition, not only in teacher, but also in women in general, is already known in literature [41,42,43,44].

Another interesting finding of our study, on the psychological level, is the substantial difference between having contracted COVID-19 directly and having a family member positive to COVID-19. Those who contracted the disease do not appear to have psychological effects aside from a significant reduction in good health perception. This could be explained by the fact that once a positive diagnosis has been made, concern is focused solely on one's own health to the detriment of other aspects, in the hope that the symptoms will not worsen. In addition, the continuous invitation to monitor one's condition may have contributed to this. On the other hand, individuals who have seen a family member contract the disease report an alteration in several psychological aspects, with increased anxiety and decreased perception of self-control, health and vitality. A possible explanation of this result is that threat and fear of the disease, which has not yet been contracted directly could increase risk perception. Self-efficacy and therefore the sense of 'being able to' could be lost, with an increased sense of helplessness and consequently a reduction in self-control. A previous paper showed that having been exposed to infection is associated with emotional reactions to the pandemic [45]. In the same way, as in our results, perceived risk of COVID-19 infection was associated with a higher level of perceived stress among school professionals [46].

The study has some limitations. The continuously changing circumstances, due to COVID pandemic trend, did not allow a complete evaluation of all the possible correlated variables potentially affecting psychological profile. In addition, there are some fragility related to the measurements that do not allow to consider all the causal relationships. Furthermore, our study population is not representative of Italian teachers, but it is a monitoring referable to the Friuli Venezia Giulia Region. Finally, some independent variables, such as the grade of school they teach and the level of experience were not required.

Conclusion

The present study showed that the effects of COVID-19 outbreak affect schoolteachers' well-being perception, reporting gender differences in which female teachers are characterized by a reduced psychological profile. Moreover, our results show that the infection of a family member negatively influences mental health much more than having contracted the virus directly. The psychological difficulties that emerged during distance learning underline the need to invest in prevention programs and the promotion of well-being in this professional category, like healthcare professionals, as the school remains the environment that allows teachers to provide structured learning opportunities to students. Given that the WHO considers the school as the setting for health, it is important to create an environment in which, thanks to cooperation and dialogue, each figure actively and synergistically participates in the construction of health and well-being.

Abbreviations

COVID-19: *CO*rona*V*irus Disease 19; BAI: Beck Anxiety Inventory; BDI-II: Beck Depression Inventory_II; FIRST: Ford Insomnia Response to Stress Test; PWBI: Psychological Well-Being Index; SARS: Severe Acute Respiratory Syndrome; AVATAR: A new purpose for promotion and eVALuation of healTh and well-being Among healthy teenageRs; PSS: Perceived Stress Scale; SD: Standard Deviation

Declarations

Author's contributions:

Design of the study, F.M., M.P., and A.P.; process evaluation framework preparation, F.M., M.F.L.L., C.D., G.T., A.C., and I.M.; data analysis, F.M., M.F.L.L., and P.P. All authors critically reviewed the manuscript, contributed to interpretation and approved the submitted version. All authors have read and agreed to the published version of the manuscript.

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Competing interests:

The authors declare no conflict of interest.

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Ethics approval and consent to participate:

The study was approved by the internal ethics committee of each participating School, in accordance with Italian law. In addition, all parents or legal guardians gave informed consent, and authorized researchers to use their data in accordance with Italian law. All procedures performed in the study were in accordance with the ethical standards of the institutional and/ or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Availability of data and materials:

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

Consent for publication:

Not applicable.

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