Coping strategies at the frontline of care: Comparisons between Covid-19 and non-Covid-19 units' nurses and the role of moderator variables

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Abstract

Introduction: Relatively few studies focused on the coping strategies adopted by the healthcare workers during the second phase of the pandemic. The present study compared the coping strategies between Italian nurses working in Covid-19 and in other units and it explored whether socio-demographic and work-related variables moderate the relation between the type of unit and coping strategies.

Methods: A web-based questionnaire that included sociodemographic and work-related questions and the Coping Orientation to Problem Experienced—New Italian Version-25 item was administered. Moderation effects between variables and coping strategies were analyzed using generalized linear models.

Results: 253 nurses participated. Nurses who worked in a Covid-19 unit had significantly lower scores on Avoidance Strategies subscale and higher scores on Positive Attitude and Social Support subscales than nurses working in other units.

Discussion: Gender differences emerged only on the social support coping dimension, with women being more likely to adopt social support than men. No association between the type of unit and the other coping strategies was found.

Conclusion: Nurses working in Covid-19 units showed better coping strategies than their colleagues: this suggests that support interventions aimed to promote coping strategies should be offered also to Covid-19-free units’ nurses.

KEYWORDS
adaptation, adaptive behavior, coping, Covid-19, nurses, psychological

1 INTRODUCTION

1.1 Covid-19 units: The frontline of care against the pandemic

On March 11, 2020, the Covid-19 epidemic which began in November 2019 was declared a global pandemic by the World Health Organization. In Italy, the first severely hit European country, the spread of the virus became so overwhelming for the healthcare services of the Northern regions that it spread very quickly throughout all the country. According to previous studies, during the outbreaks of severe acute respiratory syndrome (SARS) and Middle Eastern respiratory syndrome (MERS), frontline healthcare professionals reported high levels of stress. Similarly, some reviews including meta-analyses showed that during the first wave of the Covid-19 pandemic very high percentages of healthcare workers at...
the frontline of care reported severe depressive and anxious symptoms, insomnia, posttraumatic stress symptoms, and work-related stress. An additional emotional burden experienced by healthcare workers was the fear of introducing the virus into their own homes and exposing family members to Covid-19.12–14 Covid-19 units represent the front-line of care against the virus, a very distressing and exhausting healthcare environment, where working with Covid-19 patients involves long hours and prolonged, continuous contact with critically ill and dying patients; a strong sense of responsibility is required.15,16

1.2 | Coping: A buffer against stressful situations

According to Lazarus,17 mental health is not only direct function of the level of stress, but also it depends on how people appraise and face critical situations. Coping may be defined as a process implying the use of a series of skills and strategies to face stressful situations.18–22 In the literature on coping, several theoretical models have been proposed. One of the most empirically supported is the model introduced by Carver et al.23 who identified 15 coping strategies and made several distinctions within the overall categories of problem-focused and emotional-focused coping (e.g., active coping, planning, restraint coping, seeking social support for emotional reasons, focus on and venting emotions, positive reinterpretation, and acceptance), each one measured by a scale of the Coping Orientations to Problems Experienced (COPE).23 Subsequently, in an Italian sample, Sica et al.24 revised the COPE and identified five independent coping strategies including Social Support (e.g., the tendency to get advice from other people about what to do to cope with a stressor), Avoidance Strategies (e.g., the tendency to avoid thinking of and/or to refuse to believe that something negative has happened), Positive Attitude (e.g., the tendency to look for something good in what is happening), Problem Solving (e.g., the tendency to focus on dealing with a problem) and Turning to Religion (e.g., the tendency to use prayer as a resource to deal with the negative emotions related to an event). This structure has been further confirmed by Foà and colleagues.25 Literature studies that examined the correlations between the COPE-NVI dimensions and psychological well-being or distress measures in samples of the general population or healthcare workers consistently showed that avoidance strategies and positive attitudes represent respectively dysfunctional and functional strategies, while turning to religion seems to be neither functional nor dysfunctional.25–30 Problem solving has been generally found to be a functional strategy24,27–30 even if not all the studies did support this outcome27; social support seeking has been generally found to be a dysfunctional strategy, since it correlated positively with psychological distress outcomes in most of the available studies (i.e., four out of six studies).24,26,28–30

A classification of the coping strategies according to the direction of the correlations with psychological well-being or distress outcomes in the studies24,26–30 which used the COPE-NVI is presented in Table 1.

| TABLE 1 | COPE-NVI functional and dysfunctional coping strategies according to the correlations with psychological well-being or distress outcomes |
|---------|--------------------------------------------------------------------------------|
| Avoidance strategies | Correlations with psychological distress outcomes in the general population (Sica et al.) | Positive |
| Turning to religion | Correlations with psychological distress outcomes in the general population (Sica et al.) | Absent |
| Positive attitudes | Correlations with psychological distress outcomes in the general population (Sica et al.) | Negative |
| Social support seeking | Correlations with psychological distress outcomes in the general population (Sica et al.) | Positive |
| Problem solving | Correlations with psychological distress outcomes in the general population (Sica et al.) | Absent |

Note: COPE-NVI = Coping Orientations to Problems Experienced Nuova Versione Italiana.
1.3 | Nurses' coping strategies during the pandemic

Nurses with dysfunctional coping skills including avoidance strategies, are more likely to report psychopathological responses when facing stressors. In fact, it is well-established that if the coping response to the situation is functional including a positive attitude and problem-solving, it can mitigate the stressful impact of the event; however, if the response is dysfunctional, it can even amplify the impact of the stressor amongst healthcare workers, as shown in the previous epidemics and generally by literature data on stressful events.

Literature on coping in nurses showed that it may be associated with specific socio-demographic and work-related variables. In nurses, coping strategies may be different across gender; women would be more likely to use social support than men. According to Folkman et al., coping strategies may be more functional (i.e., more positive attitudes, orientation to problems) amongst people with older age as a function of developmental processes. This hypothesis has been supported by some studies conducted both in the general population during other epidemics and in nurses, but it has not been confirmed by other studies.

In nurses, working age may be a variable associated with more positive coping strategies including positive attitudes and problem solving. Studies carried out during the first wave of the Covid-19 pandemic in the Italian context support this statement. According to Babore et al., in healthcare professionals coping strategies based upon positive attitudes, measured through the Coping Orientation to Problem Experienced-New Italian Version (COPE-NVI), were one of the major protective factors against anxiety, while coping based on avoidance strategies and social support seeking were vulnerability factors. Similar conclusions were found in other contexts by the survey of Cai et al. conducted between January and March 2020 in China. The results showed that nurses used strategies based on problem orientation and positive attitudes, while showing low search for social support and moderate avoidance. In the United States, Shechter et al. found that coping based on positive attitudes was adopted by half of their sample, together with the search for social support and turning to religious practices.

1.4 | Rationale and aim

Relatively few studies focused on the coping strategies adopted by the nurses during the second phase of the pandemic when their responses to the virus spread may have changed over time due to the vaccination plan. In addition, no study explored potential differences between the coping strategies of nurses working in Covid-19 units, the frontline of care against Covid-19, and those working in other units.

A distinction between the two types of units is relevant since a greater workload of nurses is assigned to the Covid-19 units as compared to the workload assigned to non-Covid-19 settings. In Italy, in Covid-19 units, there has been a very high number of COVID-19 accesses, while in non-Covid-19 areas accesses of patients were reduced. In Covid-19 units, several aspects such as the constant contact with patients suffering from respiratory difficulties of viral origin, the respect of the rules of asepsis and infection prevention, and the use of complex protection devices have created a higher level of workload and stress than other units.

Studies on healthcare personnel, at the forefront of the pandemic, have shown a high prevalence of high levels of burnout and psychopathological symptoms such as depression, anxiety, stress with significant percentages above 30% of the sample examined and risk of negative psychological consequences with high levels of both depressive and posttraumatic symptoms. Data on Italian personnel indicated a higher overall burden of psychological symptoms in Italian workers than those found in the early Chinese studies, but a similar incidence when compared with later studies.

Therefore, the present study compared the coping strategies between Italian nurses working in Covid-19 units and nurses working in other units. A further aim was to explore whether the association between the type of unit (Covid-19 units vs. other units) and coping strategies might be moderated by a series of variables previously found to be related to coping, including socio-demographic (gender, age, and living with other people in the same home) and work-related variables (working age as a nurse, general nursing workload, number of contacts with Covid-19 patients, and nursing workload with Covid-19 patients). A graphical picture of the study aims is presented in Figure 1.

Since no study focused on the relation between the type of unit and coping strategies during the pandemic, we had not a specific hypothesis regarding these relationships. The assessment of potential differences in the coping strategies of nurses working in different types of units might suggest the introduction of tailored psychological support interventions aimed at promoting specific coping strategies.

2 | METHODS

2.1 | Participants and procedure

A web-based questionnaire was administered online via Google Forms between December 1, 2020 and January 10, 2021. Completion time was approximately 20 min. After introducing the purposes and the procedure of the research, participants were requested to give their informed consent. Participants were informed that their participation was voluntary, that their responses would be anonymous, and that they could withdraw from the study at any moment without giving any justification. No incentives were provided to the survey participants. No participants’ names were in any way requested or attached to the questionnaires. All procedure studies and the administered instruments were fully compliant with the Declaration of Helsinki and with the Ethics Code of the Italian Board of Psychology (i.e., the regulatory Authority providing the national
guidelines for research and clinical practice). Subjects were recruited through the mainstream media (Facebook and LinkedIn) and using groups of professionals on instant messaging apps (Whatsapp and Telegram).

2.2 Measures

The questionnaire included sociodemographic questions (gender, age, marital status, living with family members in the same home, i.e., children or old relatives) and work-related information (years of working as a nurse, work setting, region, healthcare profession, nursing workload as measured by the frequency and intensity of contacts with Covid-19 patients and with other patients, respectively). Frequency of contacts with Covid-19 patients was measured through the following question: “How many contacts did you have with Covid-19 cases?”

The responses to the question related to frequency were coded according to the following categories: "None" = 1; "Occasional contacts (-2 contacts) = 2”; “Few contacts (3-5 contacts) = 3”; Several contact (6-8 contacts) = 4”; “Many contacts (9-10 contacts) = 5”; “A very large number of contacts (over 10 contacts) = 6.” The intensity of contacts with Covid-19 patients was measured through the following question: “How close were your contacts with Covid-19 cases?” The responses to the question related to intensity were coded according to the following categories: “Very low intensity contact (physical proximity without touch, attending the same environment)” = 1; “Low intensity contact (physical proximity with touch, conversation)” = 2”; “Moderate-intensity contact (maneuvers on other body parts than breathing tract, duration less than 5)” = 3; “Medium intensity contact (assistance maneuvers not on the airways, lasting more than 5')” = 4; “High-intensity contact (swab execution)” = 5; “Very high-intensity contact (advanced airways management)” = 6.

The COPE-NVI-25 was developed by Foà et al.25 with the aim to assess the coping styles adopted by subjects in difficult or stressful situations; this is a short version of the COPE.23 The COPE-NVI-25 showed as good psychometric skills as those shown by the original version. It is capable to evaluate coping strategies in a hospital context, where a simple and fast assessment is often required; it is
proved to be an instrument as valid as the original COPE, but easier to administer. The COPE-NVI-25 is a multi-dimensional inventory that assesses individual differences in coping styles. It is comprised of 25 items, which are rated on a 4-point scale ranging from 1 (I usually don’t do this at all) to 4 (I usually do this a lot).30 The instrument includes five subscales corresponding to five different coping styles: Social Support (example item: “I seek moral support from friends and relatives”), Avoidance Strategies (example item: “I admit to myself that I can’t deal with it, and quit trying”), Positive Attitude (example item: “I try to learn something good from experience”), Problem Solving (example item: “I focus on dealing with this problem and, if necessary, I put from other things aside”), and Turning to Religion (example item: “I try to find comfort in my religion”). A higher score on a particular subscale indicates a greater use of that specific coping strategy. In the present study, the scores for each one of the COPE-NVI-25 scales were calculated by summing the scores obtained by the participants on the items that were related to the target scale in the validation study.30 The reliability indices were good to excellent across all the COPE-NVI-25 scales (Social Support scale: Cronbach’s \( \alpha = .80 \); Avoidance Strategies scale: Cronbach’s \( \alpha = .72 \); Positive Attitude scale: Cronbach’s \( \alpha = .90 \); Problem Solving scale: Cronbach’s \( \alpha = .86 \); Turning to Religion scale: Cronbach’s \( \alpha = .96 \)).

2.3 | Data analyses

Data were processed using the statistical software SPSS 25.0 for Windows. Participants’ characteristics were analyzed through descriptive analyses. Continuous variables were expressed by means and standard deviations, while classification or rank variables were expressed by frequencies and percentages. Group comparisons based on gender and types of units were performed through independent-sample Student’s \( t \)-tests. For this analysis, effect sizes were calculated as Cohen’s \( d \) indices and were interpreted according to the following criteria: values equal to .80 or higher were interpreted as large, values up to .50 as medium, and values up to .20 as small. For this analysis, an \( \alpha \)-priori power analysis suggested that the required sample size to detect a medium effect with 80% power and a \( \beta \) value set at .05 was 156 participants.

The associations between age and work-related variables and COPE-NVI-25 scores were analyzed by calculating Pearson’s bivariate correlation coefficients. Values on the correlation coefficients were interpreted according to the following criteria provided by Cohen et al.:\(^{55}\) 0 < \( r \) < .30 = weak; .30 < \( r \) < .50 = moderate; .50 < \( r \) < .70 = strong; .70 < \( r \) < 1 = very strong. Power calculations were run for the correlational analysis: for a medium effect size, 80% power, and a significance set at \( p < .05 \), the required sample size for bivariate correlations was at least 64 participants.

Subsequently, a series of generalized linear models with maximum likelihood estimation method were carried out to explore the (a) main effects of socio-demographic (gender, age, and living with other people in the same home) and work-related variables (working age as a nurse, general nursing workload, number of contacts with COVID-19 patients, and nursing workload with Covid-19 patients) and type of unit (Covid-19 units vs. other units) and (b) the interaction effects (i.e., moderation effect) between types of unit and socio-demographic and work-related variables on coping strategies measured by the COPE-NVI scales. Statistical significance was set at \( p < .05 \).

3 | RESULTS

3.1 | Descriptive characteristics of the sample

Two hundred fifty-three nurses participated (mean age = 35.99 years, \( SD = 9.71 \); range = 23–60), of whom 190 (75.1%) were females. Two hundred eight (82.20%) worked in a Covid-19 unit. An overview of all characteristics of the participants is presented in Table 2.

3.2 | Group comparisons

The results of the independent-sample Student’s \( t \)-tests showed that women had significantly higher scores on the COPE-NVI-25 Social Support scale than men (\( t_{(251)} = -2.24, p = .026 \)), while no gender-related differences emerged on the scores of the other COPE-NVI-25 scales. As compared with the nurses working in other units, nurses working in a Covid-19 unit had significantly lower scores on the COPE-NVI-25 Avoidance Strategies scale (\( t_{(251)} = 2.07, p = .039 \)) and they had higher scores on the COPE-NVI-25 Positive Attitude scale (\( t_{(251)} = -2.17, p = .030 \)) and on the COPE-NVI-25 Social Support scale (\( t_{(251)} = -2.02, p = .044 \)). For these analyses, medium effect sizes were detected. No differences were detected between nurses working in a Covid-19 unit and those working in another unit on the other COPE-NVI-25 scale scores. An overview of the group comparisons is presented in Table 3; the correlations between age and work-related variables and COPE-NVI-25 scores are shown in Table 4.

3.3 | Associations between types of units, coping strategies, and moderating variables: Generalized linear models

The generalized linear model testing the effects of the type of unit, sociodemographic, and work-related variables and their interaction effects expressed by the \( B \)-coefficients and Wald’s significance test on the COPE-NVI Avoidance Strategies scores is displayed in Table 5. The results showed that nurses with younger age (\( B = -0.44, \) Wald’s \( \chi^2_{(1)} = 9.66, p = .002 \)) and those who worked in a Covid-19 unit (\( B = -14.51, \) Wald’s \( \chi^2_{(1)} = 9.41, p = .002 \)) had significantly lower COPE-NVI-25 Avoidance Strategies scale scores. In addition, as suggested by the interaction effects, older nurses working in a Covid-19 unit (\( B = 0.51, \) Wald’s \( \chi^2_{(1)} = 11.40, p = .001 \)) and the nurses working in a Covid-19 unit who had a younger working age (\( B = -0.42, \) Wald’s \( \chi^2_{(1)} = 7.11, p = .008 \)) reported significantly higher and lower COPE-NVI-25 Avoidance scale scores, respectively.
The generalized linear model testing the effects of the type of unit, sociodemographic, and work-related variables and their interaction effects expressed by the B-coefficients and Wald’s significance test on the COPE-NVI Positive Attitudes scores is displayed in Table 6. Women reported significantly lower COPE-NVI-25 Positive Attitude scale scores (B = −4.09, Wald’s χ²(1) = 4.38, p = .036). In addition, women who worked in a Covid-19 unit reported significantly higher COPE-NVI-25 Positive Attitude scale scores (B = 5.13, Wald’s χ²(1) = 5.68, p = .017).

The generalized linear model testing the effects of the type of unit, sociodemographic and work-related variables and their interaction effects expressed by the B-coefficients and Wald’s significance test on the COPE-NVI Social Support scores, displayed in Table 7, showed that the predictors did not have any effects on the scores of the COPE-NVI-25 Social Support scores.

4 | DISCUSSION
4.1 | General results

Little is known about the coping strategies adopted by the nurses during the second phase of the pandemic, and no study compared the coping strategies between the nurses working in Covid-19 units and those in other units. The present study examined potential
differences in the coping strategies between nurses working in Covid-19 units and nurses working in other units, and it investigated whether the association between the type of unit (Covid-19 unit vs. other units) and coping strategies might be moderated by a series of variables previously found to be related to coping during the pandemic, including socio-demographics (gender, age, living with family members in the same home) and work-related factors (working age as a nurse, general nursing workload, number of contacts with Covid-19 patients, and nursing workload with Covid-19 patients). A first analysis, subsequently supported by the generalized linear model analyses, showed that as compared with nurses in other units, those who worked in Covid-19 units were less likely to adopt avoidance strategies, but they were more likely to use positive attitudes towards stressful situations and seek social support. Nurses with younger age had lower avoidance strategies regardless of the unit type, while older nurses in Covid-19 units and the nurses working in Covid-19 units with a younger working age had higher and lower avoidance strategies, respectively. While women were initially found to have higher levels of social support seeking than men, subsequent analyses showed gender differences only in the positive attitudes, as women had lower positive attitudes than men, regardless of the unit type; finally, women in Covid-19 units reported more positive attitudes than women working in other units. A graphical representation of the results is presented in Figure 2, where solid and dashed lines represent main effects and moderation effects, respectively.

4.2 | Coping strategies amongst nurses in Covid-19 and other units

The fact that as compared with nurses in other units, those who worked in Covid-19 units were less likely to adopt avoidance

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**TABLE 3** Comparisons on COPE-NVI-25 scores between nurses working in Covid-19 units and nurses working in other units

| COPE-NVI-25 Avoidance Strategies | Working in other units | 45 | 9.76 | 4.739 | 2.073 | 251 | 0.064 | 2.505 | .039 | -.343 |
|----------------------------------|------------------------|----|------|-------|------|-----|-------|-------|------|-------|
|                                  | Working in Covid-19 units | 208 | 8.47 | 3.528 |      |     |       |       |      |       |

| COPE-NVI-25 Turning to Religion | Working in other units | 45 | 8.33 | 6.274 | 1.064 | 54.420 | -0.929 | 3.028 | .292 | -.215 |
|----------------------------------|------------------------|----|------|-------|------|-------|-------|-------|------|-------|
|                                  | Working in Covid-19 units | 208 | 7.28 | 4.547 |      |     |       |       |      |       |

| COPE-NVI-25 Positive Attitudes | Working in other units | 45 | 27.67 | 5.381 | -2.179 | 251 | -4.012 | -0.203 | .030 | .357 |
|----------------------------------|------------------------|----|------|-------|------|-----|-------|-------|------|-------|
|                                  | Working in Covid-19 units | 208 | 29.77 | 5.982 |      |     |       |       |      |       |

| COPE-NVI-25 Social Support | Working in other units | 45 | 16.11 | 4.696 | -2.029 | 251 | -3.524 | -0.052 | .044 | .334 |
|-----------------------------|------------------------|----|------|-------|------|-----|-------|-------|------|-------|
|                             | Working in Covid-19 units | 208 | 17.90 | 5.492 |      |     |       |       |      |       |

| COPE-NVI-25 Problem Solving | Working in other units | 45 | 20.04 | 4.666 | -1.689 | 251 | -3.236 | 0.248 | .092 | .279 |
|-------------------------------|------------------------|----|------|-------|------|-----|-------|-------|------|-------|
|                              | Working in Covid-19 units | 208 | 21.54 | 5.518 |      |     |       |       |      |       |

Note: COPE-NVI-25 = Coping Orientation to Problems Experienced-Nuova Versione Italiana 25 item version.

**TABLE 4** Pearson's bivariate correlations between age, work-related variables, and COPE-NVI-25 scores (n = 253)

|                  | 2. | 3. | 4. | 5. | 6. | 7. | 8. | 9. | 10. |
|------------------|----|----|----|----|----|----|----|----|----|
| Age              | .902** | -.106 | -.049 | -.287** | -.238** | .040 | -.021 | -1.133* | .103 |
| Working age as a nurse | -.089 | -.022 | -.261** | -.264** | .077 | -.040 | -1.143* | .069 |
| Number of contacts with Covid-19 patients | -.028 | .581** | .056 | -.006 | .057 | .050 | .064 |
| General nursing workload | .319** | -.052 | -.063 | .029 | .060 | .006 |
| Nursing workload with Covid-19 patients | .084 | -.103 | .055 | .053 | .071 |
| COPE-NVI-25 Avoidance Strategies | .153* | -.301** | -.144* | -.259** |
| COPE-NVI-25 Turning to Religion | -.054 | -.009 | .039 |
| COPE-NVI-25 Positive Attitudes | .227** | .495** |
| COPE-NVI-25 Social Support | .343** |
| COPE-NVI-25 Problem Solving | 1 |

Note: COPE-NVI-25 = Coping Orientation to Problems Experienced-Nuova Versione Italiana 25 item version.
*p < .05. **p < .01.
strategies, but more likely to use positive attitudes towards stressful situations suggests that nurses in Covid-19 units are characterized by more functional coping strategies than those in other units. This evidence appears to be to some extent in contrast with previous studies carried out during the first phase of the pandemic which showed that those nurses at the frontline may have less functional coping strategies. However, it should be noted that such studies did not distinguish between Covid-19 and other units. An explanation about this might derive from the so-called "Emotional Contrast Avoidance Theory" and from literature data on worry.

| TABLE 5 | General linear model of COPE-NVI-25 Avoidance Strategies scores |
| --- | --- |
| **B** | **95% CI** | **Wald’s χ²** | **df** | **p** |
| Intercept | 20.487 | 11.794 | 29.180 | 21.336 | 1 | .000 |
| Female gender | 1.482 | -0.749 | 3.714 | 1.695 | 1 | .193 |
| Living with other people in the same home | -0.053 | -0.402 | 3.919 | 0.001 | 1 | .979 |
| Age | -0.446 | -0.728 | -0.165 | 9.666 | 1 | .002 |
| Working age as a nurse | 0.272 | -0.019 | 0.562 | 3.353 | 1 | .067 |
| Number of contacts with Covid-19 patients | 0.232 | -0.083 | 0.547 | 2.081 | 1 | .149 |
| General nursing workload | 0.170 | -0.350 | 0.691 | 0.411 | 1 | .522 |
| Nursing workload with Covid-19 patients | 0.060 | -0.228 | 0.348 | 0.167 | 1 | .683 |
| Working in Covid-19 units | -14.518 | -23.791 | -5.245 | 9.416 | 1 | .002 |
| Working in Covid-19 units * female gender (interaction) | -1.258 | -3.710 | 1.194 | 1.011 | 1 | .315 |
| Working in Covid-19 units * living in the same home (interaction) | 0.560 | -3.660 | 4.780 | 0.068 | 1 | .795 |
| Working in Covid-19 units * age (interaction) | 0.516 | 0.216 | 0.815 | 11.400 | 1 | .001 |
| Working in Covid-19 units * working age as a nurse (interaction) | -0.420 | -0.729 | -0.111 | 7.111 | 1 | .008 |
| Working in Covid-19 units * general nursing workload (interaction) | -0.324 | -0.883 | 0.235 | 1.293 | 1 | .255 |

Note: COPE-NVI-25 = Coping Orientation to Problems Experienced-Nuova Versione Italiana 25 item version.

| TABLE 6 | General linear model of COPE-NVI-25 Positive Attitudes scores |
| --- | --- |
| **B** | **95% CI** | **Wald’s χ²** | **df** | **p** |
| Intercept | 31.873 | 16.970 | 46.776 | 17.571 | 1 | .000 |
| Female gender | -4.091 | -7.919 | -0.262 | 4.385 | 1 | .036 |
| Living with other people in the same home | -2.156 | -8.964 | 4.652 | 0.385 | 1 | .535 |
| Age | 0.054 | -0.427 | 0.536 | 0.049 | 1 | .825 |
| Working age as a nurse | 0.060 | -0.439 | 0.559 | 0.055 | 1 | .814 |
| Number of contacts with Covid-19 patients | -1.128 | -4.204 | 1.949 | 0.516 | 1 | .472 |
| General nursing workload | -0.197 | -1.109 | 0.715 | 0.178 | 1 | .673 |
| Nursing workload with Covid-19 patients | 0.038 | -0.460 | 0.536 | 0.023 | 1 | .880 |
| Working in Covid-19 units | -4.436 | -20.311 | 11.440 | 0.300 | 1 | .584 |
| Working in Covid-19 units * Female gender (interaction) | 5.137 | 0.914 | 9.361 | 5.685 | 1 | .017 |
| Working in Covid-19 units * living in the same home (interaction) | 3.194 | -4.036 | 10.425 | 0.750 | 1 | .387 |
| Working in Covid-19 units * age (interaction) | 0.021 | -0.490 | 0.532 | 0.006 | 1 | .937 |
| Working in Covid-19 units * working age as a nurse (interaction) | -0.190 | -0.720 | 0.339 | 0.496 | 1 | .481 |
| Working in Covid-19 units * general nursing workload (interaction) | 0.323 | -0.655 | 1.301 | 0.419 | 1 | .517 |

Note: COPE-NVI-25 = Coping Orientation to Problems Experienced-Nuova Versione Italiana 25 item version.
TABLE 7  General linear model of COPE-NVI-25 Social Support scores

|                                           | B    | 95% CI       | Wald's $\chi^2$ | df | p   |
|------------------------------------------|------|--------------|-----------------|----|-----|
| Intercept                                | 10.673 | -3.228 - 24.573 | 2.265          | 1  | .132|
| Female gender                            | 0.895 | -2.673 - 4.463 | 0.242          | 1  | .623|
| Living with other people in the same home | 1.146 | -5.206 - 7.498 | .125           | 1  | .724|
| Age                                      | 0.229 | -0.221 - 0.679 | 0.994          | 1  | .319|
| Working age as a nurse                   | -0.277 | -0.742 - 0.188 | 1.362          | 1  | .243|
| Number of contacts with Covid-19 patients| -0.025 | -0.529 - 0.479 | 0.010          | 1  | .922|
| General nursing workload                 | -0.198 | -1.030 - 0.634 | 0.217          | 1  | .641|
| Nursing workload with Covid-19 patients  | -0.207 | -0.667 - 0.254 | 0.773          | 1  | .379|
| Working in Covid-19 units                | 7.766 | -7.062 - 22.594 | 1.054          | 1  | .305|
| Working in Covid-19 units * Female gender (interaction) | 0.993 | -2.928 - 4.914 | 0.247          | 1  | .620|
| Working in Covid-19 units * living in the same home (interaction) | -1.832 | -8.579 - 4.916 | 0.283          | 1  | .595|
| Working in Covid-19 units * age (interaction) | -0.240 | -0.719 - 0.238 | 0.968          | 1  | .325|
| Working in Covid-19 units * working age as a nurse (interaction) | 0.199 | -0.295 - 0.693 | 0.622          | 1  | .430|
| Working in Covid-19 units * general nursing workload (interaction) | 0.497 | -0.396 - 1.390 | 1.191          | 1  | .275|

Note: COPE-NVI-25 = Coping Orientation to Problems Experienced-Nuova Versione Italiana 25 item version.

FIGURE 2  Result of the study (findings from the generalized linear models). Solid and dashed lines are main and moderation effects, respectively.
mechanisms according to which people who directly confront themselves with stressful situations are more likely to adopt strategies focused on the task, while people far from the problem may be more likely to use worry and avoidance behaviors as a strategy to get control of the anticipatory distress related to such events and prevent a negative emotional contrast. Overall, this result suggests that during the second phase of the pandemic, support interventions should be offered also to the nurses of non-Covid-19 units who might have dysfunctional coping strategies based upon avoidance. Avoidance is generally considered a coping strategy adopted by the person when facing a stressor when she/he perceives herself/himself incapable of managing the emotions that result from such stressor. Therefore, it might be useful whether interventions aimed to foster self-efficacy in managing emotions are implemented in non-Covid-19 units, as suggested in previous studies.

As mentioned before, a higher level of avoidance strategies amongst the nurses working in non-Covid-19 units might suggest the use of a tailored support intervention for this group of nurses, such as Acceptance and Commitment Therapy modules aimed to promote psychological flexibility, that is, the capacity to get in contact with negative feelings when facing stressful events.

The fact that the type of unit was not associated with problem solving suggests that perhaps interventions aimed at promoting this type of coping strategies might not be directed at a specific type of unit, but they would be useful for all the types of units.

4.3 Socio-demographic and work-related moderators of coping strategies in Covid-19 and other units

Initial analyses showed that gender differences emerged in the social support coping dimension: in particular, women were more likely to adopt social support as a coping strategy than men, in line with data from previous studies. As discussed in the Introduction, social support seeking has been generally found to be a dysfunctional coping strategy in most of the studies which used the COPE-NVI. However, such gender-based difference was not detected in subsequent analyses based on generalized linear models. In addition, women were less likely to use a coping style based on positive attitudes than men, in contrast with previous data. However, in the subgroup of nurses working in Covid-19 units, the data appeared to have a reversed direction, with more positive attitudes amongst women than men working in such units. The result that in the subgroup of nurses working with covid-19 patients, women were more likely to use positive attitudes than men may be considered in line with previous studies.

Since a greater workload of nurses was assigned to the Covid-19 units as compared to the workload assigned to non-Covid-19 settings in Italy, the result that non-Covid-19-unit nurses displayed less functional coping skills than their Covid-19-unit counterparts perhaps might be partly explained by diversion of resources and attention from non-Covid-19 units to Covid-19 ones.

Older nurses working in a Covid-19 unit were more likely to use avoidance strategies and the nurses working in a Covid-19 unit who had a younger working age were less likely to use avoidance strategies, in line with previous data and in agreement with other data showing that younger nurses report lower avoidance responses to the pandemic emergency. This result might be related to the fact that older nurses and those with an older nursing age might have a higher perception of the risk, as suggested by other authors in previous investigations. Specifically, older nurses might perceive themselves as more at risk for the development of the Covid-19 symptoms than younger ones. Alternatively, this result might be attributed to the so-called effect of “unrealistic optimism” (i.e., the tendency to unrealistically evaluate as positive a challenging event compared to its objective negative consequences) which is typical of younger people. Otherwise, a lower level of avoidance strategies amongst younger nurses than amongst older ones might be related to a higher work motivation present in the younger group of nurses, as suggested by previous studies. However, all these interpretations remain speculative as we did not use measures of these constructs to control for such effects.

4.4 Limitations and future directions

A key limitation concerns the cross-sectional design of the study that did not allow conclusions to be drawn about the causal directions of the relations between the variables. Future studies should use a longitudinal design to explore whether working in a Covid-19 unit or other units can predict changes in the coping strategies of nurses over time. Another shortcoming regards the use of self-report questionnaires. Through a multi-method approach, further research should investigate the coping strategies of the nurses by adopting multiple assessment modalities such as observational tools and interviews. In addition, an unequal distribution was observed for the categories within some of the variables including gender, living with relatives in the same home, and the type of unit. However, the assumption of the homogeneity of the variances was not violated, that is such group comparisons were allowed.

Furthermore, it would be interesting whether additional variables potentially involved in the coping strategies are considered in future research, such as having tested positive for Covid-19 infection, having lost a loved one for Covid-19, the level of nurses’ turnover and other, not examined, psychological outcomes such as posttraumatic symptoms. Another variable that might have a role in the coping strategies may be ethnicity. A limitation of our study included the fact that all the nurses were Italian; this limited the generalizability of the findings. Therefore, future research should investigate whether ethnicity might moderate the relation between the type of unit and the coping strategies.

In addition, the present study compared Covid-19 units and other units; however, it would be useful whether future research aims to explore potential differences in the coping strategies between Covid-19 units and specific types of non-Covid-19 units such as community healthcare services, surgery units, and mental health services, where the effects of the pandemic could have had a different impact on the coping responses of the nurses.
Finally, another aspect which needs for a closer investigation regards the effects of the types of units and coping strategies on the psychological adjustment of the nurses. Future studies should include measures of both negative (e.g., stress) and positive (e.g., quality of life) psychological adjustment with the aim to ascertain whether different coping strategies might act as protective or vulnerability mechanisms across different types of units.

4.5 | Implications for nursing management and practice

Nurses working in Covid-19 areas show more functional coping strategies than their colleagues working in Covid-19-free settings; nurse managers should verify these strategies steadily among nurses working in Covid-19-free units. The systematic use of the COPE-NVI-25 scale could lead managers to an early identification of those nurses with dysfunctional coping models and to eventually plan and prioritize tailored support interventions to promote psychological flexibility, such as the creation and spreading of information contents and the implementation of peer support teams.

Organizational strategies also should aim to enhance care for patients affected by Covid-19: whereas possible, an appropriate job rotation between Covid-19 and Covid-19-free areas may reduce dysfunctional coping strategies and increase the capacity to get in contact with negative feelings. Not only nurses working on the frontline but also their "second-line" colleagues should be supported to face the magnitude of these unexpected events, also in future.

5 | CONCLUSIONS

The results of the present study suggest that in the second phase of the pandemic, nurses who work in close and constant interaction with Covid-19 patients show more functional coping attitudes than their colleagues employed in Covid-19-free areas. Overall, men are more likely to use positive attitudes than women and experienced professionals display a higher use of avoidance strategies than the younger ones, irrespective of the unit type they work in. As compared with men, women working with Covid-19 patients show an increased use of positive attitudes and a higher search for social support. These aspects should be considered to strengthen nurses’ strategies to face any future major stressful events.

DATA AVAILABILITY STATEMENT
The data that support the findings of this study are available from the corresponding author upon reasonable request.

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