O R I G I N A L   P A P E R

The impact of protective psychological factors on teachers in remote teaching activities under stress conditions. A preliminary study

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Abstract

OBJECTIVES: Lockdown due to COVID-19 in Italy resulted in closing schools and Universities during pandemic. Given the impact of lockdown both on teachers and students, this research carried out in Sardinia, Italy aims to: (1) verify (a) the level of stress, depression and anxiety (risk factors); (b) Locus of Control, self-efficacy in teachers; (2) verify the relationship between anxiety, risk factors and teaching satisfaction; (3) evaluate positive and negative aspects of online teaching.
METHODS: Each teacher answered an online questionnaire with 16 closed-ended questions and 4 open-ended ones concerning evaluation of online teaching. Furthermore, to assess protective risk factors, 5 test were administered: Beck Anxiety Inventory; Locus of Control Behavior; General Self-Efficacy Scale; Quick Stress Assessment and Center for Epidemiology; Studies Depression Scale.
RESULTS: (1) Sardinian teachers exhibited low levels of stress, anxiety and depression joint to an internal Locus of Control; (2)Stress is a cross-cutting factor for anxiety and low mood, often co-existing with depression and anxiety. These results are consistent with the hypothesis that teacher's self-efficacy is linked to psychological well-being. Furthermore, internal Locus of Control helped teachers to be confident with online teaching.
CONCLUSION: Self-efficacy and internal Locus of Control play a protective role. Also, while most teachers prefer face-to-face teaching, some of them claim they are competent in the technological field. Last, during pandemic, teachers used the Internet for information for teaching and similar activities.

Introduction

The International Committee in Taxonomy of Viruses on February 11, 2021 officially defined COVID-19 as SARS-COV-2. COVID-19 is a highly infectious epidemic (Li *et al.* 2020; Wang *et al.* 2020a) and in worse cases can cause acute respiratory distress syndrome and death (Torales *et al.* 2020; Wang *et al.* 2020b).

The Governments of several countries in the world took several containment measures to limit the spread of outbreak such as social distancing and lockdown. Italy was strongly affected by COVID-19. The Italian Government declared on January 31, 2021 the state of emergency. So, in the early 2020s, the onset of the COVID-19 pandemic forced most educational institutions to stop the face-to-face teaching and started with distance learning. All schools were closed on March 9, 2021 until the end of the school year (United Nations Educational 2021). A decree of the Prime Minister (DPCM of March 4, 2021) established the closure of schools, confirmed by another decree (DPCM of April 26, 2021; D.L. May 16, 2021 n. 33; DPCM of May 17, 2020). In this period the Italian population had to adopt social distancing and isolation (Cantelmi and Lambiase 2020). Otherwise, all people had to stay at home and online teaching was adopted for education (Cantelmi and Lambiase 2020). In this way it was possible to avoid the spreading of pandemic (Di Giacomo 2020; Remurzi and Remurzi 2020; Urbano and Urbano 2020; Who 2020).

In students, an increasing use of the Internet has been observed during lockdown, leading to a progressive increase in the spread of Problematic Internet Use (PIU). In high school and bachelor levels students it was observed that gender, depression and external locus of control are factors of risk for PIU, while social support, self-efficacy and self-esteem are protective factors (Truzoli *et al.* 2021a; Truzoli *et al.* 2023). Likewise, isolation, uncertainty and fear of the virus affected also mental health (Brooks *et al.* 2020; Casagrande *et al.* 2020; Gualano *et al.* 2020; Li *et al.* 2020; Mazza *et al.* 2020; Ozarmiz–Etxebarria *et al.* 2020; Settineri and Merlo 2020a; Settineri and Merlo 2020b; Gori *et al.* 2021; Passavanti *et al.* 2021; Salari *et al.* 2020). In fact, many persons reported psychological symptoms such as: anxiety, depression, insomnia, post-traumatic stress disorder and anger (Ammar *et al.* 2020; Chatterjee and Chauhan 2020; Li *et al.* 2020; Liu *et al.* 2020; Lurn *et al.* 2020; Mazza *et al.* 2020; Röhr *et al.* 2020; Rossi *et al.* 2020; Shigemura *et al.* 2020; Somma *et al.* 2020; Sood 2020; Torales *et al.* 2020; Vismara *et al.* 2021). Furthermore, people with a family member infected showed anxiety (Mazza *et al.* 2020). Generally, the profession of teacher is one of the most stressful professions (Johnson *et al.* 2005) due to excessive institutional duties, sometimes strained relationships with colleagues, relationships with parents of students and school teaching. During the COVID-19 pandemic new stressors were added such as pandemic itself (for their health), online teaching and managing relationships with their students.

