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COPING STRATEGIES AND RISK PERCEPTION IN EMERGENCY AND SYSTEMATIC CRISIS SITUATIONS. DEVELOPMENT AND VALIDATION OF A SCALE (CORE)

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In recent years, a pivotal challenge in safeguarding mental health and ensuring worker safety has been the focus on identifying and empowering protective factors while addressing psychosocial risk factors in response to the stresses encountered in daily life. Coping strategies have emerged as a central point in this context. The development and validation of a scale measuring coping strategies during particularly risky situations, such as those experienced by certain professions during the pandemic, could represent a significant step toward a deeper understanding of the mechanisms governing the utilization of coping strategies. The study was conducted on a sample of 872 individuals (398 men, 474 women) recruited toward the end of the pandemic, primarily involving workers who found themselves managing risky situations. The results, revealed a four-factor first-order structure and two second-order factors, indicating distinct dimensions of coping strategies employed by individuals when facing negative life events perceived as high-risk. Additional validation included a gender invariance analysis, confirming the scale was similarly perceived by both genders. Convergent validity was assessed by correlating the CORE's (Coping Orientations to Risky Events) subscales and higher-order factors with the Brief COPE scale's approach and avoidance coping components, ensuring they measured the same constructs.

Keywords: Coping; High risk situations; Adaptive; Maladaptive; Workers at risk.

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One of the most significant challenges in recent years regarding mental health protection (and worker safety) is certainly related to the care and empowerment of protective factors and attention toward psychosocial risk factors in the face of stressful events in the daily lives of individuals. In this regard, there is increasing attention in all areas toward coping strategies, particularly in risky situations, utilized by individuals. In the literature, the concept of coping is often associated with that of stress, considered today as an adaptive and dynamic process expressed in the mutual and dynamic interaction between the individual and the environment. The most well-known theoretical formulation on coping and stress is that proposed by Lazarus (1974), later refined with Folkman in 1984 (Lazarus & Folkman, 1984). Their cognitive-transactional theory considers stress as the outcome of the transaction between environmental and personal

variables, mediated by cognitive evaluations; concurrently, they consider coping as an adaptive process given by the efforts made to manage the demands of the context. Therefore, the individual's response is not conditioned by the stimulus itself, but by the value given by the individual. General indicators of mental health such as the presence of adaptive coping strategies can improve individuals' perseverance, resilience, and adaptation throughout their lives (Ivaskevych et al., 2020; Shaw et al., 2020; Skinner & Zimmer-Gembeck, 2007), especially in relevant situations like the pandemic context (Faulkner et al., 2020; Guan et al., 2020).

On the other hand, maladaptive coping strategies may also emerge in the face of adversity, such as anxious behaviors (Daniels & Holtfreter, 2019), avoidance behaviors (Melodia et al., 2020), rationalization cognitions (Moral-Jiménez & González-Sáez, 2020), and dissociation of one's emotions and cognitions (Guglielmucci et al., 2019).

Individuals under extreme pressure may not adequately embrace contextual demands, resulting in the activation of maladaptive coping strategies. When maladaptive coping predominates, the individual typically exhibits psychopathological indicators such as stress, anxiety, and phobia (Di Nota et al., 2021; Orgilés et al., 2021; Peres et al., 2021).

One of the most widely reported examples in the literature regarding coping strategies used in risky situations is that of nurses, who to deliver quality care to terminal patients need to appropriately employ adaptive strategies (Placis et al., 2017). Recent literature data demonstrate that even the category of first responders, continuously exposed to stressful situations, when using problem-solving coping strategies, report a higher level of psychological well-being (Di Gesto et al., 2022). Another context in which adaptive strategies play a fundamental role and are closely related to life satisfaction and psychological well-being is that of chronic illnesses (pulmonary diseases, cardiovascular diseases, cancer, etc.), for which long-term management is extremely necessary, making the mediating role of coping strategies essential (Auriemma et al., 2023).

The relationship between coping and stressful events is typically process-oriented. It seems that each individual cognitively processes the stimulus situation, evaluating its potential significance, one's ability to cope with it, the sense of control over the situation, and finally, the potential consequences. Over the years, psychologists and researchers have identified various coping strategies. Because of this, classifications of coping strategies vary from author to author (Carver & Connor-Smith, 2010; Connor-Smith & Flachsbart, 2007; Skinner et al., 2003). Typically, three macro categories have been identified: problem-focused coping, emotion-focused coping, avoidance-focused coping.

Problem-focused coping is defined as a behavioral coping strategy, and examples include seeking help and taking direct action in a difficult situation. It focuses on defining the problem, planning, seeking alternative solutions, weighing the costs and benefits of various scenarios, and, especially, taking action. Problem-focused coping aims to exert control and find a solution (Lazarus & Folkman, 1984) and is predominantly used in situations where the individual evaluates problematic conditions as changeable. Problem-focused coping thus appears to be a more effective strategy in managing stressful situations that are somehow modifiable (such as relational conflicts) or in reducing negative effects on one's health and well-being (Folkman & Moskowitz, 2004). Lazarus and Folkman (1984) then defined *emotion-focused coping* as a cognitive process that involves, for example, positive thinking and the expression of emotions, aimed at tolerating stressful situations. This process is predominantly a stress reduction strategy that seems useful for situations where there is nothing to be done about the stressor and is often used in situations where people cannot change environmental conditions. This type of coping is person-centered and focuses on emotional responses, self-concern, and reactions developed at a fantasy level. Emotion-focused coping appears to be effective in situations where stressors are not modifiable (Lazarus & Folkman, 1984). Insofar as it may improve the level of comfort rather than reduce stress per se, it appears to be a less effective strategy for coping with stress compared to problem-focused coping. In

general, emotion-focused coping appears to be negatively related to individual health and well-being (Penley & Tomaka, 2002). Some researchers have identified a third coping strategy, *avoidance-focused coping*, in which individuals simply try to avoid the problem, perhaps hoping that time will resolve it on its own (Endler & Parker, 1994). In general, avoidance-focused coping seems to work decently in situations that are less controllable. Examples include distracting oneself by watching TV or reading a book, seeking recreational or social activities, and even using drugs or alcohol. Endler and Parker (1994) argue that avoidance differs from emotion-focused coping in terms of content: the former avoids problems by seeking distractions and social pastimes, while the latter tries to regulate negative emotions. Avoidance-focused coping appears to be an ineffective strategy for responding to stress as it does not solve the problem or at least does not address the root of the problem itself. Studies have shown that this type of strategy often leads to increased tension, worsened health, and reduced well-being in stressful situations (Aldwin & Revenson, 1987; Ben-Zur, 2009).

Existing Instrument and New Avenues in Measuring Coping Strategies

Extensive coverage of the scientific literature on the topic reveals that the construct of "coping strategies" has been extensively investigated and various measurement alternatives have been proposed over time. Despite the existence of many instruments, some authors (Bongelli et al., 2022; Kato, 2015) agree that the most widely used are the COPE (Coping Orientation to Problems Experienced; Carver et al., 1989) and the Ways of Coping Questionnaire (WCQ; Folkman & Lazarus, 1988; Lazarus & Folkman, 1984).

The Ways of Coping Checklist (WCCL), developed by Folkman and Lazarus (1980) is an instrument designed to measure strategies used in specific stressful situations. The 68-item scale is divided into seven different subscales that aim to evaluate defensive coping, information seeking, problem solving, palliation, action inhibition, direct action, and magical thinking. Although the WCCL has been used in several studies, its factorial stability, clinical generalizability, construct validity, and length have prompted more than a few critical comments from several authors (Amirkhan, 1990; Carver et al., 1989; O'Reilly-Shah, 2017; Parker et al., 1993; Vitaliano et al., 1985). In Italy, the scale is actually used as a revised form with 42 items and five factors, adopting the name of Ways of Coping Checklist-Revised (WCCL-R; Vitaliano et al., 1985; Zurlo et al., 2018,) or in the form of Dialecting Behavior Therapy Ways of Coping Checklist (Neacsiu et al., 2010; Roder et al., 2014). The Ways of Coping Questionnaire (WCQ) is also an adaptation of the original WCCL (Folkman & Lazarus, 1988; Lazarus & Folkman, 1984), but uses a 4-point frequency scale instead of the yes/no response format. Although the WCQ was designed to improve the clarity of the WCCL, it retains the same critical issues as it consists of 66 items and eight factors: confrontation, distancing, self-control, social support seeking, acceptance of responsibility, avoidance of escape, planned problem solving, and positive reappraisal (Folkman & Lazarus, 1985; Folkman et al., 1986).

The other scale widely used in the literature is the COPE (Carver et al., 1989), which is developed to measure the way stress is responded to. The instrument presents the same critical points as indicated above in terms of length and practicality of use, as it consists of 60 items divided into 13 subscales: active coping, planning, suppression of competing activities, restraint coping, search for instrumental social support, search for emotional social support, positive reinterpretation, acceptance, denial, recourse to religion, venting emotions, behavioral disengagement, and mental disengagement.

In order to make the scale more functional and easier to use, Carver (1997) subsequently developed a 28-item version of the COPE (the Brief COPE). Despite the significant results obtained at the beginning of the use of this scale, subsequent validation studies produced conflicting results concerning

the factorial structure of the instrument in different cultures (Cramer et al., 2019; Garcia et al., 2018; Ingledew et al., 1996; Miyazaki et al., 2008; Muller & Spitz, 2003; Rahman et al., 2021; Su et al., 2015). Brief COPE has also been widely used in Italy, involving different contexts and target populations: clinical patients (De Feudis et al., 2015; Perna et al., 2007; Pozzi et al., 2015); general population (Monzani et al., 2015); healthcare workers (Mattei et al., 2017; Sansoni et al., 2016); during the Covid-19 pandemic (Bongelli et al., 2021; Canestrari et al., 2021), and analyzing dimensional and situational aspects (Bongelli et al., 2022; Monzani et al., 2015).

Among the various existing instruments, mention should also be made of the Coping Inventory for Stressful Situations (CISS) scale, which Endler and Parker (1990a) developed in 48 items and three subscales (task-, emotion- and avoidance-oriented coping strategies), and its short form (CISS-21; Endler & Parker, 1994, 1999). The respective Italian versions are extant in the literature and widely used (Pisanti et al., 2015; Sirigatti & Stefanile, 2009), albeit with some limitations and criticalities; as far as the internal consistency of the CISS-21 is concerned, for example, only the emotion-oriented coping subscale showed adequate internal consistency, whereas the internal consistencies of the other dimensions were only acceptable. This is consistent with other previous studies that used English and non-English versions of the scale (Boysan, 2012; Cohan et al., 2006), showing that poor internal consistency is a critical issue of the scale and not of the translation. It is thus in this context that the construction and development of the CORE (Coping Orientations to Risky Events) scale serves as a functional response to a gap in relation to specific coping strategies that are used in high-risk situations.

Methods

Study Design

In the process of developing the CORE, we addressed two main phases, divided into seven steps, which allowed us to conduct the study: instrument development and instrument evaluation. Regarding the instrument development phase, we followed three steps. Initially, we constructed a conceptualization of coping strategies (adaptive vs. maladaptive) based on a thorough literature review. Specifically, our definition of coping strategies was broad and included both proactive and maladaptive behaviors. Secondly, a pool of items was generated that we believed could measure coping strategies in particularly risky situations. The item pool was created following the guidelines proposed by Clark and Watson (1995), which suggest that the items in the pool should be based on the definition developed in the literature review. In the third step, a pilot test and content validity were conducted. Content validity is the degree to which an instrument has an appropriate sample of items for the construct being measured and is an important procedure in scale development. Once the first phase of instrument development was completed, we proceeded to the second phase, instrument evaluation, which comprised four steps. In the fourth step, we conducted an exploratory factor analysis (EFA) using principal component analysis to examine the factor structure and estimate additional internal consistency reliabilities for the test scores of the identified factors. The number of retained items for each factor was initially determined by theoretical considerations of the psychological meaningfulness of the factor and subsequently by statistical considerations (Costello & Osborne, 2019; Thurstone, 1947). In the fifth step, the identified structure was replicated using confirmatory factor analysis (CFA). In the sixth step, we conducted a gender invariance analysis to check whether the scale was perceived in the same way by both genders. In the seventh and final step, we verified convergent and discriminant validity (see Figure 1).

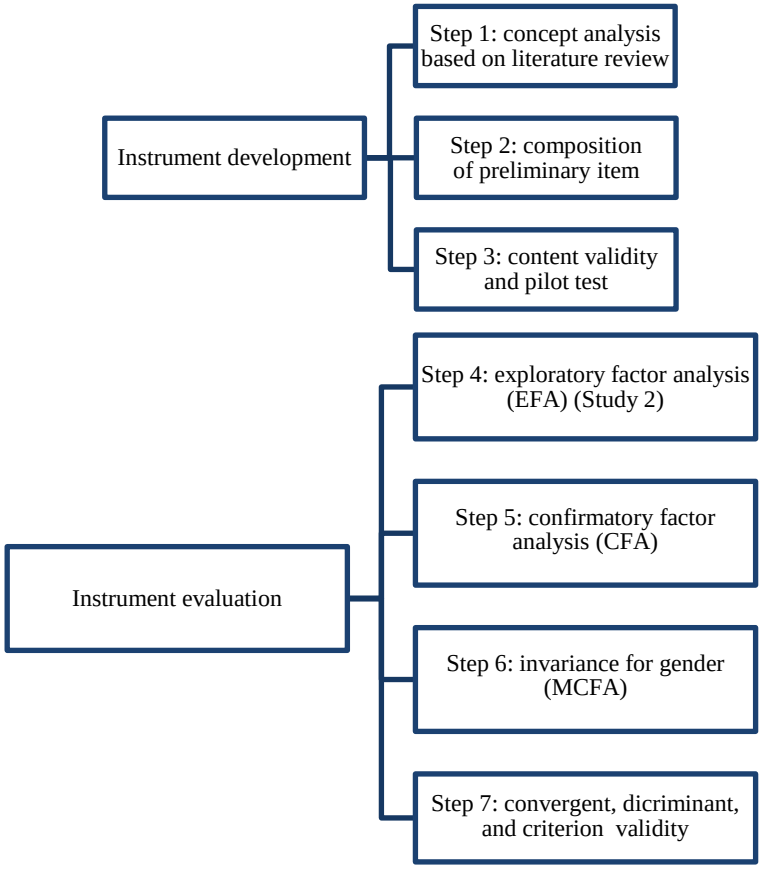

FIGURE 1
Scale development process

Concept analysis was initiated during the questionnaire's initial developmental phase through a review of the literature and a focus group interview (FGI). Initially, an item pool was generated by reviewing relevant literature on coping strategies scales. The inclusion criteria for studies were as follows: publication within the past 10 years, in English. The scope of the interview was determined based on the literature review.

Five focus groups were conducted with adult participants, ensuring heterogeneity in terms of gender, age, status, profession, and so forth. Questions for the focus groups were formulated in line with the principles outlined by the reference theory. Utilizing significant phrases derived from the literature review and focus group interviews (FGI), preliminary questions were developed. Each question was designed to convey a single concept. The literature review included articles published on PubMed and Scopus, using keywords such as "strategies," "coping," "risk," "adaptive," and "maladaptive."

Composition of Preliminary Item

Utilizing the noteworthy statements extracted from both the literature review and the focus group interview (FGI), preliminary questions were derived. Clear and straightforward sentences were employed, ensuring that each question conveyed a singular concept. Each statement was reformulated as a question, and

each question's wording and relevance were assessed with minor adjustments. Then, 47 preliminary items of the CORE were extracted and categorized.

STUDY 1
CONTENT VALIDITY AND PILOT TESTING

The content validity index was calculated in both forms: item-CVI (I-CVI) and scale-level CVI (S-CVI). The I-CVI of 42 preliminary items varied from .50 to 1.0, and the scale-level content validity index/average (S-CVI/Ave) and the scale-level content validity index/universal agreement (S-CVI/UA) were .84 and .89, respectively. Based on the content validity results and experts' recommendations, eight items were deleted and five were revised to improve clarity. Finally, 37 items were selected for the pilot test.

The pilot test was conduct on the 30 workers engaged in professions where they may encounter particularly risk situations (firefighters, emergency room doctors, armed forces, etc.). In the pilot test, I-CVI ranged from .70 to 1.0, and S-CVI/Ave and S-CVI/UA were .94 and .79, respectively. Finally, 26 items with I-CVI ranging from .80 to 1.0, an S-CVI/Ave of .94, and an S-CVI/UA of .83, were selected.

Participants and Procedure

Participants (N = 872) were recruited toward the end of the pandemic, primarily involving workers who found themselves managing risk situations (healthcare professionals, teachers, armed forces, etc.). This process included 398 men and 474 women with an average age of 36.7 years (SD = 2.76). Participants were contacted via written communication; once approval was obtained from the Human Resources Department of the University of Catania, Italy, a link to the survey was sent via email. All participants received a survey package that included the questionnaire with scales, a cover letter explaining the purpose of the study, and a consent form emphasizing that participation was anonymous and voluntary and that the data would be used exclusively in aggregated form. Out of 968 contacted individuals, 90.1% completed the entire questionnaire. The data collection period spanned from March to December 2022. The participants showed a relatively high level of education, with 54% reporting having at least a bachelor's degree. Additionally, participants hailed from various regions in Italy (North 29%, Central 31%, South 40%).

Measures

The following measures were completed by all participants.

Dispositional resilience (DRS). The DRS Italian validation by Picardi et al. (2012) is a self-completed questionnaire consisting of 15 items, scored on a 4-point scale ranging from 0 (*not at all true*) to 3 (*completely true*). The instrument includes positively and negatively keyed items covering the three conceptually important hardiness facets of commitment, control, and challenge. In addition to a total score, the DRS yields scores for three subscales: commitment, control, and challenge. Scores for each subcomponent range from 0 to 15. The composite hardiness score ranges from 0 to 45.

Brief COPE. The Brief COPE (Garcia et al., 2018) is the short version of the original COPE scale, designed to assess different coping responses to stressful situations. It is a self-assessment tool consisting of 14 subscales, totalling 28 questions, designed to evaluate various coping strategies for stressful life events.

These strategies include both effective and ineffective approaches. The 28 items are measured with scores ranging from 1 (*I have not been doing this at all*) to 4 (*I have been doing this a lot*). Higher subscale scores indicate greater use of that coping strategy.

The Compound Psychological Capital Scale (CPC-12). The CPC-12 was used for the assessment of the psychological capital construct, proposed by Lorenz and colleagues (2016), the Italian version of which was constructed by Platania and Paolillo (2022). The construct of Psychological Capital draws from positive psychology and more specifically from positive organizational behavior. The scale consists of 12 items, containing the four components of psychological capital: *hope* (measured by three items, e.g., "Right now, I see myself as being pretty successful"), *resilience* (measured by three items, e.g., "When I am in a difficult situation, I can usually find my way out of it"), *optimism* (measured by three items, e.g., "Overall, I expect more good things to happen to me than bad"), and *self-efficacy* (measured by three items, e.g., "I can solve most problems if I invest the necessary effort"). For each statement, answers were provided through a 7-point Likert scale from 1 = *strongly disagree* to 7 = *strongly agree*.

Satisfaction With Life Scale (SWLS). The SWLS (Diener et al., 1985) is a short 5-item instrument designed to measure cognitive judgments overall satisfaction with one's life (Diener et al., 1985). The participant responds on a 7-point scale from 1 (*completely disagree*) to 7 (*completely agree*) and is asked to indicate how each statement fits with him/her.

Perceived Stress Scale (PSS). The PSS is one of the most widely used instruments to measure the perception of stress. The items are designed to assess the unpredictability, uncontrollability, and overload of one's life. The original instrument is a 14-item scale (PSS-14) that was developed in English (Cohen et al., 1983); with seven positive and seven negative items rated on a 5-point Likert scale, from 1 = *never* to 5 = *very often*. The 10 items short version was validated five years later.

Data Analysis

The data collected through the questionnaire survey underwent analysis to assess content validity, construct validity, which included exploratory factor analysis (EFA), confirmatory factor analysis (CFA), and convergent validity, as well as reliability. IBM/SPSS Statistics for Windows Version 27.0 and M-Plus software Version 6 were utilized for this purpose. To evaluate the content validity of the scale, the proportion of experts awarding three or four points was divided by the total number of experts, resulting in an item-level content validity index (I-CVI). Items with an I-CVI score of .80 or higher were considered suitable. The scale-level content validity index/average (S-CVI/Ave) was calculated by averaging the I-CVI values for each item, while the scale-level content validity index/universal agreement (S-CVI/UA) was determined by assessing the proportion of items achieving a perfect I-CVI score of 1.0. S-CVI/Ave was deemed satisfactory if it exceeded .90, and S-CVI/UA was considered adequate if it surpassed .80. Item analysis involved examining mean, standard deviation, skewness, kurtosis, item-total correlation (ITC), and Cronbach's alpha values post-item removal. Items with skewness and kurtosis absolute values of 2.0 or more were discarded, while ITC values exceeding .30 were considered acceptable.

Descriptive statistics were utilized to summarize the general characteristics and measurement outcomes of the subjects. EFA appropriateness was assessed using the Kaiser-Meyer-Olkin (KMO) test, Bartlett's test of sphericity, and measures of sampling adequacy (MSA) value in anti-image matrices. Factors with factor loadings of .40 or higher and cumulative variances exceeding 60.0% were retained.

CFA model fit was evaluated using several measures, including chi-square statistics (χ^2), standardized chi-square statistics (χ^2/df), standardized root-mean-square residual (SRMR), root-mean-square error of approximation (RMSEA), Tucker-Lewis index (TLI), and comparative fit index (CFI). Threshold values for these fitness indices were established. An RMSEA value close to .06 suggests a good fit, values between .07 and .08 indicate a moderate fit, and values between .08 and .10 point to a marginal fit. For CFI and TLI, higher values signify a better fit, with values above .95 indicating a very good fit, those between .90 and .95 suggesting a marginally acceptable fit, and values below .90 reflecting a poor fit.

Convergent validity was assessed based on conditions such as construct reliability (CR) exceeding .70 and average variance extracted (AVE) surpassing .05. Discriminant validity among latent factors was tested by comparing the AVE of each construct with its shared variance with any other construct. Reliability analysis involved Cronbach's alpha for internal consistency and split-half reliability of the data. Cronbach's alpha values greater than .70 were deemed acceptable for both the complete scale and individual factors. Additionally, the χ^2 and $\Delta\chi^2$ values were employed and compared among competing models, assuming multivariate normality and sensitivity to sample size.

To further assess sensitivity to sample size, the Akaike information criterion (AIC) and Bayesian information criterion (BIC) were utilized, where lower values indicate a better fit. The ΔCFI index was also employed, with values not exceeding .01 indicating equivalence of the models in terms of fit.

Results

Exploratory Factor Analysis (EFA)

The primary aim of the initial exploratory analysis was to establish the factor structure of the items within the item pool in our study sample (N = 872). Our approach began with an examination of the factorability of the variables, followed by the implementation of both parallel and factor analyses.

The results of the Kaiser-Meyer-Olkin test of sampling adequacy (.82) indicated the data's suitability, and the Bartlett's test, χ^2 = 6496.70 (gl = 325), $p <$ .001, confirmed the factorability of the data. According to the parallel analysis, our sample suggested retaining four factors, with eigenvalues ranging from 15.2 to 7.28. Consequently, we fixed the extraction to four factors. The 26 items explained 64% of the cumulative variance in the model. The communality of all the 26 items was higher than .40 and ranged from .40 to .73. The factor loading ranged from .50 to .88 (Table 1).

Considering the factor content, we proposed the following names for the factors. Factor 1 encompassed items related to *avoidance*, understood as a maladaptive coping strategy, involves making changes to our behavior to avoid thinking, feeling, or doing things that we perceive as difficult to manage (eight items, α = .83). Factor 2 evaluated participants' those *negative emotions* (anxiety, fear, etc.) that hinder a person from developing adaptive coping strategies and emerge when stress levels are high (six items, α = .85). Factor 3 encompassed items related to the positive behaviors that a person engages in to adapt to the situation; this factor was labeled *proactive behavior* (six items, α = .80). Factor 4 denoted as *emotional support* (six items, α = .78) involves the support that a person believes to have from those around them, even in challenging times, thus making the perceived risky situation more manageable.

TABLE 1
Factor loadings for pPrincipal component analysis with promax rotation of the CORE (*N* = 872)

Item	Comunality	F1	F2	F3	F4
		Avoidance	Negative emotions	Proactive behavior	Emotional support
10. I dedicate more time to work/activities to avoid thinking about the risky situation	.539	.690			
11. I am uncertain about what to do when a particularly risky situation arises	.546	.763			
13. When I feel overwhelmed by anxiety, I try not to dwell on it	.525	.682			
15. I try to do many things in order to tire myself out when I perceive a particularly risky situation	.513	.538			
20. I wish I could change my concerns and feelings when I perceive high-risk situations	.389	.685			
21. I eat more during high-risk situations	.477	.596			
22. I drink more alcohol during high-risk situations	.417	.629			
23 During particularly risky situations, I often find myself thinking that I refuse to believe what is happening	.590	.694			
1. I live with anxiety about the current reality that surrounds me	.684		.848		
2. I struggle with the current reality that surrounds me	.728		.879		
3. I live with difficulty the current reality that surrounds me	.653		.803		
24. I often unload my fears onto others	.595		.559		
25. I fear for my life when high-risk situations arise	.684		.721		
26. I fear for the people I care about when high-risk situations arise	.728		.532		
7. I perceive my role as crucial in dealing with the risky situation	.382			.730	
8. I perceive my role positively in the current situation because I feel capable of facing the risk	.557			.792	
9. I would like to be more assertive in addressing the risks arising from the current situation	.623			.502	
12. I believe that there is always a way to overcome problems, even in particularly risky situations.	.523			.629	
19. When I feel overwhelmed by anxiety, I try to focus on what I will do next	.408			506	

(table 1 continues)

Table 1 (continued)

Item	Comunality	F1	F2	F3	F4
		Avoidance	Negative emotions	Proactive behavior	Emotional support
14. When I feel anger about a risky situation, I try to engage in activities to control it	.609			.598	
4. I feel that I have the necessary support from friends	.694				.830
5. I feel that I have the necessary support from my family	.642				.775
6. I feel that I have the necessary support from my colleagues in the workplace	.707				.795
16. I need to perceive that the people around me believe they can overcome the risky situation	.526				.702
17. I need care and understanding from the people close to me	.381				.577
18. During particularly risky periods, I try to stay close to the people who are important to me					.504

Note. Factor loadings < .3 are not displayed.

Item Analysis

For each item, the mean score ranged from 1.79 to 4.18, with a standard deviation of .81 to 1.31 (Table 2). The skewness ranged from –1.24 to .94, and the kurtosis ranged from –1.20 to .96, indicating the dataset's normality. Finally, the ITC ranged from .13 to .56, and Cronbach's alpha value after item removal was .86 (.79-.86).

TABLE 2
Mean, standard deviation, skewness, and kurtosis

Items	Min	Max	*M*	*SE*	Skewness	Kurtosis
1. I live with anxiety about the current reality that surrounds me (r)	1	5	2.11	.06	.10	–1.25
2. I struggle with the current reality that surrounds me (r)	1	5	1.89	.06	.28	–1.17
3. I live with difficulty the current reality that surrounds me (r)	1	5	2.04	.06	.16	–1.27
4. I feel that I have the necessary support from friends	1	5	3.96	.05	1.15	.22
5. I feel that I have the necessary support from my family	1	5	3.85	.06	–.90	–.37

(table 2 continues)

Table 2 (continued)

Items	Min	Max	*M*	*SE*	Skewness	Kurtosis
6. I feel that I have the necessary support from my colleagues in the workplace	1	5	3.49	.06	1.34	–.37
8. I perceive my role positively in the current situation because I feel capable of facing the risk	1	5	3.32	.07	1.43	–1.20
9. I would like to be more assertive in addressing the risks arising from the current situation	1	5	3.90	.05	1.12	–.24
7. I perceive my role as crucial in dealing with the risky situation	1	5	4.18	.06	–1.11	.32
10. I dedicate more time to work/activities to avoid thinking about the risky situation I live with anxiety about the current reality that surrounds me (r)	1	5	2.71	.05	–.86	–.12
11. I am uncertain about what to do when a particularly risky situation arises (r)	1	5	2.98	.06	–.15	–1.08
12. I believe that there is always a way to overcome problems, even in particularly risky situations	1	5	4.10	.05	.99	.91
13. When I feel overwhelmed by anxiety, I try not to dwell on it (r)	1	5	2.29	.06	1.32	–1.10
14. When I feel anger about a risky situation, I try to engage in activities to control it	1	5	3.86	.05	–.84	.11
15. I try to do many things in order to tire myself out when I perceive a particularly risky situation (r)	1	5	2.51	.06	–.13	–1.13
16. I need to perceive that the people around me believe they can overcome the risky situation	1	5	3.35	.05	–.33	–.83

(table 2 continues)

Table 2 (continued)

Items	Min	Max	*M*	*SE*	Skewness	Kurtosis
17. I need care and understanding from the people close to me	1	5	3.32	.06	–.30	–1.05
18. During particularly risky periods, I try to stay close to the people who are important to me	1	5	4.17	.05	–1.24	.96
19. When I feel overwhelmed by anxiety, I try to focus on what I will do next	1	5	3.12	.06	–.14	–1.02
20. I wish I could change my concerns and feelings when I perceive high-risk situations (r)	1	5	1.79	.06	.63	–1.00
21. I eat more during high-risk situations (r)	1	5	2.02	.06	.53	–1.11
22. I drink more alcohol during high-risk situations (r)	1	5	2.11	.06	–.33	–1.15
23. During particularly risky situations, I often find myself thinking that I refuse to believe what is happening (r)	1	5	2.32	.07	–.33	–1.43
24. I often unload my fears onto others (r)	1	5	2.11	.07	–.16	–1.31
25. I fear for my life when high-risk situations arise (r)	1	5	2.95	.06	–.50	–.80
26. I fear for the people I care about when high-risk situations arise (r)	1	5	3.01	.06	–.83	–1.22

Note. (r) = reversed item.

Confirmatory Factor Analysis (CFA)

After the EFA and item analysis on our sample of 872 participants, we conducted a CFA. In the confirmatory factor analysis, three models for the 26-item coping strategies data were tested (see Table 3). Initially, a first-order model was tested to check if the results of the exploratory analyses could be replicated. In this model, no hypotheses were made about higher order latent constructs of coping strategies, but it was suggested that the four factors correlated in principal component analysis (PCA) and exploratory factor analysis (EFA) could be replicated. First, we tested the model without residual error covariances; this produced a good fit of the fit indices that made us think we were approaching the optimal scale structure —$\chi^2(293, N = 872) = 895.14$, $p < .001$, $\chi^2/df = 3.06$; RMSEA = .08; CFI = .88; TLI = .88; SRMR = .06; AIC = 421.204; BIC=324. 316 —; we thus conducted another CFA by adding the residual error covariances. As shown in Table 3 all indices show improvement over the baseline model — $\chi^2(289, N = 872) = 822. 16$, $p < .001$, $\chi^2/df = 2.8$; RMSEA = .079; CFI

= .90; TLI = .90; SRMR = .05; AIC = 361.219; BIC = 453.222 —; furthermore, this is also confirmed by the χ^2 difference test — $\Delta\chi^2$ (4) = 72.98, $p < .001$. Subsequently, two models hypothesizing higher order coping strategy constructs were tested. The second-order model proposed that coping strategies were a unidimensional concept at the second order, while the third-order model suggested that coping strategies comprised two factors, adaptive and maladaptive, at the second order and were unidimensional at the third order. For the third-order model, theory guided the determination of whether the first-order factors were adaptive or maladaptive coping strategies. Factors primarily consisting of adaptive elements were considered adaptive coping factors (proactive behavior and emotional support), while those primarily composed of maladaptive elements were considered maladaptive coping factors (avoidance and negative emotions).

TABLE 3
Confirmatory factor analysis: Goodness-of-fit summary for three CORE models (N = 872)

Model	Index								
	χ^2	*df*	SRMR	RMSEA	RMSEA [90% CI]	CFI	TLI	AIC	BIC
First-order model	822.16*	289	.05	.079	[.070, .089]	.90	.90	361.219	453.222
Second-order model	918.24*	418	.03	.052	[.047, .690]	.94	.94	218.350	311.258
Third-order model	1.019.57*	417	.04	.062	[.059, .071]	.92	.92	228.360	419.193

Note. *df* = degrees of freedom; SRMR = standardized root-mean-square residual; RMSEA = root-mean-square error of approximation; CI = confidence interval; CFI = comparative fit index; TLI = Tucker-Lewis index; AIC = Akaike information criterion; BIC = Bayesian information criterion.
*$p < .001$.

The goodness-of-fit indices for the structural models showed that the first-order model had good fit indices, supporting the structural validity of the exploratory analyses. For the two higher order models, the second-order model demonstrated excellent fit for the CFI and TLI, unlike the third-order model, which had acceptable CFI and TLI values. The SRMR and RMSEA were excellent for both higher order models, although the third-order model had a slightly narrower 90% confidence interval for RMSEA. To further assess the higher order models, they were compared using the Satorra-Bentler scaled chi-square difference test. The results indicated that the difference between the second-order model (nested) and the third-order model was significant, $\chi^2(1, N = 872) = 101.33$, $p < .001$, suggesting that the second-order model fitted the data better. Overall, considering the relatively similar fit indices and the chi-square test favoring the second-order model, the second-order model was considered the most suitable higher order model (see Figure 2). Factor 1 at the second order included items reflecting proactive behavior and emotional support and was named *adaptive coping* (12 items, α = .84). Factor 2 contained items illustrating maladaptive behaviors in response to risk situations, such as avoidance and negative emotions; hence, it was named *maladaptive coping* (14 items, α = .85). The second-order model effectively reflected the underlying structure of the CORE.

Multiple-Group Confirmatory Factor Analysis (MCFA) for Gender

A sequence of multiple-group confirmatory factor analyses (MCFA) was conducted to assess the measurement equivalence across gender groups. Different levels of equivalence were examined, progressively becoming more stringent, as recommended by Cheung (2008) and Lance et al. (2000).

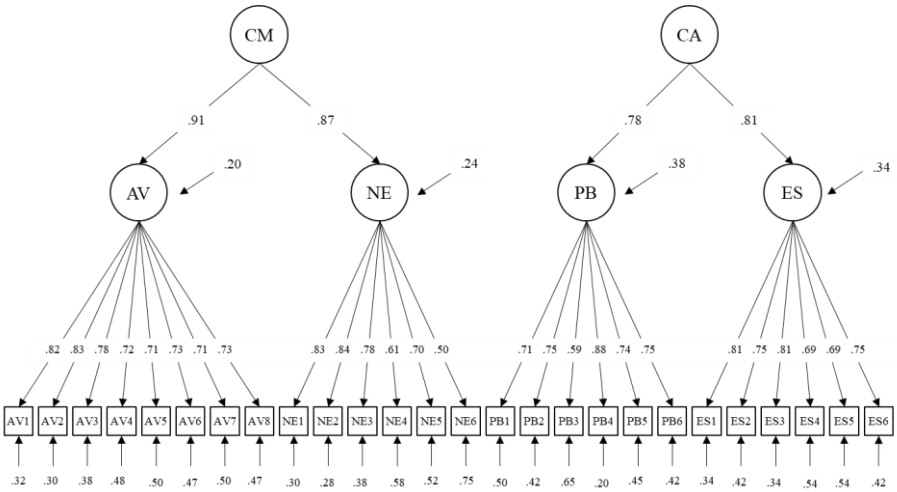

FIGURE 2
Second-order model

Note. CM = coping maladaptive; CA = coping adaptive; AV = avoidance; NE = negative emotion; PB = proactive behavior; ES = emotional support.

The initial multiple-group analysis tested a model of configural invariance (Model 1) by simultaneously assessing the fit of male and female samples. The fit indices, including $\chi^2(398) = 976.1$, $p < .001$; CFI = .94; SRMR = .04; RMSEA = .06, indicated a good fit for this model. This supported an equivalent structure consisting of two second-order factors with four first-order factors for CORE across both genders. This configural model served as the baseline for comparing subsequent equivalence models (Byrne & van de Vijver, 2014). Model 2 was then examined for metric invariance. The findings, with $\Delta\chi^2$M2-M1(1) = 16.4 and ΔCFI = .001, suggested that Model 2 was statistically equivalent to Model 1, thus supporting metric invariance. Furthermore, measurement scalar invariance (Model 3) and error invariance (Model 4) were established, with findings of $\Delta\chi^2$M3-M2(6) = 35.3, ΔCFI = .000, and $\Delta\chi^2$M4-M3(7) = 38.6, ΔCFI = .000, respectively.

Following this, the equivalence in factor variances (Model 5) was examined and found to be viable, with $\Delta\chi^2$M5-M4(8) = 16.7, ΔCFI = .000. Finally, the equivalence in factor covariances (Model 6) was tested by integrating the model with Model 5, showing support with $\Delta\chi^2$M6-M5(11) = 41.6, ΔCFI = .000. Overall, the results were highly satisfactory, demonstrating invariant model fit across both male and female populations (Table 4).

TABLE 4
Fit statistics for measurement invariance by gender (N = 872)

Model	$\chi^2(df)$	CFI	SRMR	RMSEA	ΔCFI
1. Configural invariance	976.1 (398)	.94	.04	.06 (.059-.067)	–
2. Metric invariance	992.5 (399)	.93	.04	.06 (.059-.067)	.001
3. Scalar invariance	1027.8 (405)	.93	.05	.06 (.059-.067)	.000
4. Measurement error invariance	1066.4 (412)	.93	.05	.06 (.057-.066)	.000
5. Structural variance invariance	1083.1 (420)	.93	.05	.06 (.057-.066)	.000
6. Structural covariance invariance	1124.7 (431)	.93	.05	.06 (.057-.066)	.000

Note. *df* = degrees of freedom; CFI = comparative fit index; SRMR = standardized root-mean-square residual; RMSEA = root-mean-square error of approximation.

Convergent, Discriminant, and Criterion Validity

Convergent Validity

Table 5 shows descriptive statistic and correlation matrix for the study variables. The high positive relationship between adaptive coping and maladaptive coping of CORE with approach coping and avoidant coping of the Brief COPE (including second-order factors, negative emotions, avoidance, proactive behavior, and emotional support) confirms that they are two similar but not identical construct. In particular, the correlation between adaptive coping (CORE) and approach coping (Brief COPE) (r =.61, p < .001) was higher than the one between adaptive coping (CORE) and avoidant coping (Brief COPE) (r = –.54, p < .001). Moreover, the correlation between maladaptive coping (CORE) and avoidant coping (Brief COPE) was high (r = .65, p < .001 vs. r = .55, p < .001). Those results support convergent validity of the scale.

TABLE 5
Descriptive statistics and intercorrelations (N = 872)

	M	*SD*	α	CR	AVE	1	2	3	4	5	6	7
1. Avoidance (CORE)	2.34	.91	.86	.92	.57	1						
2. Negative emotion (CORE)	2.35	.96	.84	.86	.52	.68**	1					
3. Proactive behavior (CORE)	3.75	.74	.87	.88	.55	–.62**	–.75**	1				
4. Emotional support (CORE)	3.7	.72	.81	.91	.65	–.73**	–.62**	.71**	1			
5. Adaptive coping (CORE)	3.72	.73	.84	.92	.57	–.52**	–.58**	.64**	.61**	1		
6. Maladaptive coping (CORE)	2.35	.93	.85	.93	.56	.64**	.58**	–.57**	–.59**	–.56**	1	
7. Approach coping (Brief COPE)	3.38	.69	.86	.90	.54	–.52**	–.43**	.36**	.29**	.61**	–.52**	1
8. Avoidant coping (Brief COPE)	2.54	.75	.76	.84	.51	.72**	.56**	–.41**	–.32**	–.54**	.68**	–.71**

Note. CR = composite reliability; AVE = average variance extracted. CORE = Coping Orientations to Risky Events. COPE = