Schoolteachers' well-being: A pilot study from the AVATAR project during COVID-19 school closure[1]

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Abstract.

BACKGROUND: Teachers are a category at high risk for co-occurring mental diseases.

OBJECTIVES: The purpose was to assess well-being of schoolteachers and psychological effects of coronavirus disease 2019 (COVID-19).

METHODS: Data were collected in April 2021, during the partial re-opening of public schools in Italy, from 838 schoolteachers who complete a battery of psychological tests on a multimedia platform.

RESULTS: In females, school closure increases anxiety (BAI, $p < 0.001$), depression (BDI-II, $p < 0.05$), stress-related insomnia (FIRST, $p < 0.001$), and perceived stress (PSS, $p < 0.05$). In males, on the contrary, rises perceived health ($p < 0.001$) and vitality ($p < 0.001$), also in terms of total score (PWBI $p < 0.05$). In addition, having a family member with COVID in the past month increased anxiety (BAI, $p < 0.05$), reduced perceived physical health (PWBI, $p < 0.05$) and vitality (PWBI, $p < 0.05$).

CONCLUSION: The main results of this pilot study showed that female teachers had a worse well-being perception with respect to men, in terms of health and vitality and an increase in negative emotional reactivity, that impaired when a family member was affected by COVID. The results emphasize the need to invest in prevention and wellness promotion programs in this professional category.

Keywords: COVID-19, teachers, well-being, health, mental disorders

1. Introduction

During the coronavirus disease 2019 (COVID-19) pandemic, the schoolteacher category was at risk for increased mental diseases and burnout, similarly to other professional categories like healthcare professionals. Even under normal conditions, teachers are more prone to mental disorders than other workers [1–3]. In fact, numerous studies reported the high prevalence of stress among teachers [4, 5], often associated with exhaustion and cynicism [6], despite high enthusiasm and job satisfaction [7, 8]. Furthermore, teachers are frequently at risk for musculoskeletal and postural disorders, voice-correlated dysfunctions, psycho-social impairment, known as burnout [9]. In this regard, detailed job demands, especially due to increased responsibilities and deadlines, identify teaching as one of the most stressful

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occupations in terms of chronic workplace stressors. Therefore, prolonged school closures, enforced isolation, and changes in social interactions due to the COVID-19 pandemic have been extremely challenging for teachers, in the joint effort to define new educational strategies to ensure continuity of teaching.

Certainly, the risk of contagion due to social contacts also affected the emotional reactions of teachers and, thus, their quality of life, at least to the same extent that it also affected students, their families and school staff in general [10]. Although several studies conducted during the 2020 lockdown reported teachers' psychological imbalances occurring in Europe and USA, to our knowledge no previous data have been presented on the Italian schoolteacher population, with the special focus on possible gender differences. The aim of the present pilot study was to explore well-being perception among a group of Italian teachers during school closure for COVID-19 emergency.

2. Methods

2.1. Data collection

Data of the present study represent the pilot explorative survey of AVATAR_schoolteachers. AVATAR_schoolteachers is a web platform that is part of AVATAR "A new purpose for promotion and eVAluation of healTh and well- being Among healthy teenageRs" multimedia tool, aimed to create a new innovative instrument for assessing students' lifestyle habits, social context, emotional status, and mental skills, through an integrated index of the best indicators of well-being in order to improve adolescents' well-being through a dynamic and personalized interface which provides an immediate automated feedback [11–13]. This platform for monitoring teachers was created as part of the project, in order to have a more comprehensive view in the school environment. The survey was conducted in May 2021 in Friuli Venezia Giulia, during the partial re-opening of public schools in Italy.

2.2. Study population

The study population consisted of a group of 838 teachers, employed in public schools. Participants

were eligible for inclusion only if they were currently engaged in teaching either remotely or face-to-face at school and they all voluntarily joined the study. Teachers were recruited through announcements and mailing lists using a snowball strategy. A total of 5106 teachers who responded to the announcement received and, thus potentially interested in participating in the study received a personal email containing a general explanation of the protocol; the adherence was 17%.

In the analyses for the present study, we excluded participants who did not have informed consent ($n = 15$) and all responses to the items ($n = 28$). All procedures performed in the study were in accordance with institutional and/or national research committee ethical standards and with the 1964 Declaration of Helsinki and its amendments or comparable ethical standards.

2.3. Procedures

Data were collected with the AVATAR Web-tool, developed for teachers [13]. Socio-demographic information about gender, age, housing condition, and experience of COVID-19, family/friends or personally in the last month was also acquired, through a non-standardized questionnaire.

2.4. Measurements

The psychological profile was assessed by means of a battery of self-reported and standardized psychometric questionnaires.

2.4.1. Well-being perception

Subjective well-being was assessed with the Psychological General Well-Being Index (PGWBI) [14]. 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.

In 2000, the PGWBI was validated in a representative sample of 1,129 Italian citizens aged from 15 years, and its normative values are available [14]. Through a stepwise selection process, six items were identified to predict 90 % variance of the summary measure when the original questionnaire was applied to an Italian population. Item 20 alone reached 60 %, whereas items 7, 21, 5, 6, 18, and 2 added an additional 15 %, 8 %, 3 %, 3 %, and 2 %, respectively. These items were confirmed to become part of the new six-item structure of the questionnaire. The internal consistency measuring the extent to which

the items are interrelated, expressed by the coefficient Cronbach's alpha, was calculated for each study. Example of item "1. How have you been feeling in general during the past month? 0) In excellent spirits, 1) In very good spirits, 2) In good spirits mostly, 3) I have been up and down in spirits a lot, 4) In low spirits mostly, 5) In very low spirits". The scores for all domains are summarized in a global score, which reaches a maximum of 110 points (the best achievable well-being). The results are grouped according with the well-being level in: positive well-being (score > 96) no distress (>73 and <95), moderate distress (>60 and <72), and severe distress (<60). Higher scores indicate greater psychological well-being.

2.4.2. Depression and anxiety

The Beck Depression Inventory-II (BDI-II) [15] and the Beck Anxiety Inventory (BAI) [16] were used to assess the severity of depression and anxiety symptoms, respectively. Both contain 21 questions and each answer is scored on a zero to three-scale. BAI is a widely used 21-item self-report inventory used to assess anxiety levels in adults and adolescents. It has been used in multiple studies, including in treatment-outcome studies for individuals who have experienced traumas. Although the age range for the measure is from 17 to 80, the measure has been used in peer-reviewed studies with younger adolescents aged 12 and older. Example of question "Feeling hot: Not at all, Mildly but it didn't bother me much, Moderately - it wasn't pleasant at times, Severely – it bothered me a lot. The BAI was moderately correlated with the revised Hamilton Anxiety Rating Scale (0.51), and mildly correlated with the Hamilton Depression Rating Scale (0.25) [15].

The BDI-II [15] is one of the most widely used and empirically validated questionnaires for screening depression. Each item is rated on a 4-point Likert-scale ranging from 0 to 3, example of question "Sadness: 0. I do not feel sad, 1. I feel sad much of the time, 2. I am sad all the time, 3. I am so sad or unhappy that I can't stand it". The total score, ranging from 0 to 63, is constructed by adding the item scores, with higher scores reflecting more severe depressive symptomatology. Higher total scores indicate more severe depressive symptoms: i) 0–13: minimal depression; ii) 14–19: mild depression; iii) 20–28: moderate depression; iv) 29–63: severe depression. For BAI, higher total scores indicate more severe anxiety symptoms. The standardized cut-offs are: i) 0–7: minimal; ii) 8–15: mild; iii) 16–25: moderate; iv) 26–63: severe.

2.4.3. Stress levels

The FIRST is a standardized questionnaire that has been shown to be a sensitive measure of vulnerability to sleep disturbance and to have high reliability (test-retest reliability coefficient = 0.92) [17]. The FIRST was used to measure and identify individuals with sleep reactivity (i.e., vulnerability to experience situational insomnia under stressful conditions) [17]. The questionnaire includes 9 items asking about the likelihood of sleep disruption due to specific stressful situations and more broadly described periods of stress occurring during the day or evening and corresponding score included: not likely = 1, somewhat likely = 2, moderately likely = 3, and very likely = 4. Example of question "Do you have difficulty sleeping the day before an important meeting? 1. Never; 2. Sometimes; 3. Often; 4. Very frequently". The total score ranges from 9 to 36. High scores on the FIRST indicate greater vulnerability to sleep disruption.

Instead, feelings of uncontrollability and unpredictability of one's life, in terms of stress perception were quantified with the Perceived Stress Scale (PSS) [18]. PSS is composed by a 10-item, total score is obtained by summing across all items. Example of question "In the last month, how often have you been upset because of something that happened unexpectedly? 0. Never; 1. Almost never; 2. Sometimes; 3. Fairly often; 4. Very often". The internal consistency reliability by Cronbach's alpha and the reasonable acceptability criterion of which is ≥ 0.70. Higher scores indicate higher levels of perceived stress. In addition, questions about COVID-19 infections for participant and/or family members in the last month were introduced.

2.5. Statistical analysis

Statistical data analyses were performed using SPSS version 22.0 (IBM Corp., Armonk, NY, USA). Data are presented as mean ± standard deviation (SD) or as mean with 95% confidence interval (CI). The Shapiro-Wilk test was used to assess the normality of data distribution. Student's unpaired *t*-test for independent samples 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.

3. Results

3.1. Characteristics of study population, quality of life and psychophysical well-being perception

Demographic characteristics are shown in Table 1. The study population consisted of 838 schoolteachers (126 men, 49.53 ± 1.25 years old), 12% of whom have contracted COVID-19 in the last month and the 23% have had a family member positive to COVID-19.

Regarding sex differences, several variables differed significantly between the two groups (Table 2). Female teachers on average reported higher depressive symptoms (BDI, $t = 2.52$, $p < 0.01$), anxiety levels (BAI, $t = 3.23$, $p < 0.001$), stress reaction via sleep reactivity (FIRST, $t = 4.28$, $p < 0.001$), and stress perception (PSS, $t = 2.15$, $p < 0.05$) as compared to their male counterparts. Considering well-being perception, men reported higher general well-being index, both in terms of total score (PWBI, $t = -2.86$, $p < 0.05$), general health ($t = 2.48$, $p < 0.01$) and vitality ($t = 3.29$, $p < 0.001$).

3.2. Effect of COVID-19 infection on psychological profile

Subjects with a COVID-positive family member showed an increased anxiety (BAI, $t = 2.96$, $p < 0.05$), general health perception (PGWBI, $t = 2.74$, $p < 0.05$) and vitality (PGWBI, $t = 2.19$, $p < 0.05$). Conversely, those who contracted COVID-19 directly, exhibited a reduction in the perception one's health status as compare to the non-infected counterpart (PGWBI, $t = -2.10$, $p < 0.05$).

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 $\pm$ SD or number (%) of subjects.

4. Discussion

The present study explores schoolteachers' well-being perception in the period from April 2021 to May 2021, during the lockdown when schools were partly or mainly open, with particular focus on gender differences. In more detail, the main results of this exploratory data collection showed that female teachers, with respect to the normative score, 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, compared to their male counterparts. In addition, women reported higher levels of depressive symptoms with respect to men. The higher number of women in our study population reflects the higher presence of women (83%) in the entire Italian teaching staff [19]. In general, the female gender is more than twice as likely as the male gender to experience anxiety and depressive disorders, and a greater stress reactivity [20]. Moreover, these gender differences persist even when comparing data obtained with normative scores. Generally, female teachers report higher perception of discomfort, moderate level of stress, higher vulnerability to sleep disruption and mild anxiety, whereas their male counterparts even though reporting low values in all the dimensions analysed, they have a better perception of well-being. In summary, COVID-19, represented a challenge on different fronts health, economic, social, and educational. Italian government ordered the temporary closure of school, implementing remote teaching systems through synchronous (real-time lessons) and asynchronous lectures (the conservation and subsequent dissemination of teaching materials). Although distance learning has the advantage of flexibility and customizing learning processes, it can represent a communicative barrier for students and teachers [21]. Whereas students showed a good capability of self-monitoring their scholastic commitment and to modulate their motivation, the teachers showed greater difficulty in adapting to the new online mode. In particular, as reported by a few studies, teachers admitted their embarrassment and confusion in front of the webcam [22, 23]. On the other side, teachers had to define new educational strategies, certainly with a cost on an emotional level and in the perception of stress. Indeed, although most of the data on physical symptoms and psychological distress during the pandemic condition come from healthcare workers [24–27], all actors involved in the educational context also faced major challenges after school closures

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.

and home confinement. Furthermore, the psychological problems of teachers, linked to social isolation, in many cases are added to symptoms of burnout syndrome, associated with stressful conditions caused by the work context (excessive workload, lack of resources, and low level of support from students and colleagues and, perhaps, already present before the pandemic [28, 29]. Therefore, our results although acquired during the pandemic, are in line with findings in other studies and in other Countries [30–33], which show a psychological profile characterized by poor mental health, mood fluctuations, and high level of anxiety in schoolteachers [34–37]. This aspect is a crucial determinant of teachers 'emotional response and is an important predictor of didactic and perception of self-efficacy [38, 39]. At the same time, scientific evidence indicates that the well-being of students is closely influenced by the well-being of teachers [40].

Another interesting finding of our study is the substantial difference between having contracted COVID-19 directly and having a family member who is positive to COVID-19. Those who have 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 health at the detriment of other aspects, in the hope that the symptoms will not worsen. On the other hand, individuals who have seen a family member contracting the disease, report an alteration in several psychological aspects, such as increased anxiety and decreased perception of self-control, health and vitality. One possible explanation for this result is that threat and fear of the disease, which has not yet been contracted directly,

could increase risk perception. Self-efficacy and thus a sense of "make it through" could be lost, with an increased sense of helplessness and, consequently, a reduction of self-control. A previous paper showed that having been exposed to infection is associated with emotional reactions to the pandemic [41]. In the same way, as observed in our study, perceived risk of COVID-19 infection was associated with a higher level of perceived stress among school professionals [42].

The study has some strengths and limitations. Although the sample is unrepresentative, in fact it is referred to as a pilot study, the possibility of assessing the well-being of teachers is very important when one considers the correlation with the degree of student learning. Future studies in this area will help to clarify the nature of this association. An important limitation of this study is that, since no previous measurements have been done, it is not possible to attribute our results to the COVID-19 pandemic. In addition, the constantly changing circumstances due to COVID pandemic trend, did not allow a complete evaluation of all the possible correlated variables, potentially affecting psychological profile. There are also some fragilities related to the measurements that do not allow a fully evaluation of all causal relationships. Furthermore, our study population is not representative of Italian teachers, but it is a monitoring referable to the Friuli Venezia Giulia Region, which, as demonstrated in a recent study, has not been affected by COVID-19 as severely as other Northern Italian Regions [43]. Finally, since the focus of the study was to investigate the possible effects of COVID-19 infection on psychological profile, some variables such as the severity of the contracted disease, possible hospitalization, the presence of other

pre-existing pathologies, and the duration of positivity of a teacher or a family member, were not taken into account.

5. Conclusion

The aim of the present study was to explore teachers' perceptions of well-being during the COVID-19 school closure, reporting gender differences in the dimensions of well-being. Female teachers are characterised by a reduced psychological profile, with higher levels of anxiety, stress and vulnerability. This finding is amplified when compared to the baseline scores of individual psychometric tests. Regarding possible COVID-related effects, our results show that the infection of a family member negatively affects mental health much more than having contracted the virus directly. The psychological difficulties that emerged during the distance learning emphasise the need to invest in prevention and the promotion of well-being in this professional group, on a par with health professionals. Indeed, the school remains the environment that allows teachers to provide structured learning opportunities for students. The World Health Organisation considers schools to be the place of health and considers it important to create an environment in which, through cooperation and dialogue, each figure actively and synergistically participates in building health and well-being.

Ethics statement

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 Declaration of Helsinki and its later amendments or comparable ethical standards.

Conflict of interest

None declared.

Author 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 read and agreed to the published version of the manuscript.

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