In this viewpoint, investigating job satisfaction becomes crucial because online teaching could cause dissatisfaction in most teacher with a reduction of motivational resource (Zhang *et al.* 2020). Likewise, teaching dissatisfaction can be linked to some variables such as: personality, behaviour, motivation, organizational variables that may affect teachers and job experience (Viotti *et al.* 2020).

This study aims to identify the protective factors and personality factors associated with satisfaction of teaching during COVID-19 pandemic. We assume that self-efficacy, Locus of Control, and coping could be protective factors that would counterbalance distress such as depression, anxiety, and stress (Truzoli *et al.* 2023). Specifically, self-efficacy represents people's belief about their possibility to execute actions adequate on environmental demands (Bandura 1986); indeed, teacher self-efficacy has been correlated with job satisfaction and psychological well-being (Caprara *et al.* 2003; 2006) and may be conceived as a multifactorial construct, that includes gender, years of teaching experience, instruction, adapting education to individual students' needs, motivating students, keeping discipline, cooperating with colleagues and parents, and coping with changes and challenges (Perera *et al.* 2019; Skaalvik & Skaalvik 2007).

As regards Locus of Control, Rotter (1966) differentiates between internal and external Locus of Control. The former is an ability to report to him/her the success or the failure of a due action. In contrast, External Locus of Control addresses the success or failure to an external cause (e.g., fate, karma, luck etc.). Internal Locus of Control implies the self-attribution of either the success or the failure of a due action and may be considered as a personal resource that enhances work engagement, in addition to positive self-evaluations (Betoret 2013). Teachers' job satisfaction (Bein *et al.* 1990; Sumbul 2003) and well-being (Betoret 2013) are linked to an internal Locus of Control that in turn is related with the achievements of students (Lerner *et al.* 2003).

Last, coping skills are mental and behavioural strategies that help people to develop resilience in adverse situations and are associated with wellbeing. Chan and Hui (1995) demonstrated that avoidant coping was significantly associated with high levels of emotional exhaustion, depersonalization low personal achievement, but also lower engagement and higher burnout levels (Parker *et al.* 2012), whereas seeking support, positive appraisal, and plainful problem solving emerged as positive coping strategies. More recently, anger management showed to be an additional relevant coping strategy (Austin *et al.* 2005).

Since COVID-19 pandemic is a very stressful period for teaching, this study aims to verify:

(1) the level of stress, depression and anxiety (risk factors) in teachers;
(2) the levels of self-efficacy and the type of Locus of Control, and of coping strategy in teachers;
(3) the relationship between anxiety, risk factors and teaching satisfaction.

Finally, this study aims to evaluate positive and negative aspects of online teaching as reported by the teachers themselves.

Material and methods

Participants
Forty-three school teachers from Sardinia took part in the survey (mean age = 51.01, SD = 7.7); 4 males and 39 females. In relation to the school teachers were distributed as follows: 4 from high school, 9 from junior school, 21 from primary school and 9 from infant school. The tests and informed consent were administered online anonymously.

Procedures
The school principals advertised the recruitment to this research possibility with an announce on their websites in the "communications" section or where asked to participate though an e-mail sent by their principals. Teachers were informed of their right to withdraw from the study at any time, and were also informed about the steps being taken ensure their privacy. Before answering the questionnaire, all participants received adequate information about the aim of the study and data processing. In addition, all participants provided the informed consent for the sensitive data processing, the participation in the survey, and the use of the data. All questionnaires were anonymous. Both questionnaire and tests were administered online.

After a short introduction in which the participants were informed on the context of the questionnaire and the importance of answering each item of the questionnaire and the tests, the trial started. The participants could take as long as they wished to complete each questionnaire, but on average, the entire process typically took 40 minutes per participant.

This study is compliant to 1995 Declaration of Helsinki (as revised in Edinburgh 2000).

Materials
Each subject was asked to answer to an online questionnaire. First of all, age gender and school of teaching were recorded in a socio-demographic section. Afterwards, the subjects were required to answer to 16 closed-ended questions and 4 open-ended ones.

Furthermore, 2 questions dealt with the Internet general use during lockdown. The 16 questions regarded: support received by the school satisfaction of online teaching, teacher's skill, student's motivation for online teaching, communications, coping skills during online teaching.

The last section investigated the exposure (direct or indirect) to the virus and if he/she lost a beloved due to COVID-19 or there was a COVID-19 infected in their own house.

To assess protective risk factor, 5 tests were administered:
1) Beck Anxiety Inventory (BAI) (Beck *et al.* 1988) is a self-administered test of 21 items. This test aims to assess anxiety symptoms. The answers (0–3 ranged) of each item were summed in a total score (0 to 63) (Beck and Steer, 1993). Reliability was measured by Crombach's α = 0.92 and test-rated reliability (1 week = 0.75) (Beck *et al.* 1988). The clinical cut-off is ≥16. For this research the Italian version (Sica and Ghisi 2007) was used.
2) Locus of Control Behavior (LCB) (Craig *et al.* 1984) is a self-administered test of 17 items and tests the individual locus of control about beliefs of persons about behavior events. The answers (ranged 0–5 point) of each item were summed in a total score (0 to 85). The higher the score, the more external the locus of control. For this research the Italian version (Farma and Cortinovis 2000) was used.
3) General Self-Efficacy Scale (GSE) (Schwarzer and Jerusalem 1993) is a self-administered test of 10 items and investigates the individual belief in the own ability to cope with new or difficult situations. The answers (1–4 rating scale) of each item were summed in a total score (ranging from 10 to 40). Crombach's α values ranged from 0.82 to 0.93 (Schwarzer 1993; Schwarzer and Jerusalem 1995). For this research the Italian version (Sibilia *et al.* 1995) was used.
4) Quick Stress Assessment (QSA) (Tarsitani and Biondi 1999) is a self-administered test of 15 items and evaluates four psychopathological aspects such as: anxiety, depression, somatization and aggression and allows assessing the perceived social support. The answers (0–3) of each item were summed in a total score (ranging from 0 to 45). The test-retest reliability was r = 0.84 (Tarsitani and Biondi 1999).
5) Center for Epidemiology: studies depression scale (CES-D, Radioff 1977) is a self-administered test of 20 items and assesses some dimensions of depression: depressed mood, feelings of guilt, worthlessness, feelings of helplessness and despair, psychomotor retardation, loss of appetite and sleep disorders. Crombach's α ranged from 0.85 to 0.90 (Radioff 1977). Clinical cut-off was ≥16. For this research and Italian version (Balsamo and Saggino 2007) was used.

Data analysis
The percentages per response class, as well as means and standard deviations of the used scales, were calculated. Spearman's r for correlations between variables

was calculated. Once it was verified that the statistical assumptions were satisfied, ANCOVA was used to identify the explanatory variables of satisfaction levels for online teaching.

Furthermore, for the answers to the questionnaire, the percentages per response class were calculated.

Results

In Table 1 frequencies and answer percentages to the questionnaire are shown.

Some comments on the results are presented below by including the questions in some thematic areas

Tab. 1. Questionnaire: frequencies and answer percentages.

Do you prefer teaching online or in class?

I don't know	1 (2.3%)
The same	1 (2.3%)
In the classroom	40 (93%)

Do you think you are technologically competent enough to face online teaching?

Yes	14 (32.6%)
Quite	18 (41.9%)
A little	11 (25.6%)
No	0 (0%)

What was your feeling like about online teaching?

Very positive	0 (0%)
Positive	14 (32.6%)
Neither positive nor negative	18 (41.9%)
Negative	11 (25.6%)
Very negative	0 (0%)

Do you think the school has provided you with clear information on the procedures to follow for online teaching?

A lot	5 (11.6%)
Quite	23 (53.5%)
A little	10 (23.3%)
At all	5 (11.6%)

Concerning online teaching, do you think you know what to do?

Yes, absolutely	9 (20.9%)
Yes, but I have doubts	25 (58.1%)
No, I have many doubts	9 (20.9%)
No, not at all	0 (0%)

With online teaching, do you feel that you have successfully taught new contents?

Yes	3 (7%)
Quite	20 (46.5%)
A little	19 (44.2%)
No	1 (2.3%)

Do you think you succeed in complying with the student's requests for explanation during online teaching?

Yes	7 (16.3%)
Quite	20 (46.5%)
A little	14 (32.6%)
No	2 (4.7%)

Do you think that the new criteria for evaluating the student's performance under the current circumstances are satisfactory?

Yes	2 (4.7%)
Quite	7 (16.3%)
A little	24 (55.8%)
No	7 (16.3%)
Other	3 (7%)

How do you assess online communication with your students?

Very good	3 (7%)
Satisfactory but can be improved	29 (67.4%)
Unsatisfactory	11 (25.6%)
Very unsatisfactory	0 (0%)

Do you think the students' motivation is satisfactory?

Yes	6 (14%)
Quite	19 (44.2%)
A little	17 (39.5%)
No	1 (2.3%)

Do you think that the transition from traditional teaching to online teaching has affected your mood?

A lot	8 (18.6%)
Quite	9 (20.9%)
A little, I manage to handle the situation	24 (55.8%)
No, no change was remarked	2 (4.7%)

Would you recommend to use online teaching at school when the COVID-19 emergency is over?

Yes	9 (20.9%)
Yes, but for supplementary activities only	18 (41.9%)
Yes, but for some subjects only	7 (16.3%)
No	9 (20.9%)

Concerning online teaching, what is the main difficulty that you are facing?

Internet connection	3 (7%)
Lesson recording	1 (2.3%)
Student evaluation	12 (27.9%)
Interaction	16 (37.2%)
No guidelines	5 (11.6%)
Nothing	4 (9.3%)
Other	2 (4.7%)

What do you usually do when you feel under stress due to online teaching?

I plan teaching	13 (30.2%)
I compare my experience	21 (48.8%)
I trust in partner/friends	4 (9.3%)
I find some alternative to relax	3 (7%)
I try not to think about it	0 (0%)
I never feel under stress	2 (4.7%)

What statement better shows your experience with online teaching?

I feel good	1 (2.3%)
I teach with greater difficulty	25 (58.1%)
I can teach, sometimes with difficulty	5 (11.6%)
I feel uneasy	12 (27.9%)
I teach less effectively	0 (0%)

1. Support by the school:
- Do you think you have received clear information on the procedures to be followed for online teaching from the school?

65.1% of the sample answered "A lot" or "Quite"

2. Satisfaction with online teaching:
- As a teaching method, do you prefer online or classroom teaching?

The vast majority (93%) prefer in the classroom.
- What impression did you have about online teaching?

32.6% of the sample has had a positive impression, while 41.9% has had neither a positive nor a negative impression.

In general, how happy are you with online teaching?

A lot	1 (2.3%)
Quite	25 (58.1%)
A little	15 (34.9%)
Not at all	2 (4.7%)

For what main reason did you choose to answer like this?

Answer	A	B	C	D	E	F	G	H
A lot	1 (100%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Quite	6 (24%)	9 (36%)	5 (20%)	2 (8%)	1 (4%)	0 (0%)	0 (0%)	2 (8%)
A little	0 (0%)	0 (0%)	9 (60%)	3 (20%)	2 (13.3%)	0 (0%)	0 (0%)	1 (6.7%)
No at all	0 (0%)	0 (0%)	2 (100%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)

A - Acquisition of new skills
B - Maintaining relationship with students and learning
C - Direct interaction missing
D - Doubts on learning efficacy
E - Skills missing/technical difficulties
F - Guidelines missing
G - Work organization
H - Not specified

What did you like most about online teaching?

A	B	C	D	E
24 (55.8%)	12 (27.9%)	0 (0%)	3 (7%)	4 (9.3%)

A - Acquisition of new skills
B - Maintaining relationship with students and learnings
C - Work organization
D - Presence and involvement of students
E - Not specified

What did you like least about online teaching?

A	B	C	D	E	F	G	H	I
1 (2.3%)	1 (2.3%)	19 (44.2%)	9 (20.9%)	1 (2.3%)	8 (18.6%)	1 (2.3%)	1 (2.3%)	2 (4.7%)

A - Evaluation mode
B - Guidelines missing
C - Feedback with students missing/direct interaction
D - Technical difficulties
E - Poor experience
F - Engagement of children/students with difficulty
G - Lower efficacy of teaching
H - Parental interference
I - Not specified

Are using the Internet for other purposes as well during this period?

Search for information	16 (37.2%)
Study	20 (46.5%)
Online games	1 (2.3%)
Online gambling games	0 (0.0%)
Leisure	0 (0.0%)
Pornography	4 (9.3%)
No	0 (0.0%)
Other	2 (4.7%)

- Do you think the new student evaluation criteria, developed for the current circumstances, are adequate?

A little more than 50% of the sample answers "A little".

- Would you recommend to use online teaching at school more when the COVID-19 emergency is over?

About 42% says "Yes", but for supplementary activities only.

- In general, haw happy are you with online teaching?

About 40% of the sample is a little or at not at all happy. About 58% is quite happy.

- What did you like most about online teaching?

For most:. acquiring new skills and maintaining learning and the relationships with students.

- What did you like least of online teaching?

For just under half of the sample: direct interaction missing (42%).

3. Skills of teachers:

- Do you think that you have enough technological skills to support online teaching?

42% of the sample answers "Enough".

- Referring to online teaching, d you think that you know well what to do?

About 58% of the sample has doubts.

- Do you think that you have successfully taught new content online?

Almost 46.5% says "Enough", but 46,5% says "A little" or "No".

- Concerning online teaching, what is the main difficulty you are facing?

Most of the sample has reported "Interaction with students", followed by "Student evaluation".

- What statement could better express your experience with online teaching?

Despite some difficulties, 58.1% of the sample is acquiring new skills.

4. Student motivation:

- Do you think student motivation is adequate?

According to 41.8% of the sample it is "A little" or "Not at all" adequate.

5. Communication during online teaching:

- How do you assess communication with your students during online teaching?

According to about 75% of the sample is adequate but needs to be improved; according to 25.6% it is inadequate.

- Do you manage to fulfill the explanation requests by your students during online teaching?

A little less than 50% of the sample says "Enough", but 37.3% says "A little" or "No".

6. Impact of online teaching on people:

- Do you think that moving to face-to-face teaching to online teaching has influenced your mood?

About 56% of the sample were a little affected, but nearly 21% are struggling to handle.

- What do you usually do when you feel stressed by online teaching?

Most of the sample talks to colleagues or plan teaching activities better.

7. Use of the Internet:

- During these days are you using the Internet also for other purposes?

In general, they search for information and update themselves with study or training activities.

- During these days, how much are you using the Internet for purposes other than online teaching?

The majority: from 1 to 3 hours, but nearly 21% from 4 to 7 hours.

The reliability of the questionnaire was Crombach's α = 0.79 (Guttman = 0.85). As for validity, Kaiser-Meyer-Olkin Test (KMO = 0.80) and Bartelett Test of Sphericity ($p < 0.0001$).

From the analysis of the questionnaire it was observed that most of the interviewees declared they prefer face-to-face teaching, in the classroom, even though they believe they are quite competent in the technological field (41.9%), though declaring that they have doubts about what to actually do (58.1%). In particular, 16.3% of respondents revealed concerns about the effectiveness of online teaching and its application, especially when aimed at students with learning difficulties (18.6%). However there was little difference between teachers who believed to be able to adequately expose new contents (46.5%) and those who believed to have been very successful in teaching new concepts (44.2%).

Further, 60.4% of teachers declared that were satisfied with online teaching; 39.6% underlined difficulties due to student's evaluation and no interaction during lessons. Online teaching was appreciated for learning new skills.

Moreover, there was a slight discrepancy between those who believe to have satisfied the students' requests in forced lockdown condition (47.3%) and those who believe to have done so, but in a less satisfactory way (32.6%).

Most teachers believe that the new evaluation criteria, formulated under a pandemic circumstance, were not very adequate (55.8%).

Also 67.4% judges distance communication with their students to have been adequate, but can be improved, evaluating the students' motivation to be adequate (44.2%).

Frequencies and percentage of answers to items on COVID-19 are shown in Table 2.

In the context closely related to Covid-19, the percentage of those who have not contracted the virus is prevalent (72.1%) and did not lose a beloved one due to the pandemic flu (93%), without even having had infections in the family (97.7%).

Table 3 shows Means and Standard Deviations (SD) of questionnaires.

Tab. 2. Frequencies and percentage of answers to items on COVID-19

Have you been exposed to COVID-19?	N°	%
Directly	1	2.3
Indirectly	2	4.7
I don't think I was exposed	27	62.8
I don't know	13	30.2
Did you get the virus?	**N°**	**%**
Yes	0	0
No	31	72.1
I don't know	12	27.9
Have you lost a Beloved One due to the virus?	**N°**	**%**
Yes	3	7
No	40	93
Were there any infections from COVID 19 among your family members?	**N°**	**%**
Yes	1	2.3
No	42	97.7

Legend:
Directly means that you have had a direct contact with a COVID 19 positive person.
Indirectly means that you have had a contact with a someone having had contacts with a COVID 19 positive person.

CES-D highlights a low depression in the examined sample, whereas BAI highlights a low anxiety. LCB score is 1 SD over the mean (standardized by Kumbhar and Gupta 2016). Since URS scores are normal (standardized measures by Tarsitani and Biondi 1999), the sample as a whole does not show any acute stress. Moreover, GSE scores are normal (standardized measures by School *et al.* 2002).

In Table 4 the results of correlation analysis have been reported. Per each letter, correlation values and p-values are shown in the upper and lower lines, respectively.

General satisfaction with online teaching correlates negatively with the external locus of control ($r = -0.42$; $p < 0.001$), thus expressing a good capacity for internal control and proving a good trust in one's own abilities when facing a completely new situation.

Furthermore, external locus of control correlates negatively with self-efficacy ($r = -0.53$; $p < 0.001$) and positively with stress ($r = 0.79$; $p < 0.001$), and depression ($r = -0.82$; $p < 0.001$). Stress correlates negatively with self-efficacy ($r = -056$; $p < 0.001$) and positively with anxiety ($r = 0.79$; $p < 0.001$); depression ($r = 0.85$; $p < 0.001$). Lastly, depression correlates negatively with self-efficacy ($r = -0.47$; $p < 0.001$) and positively with anxiety ($r = 0.82$; $p < 0.001$) and stress ($r = 0.85$; $p < 0.001$). Stress is a cross-cutting factor for anxiety and anxiety and depression are co-present).

According to ANCOVA analysis, with the following results: $F_{1,41} = 10.41$; $p < 0.01$; $R2 = 0.18$, LCB is the best predictor for satisfaction with online teaching.

Discussion

This study was developed during a COVID-19 pandemic and social distancing as a way to contain the spread of virus caused an increase of anxiety and depression (Casagrande *et al.* 2020; Passavanti *et al.* 2021; Rossi *et al.* 2021; Petito *et al.* 2022). The consequence of COVID -19 pandemic affected many fields: financial (Duan and Zhu 2020); healthcare (Brooks *et al.* 2020; Lai *et al.* 2020; Phelan 2020; Settineri and Merlo 2020b): and they affected the population for a long time, even once the emergency is over (Duan and Zhu 2020). The research aimed to verify:

(1) the level of stress, depression and anxiety (risk factors) in teachers;
(2) the levels of self-efficacy and the type of Locus of Control, and of coping strategy in teachers;
(3) the relationship between anxiety, risk factors and teaching satisfaction.

In relation to the first hypothesis: the lower values of anxiety, depression and internal locus of control show that Sardinian teachers have high values of self-

Tab. 3. Mean and Standard Deviation (SD) of questionnaires

Scale	Mean (SD)
LCB (locus of control)	21.9 (9.4)
GSE (self-efficacy)	30.6 (4.5)
BAI (anxiety)	11.3 (10.7)
VRS (stress)	15.1 (8.6)
CES-D (depression)	15.2 (11.6)

Tab. 4. Spearman's correlations between the scales used and satisfaction with online teaching

	A	B	C	D	E	F
A	1	**-0.42**	0.16	-0.07	-0.07	0.019
A	--	0.005	0.30	0.66	0.70	0.90
B		1	**-0.56**	**0.58**	**0.61**	**0.62**
B		--	<0.0001	<0.0001	<0.0001	<0.0001
C			1	**-0.53**	**-0.48**	**-0.56**
C			--	<0.0001	0.001	<0.0001
D				1	**0.82**	**0.79**
D				--	<0.0001	<0.0001
E					1	**0.85**
E					--	<0.0001
F						1
F						--

Legend:
A Satisfaction; **B** LoC; **C** GSE; **D** BAI; **E** CES-D; **F** VRS. Significant correlations have been highlighted in bold.

efficacy and self-control when compared to the normality values reported in the single tests.

Regarding the protective factors Locus of Control and Self-Efficacy and the Sardinian sample show values of average within the normative value. Most teachers show an internal Locus of Control and Self-Efficacy. Coping strategies are adequate and teachers declare to receive support from their colleagues (Betoret 2013). In line with previous research that indicate the use of adequate coping strategies as a predictor of teachers' well-being (Parker *et al.* 2012), our research showed that good self-efficacy and internal Locus of Control is related to well-being (Drnovšek *et al.* 2010; Breland *et al.* 2020). Thus, these protective factors could play an important role in reducing the negative consequences on mood and psychological aspects due to COVID-19 pandemic.

The second hypothesis aimed at identifying the correlations between depression, anxiety, stress and protective factors in relation to online teaching satisfaction. Other researches show that stress is a cross-cutting factor for co-existing anxiety and depression (Truzoli *et al.* 2023). Furthermore, teacher's self-efficacy is linked to psychological well-being (Zee and Koomen 2016).

Thus, results show that during COVID-19 pandemic, the school environment was virtual and internal Locus of Control helped teachers to be confident with it. Therefore, Self-Efficacy and internal Locus of Control played a function of protective factor in stress situations like pandemic (Truzoli *et al.* 2021b). Otherwise, stress and depression are important predictors of dissatisfaction of online teaching.

Last, as regards positive and negative aspects towards online teaching, some are negative and other positive. Most of the sample declared they prefer face-to-face teaching in classroom, some of them believe they are competent in the technological field. This is consistent with the situation: the lack of direct interaction with students is the least appreciated element about online teaching, that is the teachers did not lose their relationship with their students, even if in a technological-mediated mode. During pandemic, teachers used Internet for other purposes like search for information for teaching or other. It is likely that internal Locus of Control and self-efficacy are very important protective factors for teachers and they are very useful to improve general satisfaction and personal resilience. From a psychological point of view, teachers seem to develop a strategy of coping. In general, teachers need support for online teaching, since it was a new difficult situation. Support from colleagues helps them to become able to manage a new kind of teaching.

Conclusion

The research was carried out during COVID – 19 lockdown when all Italian population was invited to stay at home in order to mantein social distance and isola-

tion to avoid the spread of pandemic (Cantelmi and Lambiase 2020).

This environmental condition had a negative effect on mental health (Brooks *et al.* 2020; Casagrande *et al.* 2020; Li *et al.* 2020; Mazza *et al.* 2020; Ozamiz-Etxeborria *et al.* 2020; Settineri and Merlo 2020a; Settineri and Merlo 2020b; Gori *et al.* 2021; Passavanti *et al.* 2021; Wang *et al.* 2020a; Wang *et al.* 2020b) with symptoms such as: anxiety, depression, insomnia, post- traumatic stress disorder, cybercondria and fear (Ammar *et al.* 2020; Chatterjee and Chaunan 2020; Li *et al.* 2020; Liu *et al.* 2020; Lurn *et al.* 2020; Mazza *et al.* 2020; Röhr *et al.* 2020; Rossi *et al.* 2020; Shigemura *et al.* 2020; Somma *et al.* 2020; Sood 2020; Torrales *et al.* 2020; Vismara *et al.* 2021).

Results of present research showed that Sardinia teachers exhibited lower levels of anxiety, depression and internal locu of control, high values of Self-Efficacy and Self–Control when compared to the normality reported in each test.

These results obtained among the teachers interviewed in Sardinia highly differs from that found in Lombardy (Truzoli *et al.* 2021b) where depression turns out to be the main predictor of low satisfaction. This difference seems to be attributed to the different regional impact of the Covid-19 pandemic in 2020. In fact, in Lombardy the Covid-19 cases have been far more numerous than in Sardinia, with higher numbers of death cases related to it. It certainly had a negative impact on the management of daily activities, later affecting the mood of people. Some teachers declared to be stressed by: uncertainty of having been infected by COVID-19 (27.9%); having lost a beloved one (7.0%); having some people in family with COVID-19 (2.3%) (Truzoli *et al.* 2021b).

Thus, most Sardinian teachers showed an internal Locus of Control and high Self–Efficacy. These characteristics could help they to be confident with a new kind of teaching and school environment totally virtual, and these personality aspects play a function of protective factors in stress situations (Tangney *et al.* 2004; Truzoli *et al.* 2021b; Truzoli *et al.* 2023).

This research shows some limitation. First of all, the sample is made up of volunteers. This produced some bias. As an example, those who accepted to participate could be the more motivated persons and with self and teaching satisfaction. Moreover, the sample is small and this may limit generalization. In addition, our analyses do not allow to infer causal effect but only correlational one. Further correlational studies may enrich the knowledge about the interconnection and mediation and modulation impact of the intervening variables.

In conclusion, our study encourages to plan efficient interventions to support teacher stress, coping, and competence. In particular, interventions should be addressed to the teachers most in need and based on targeted needs.

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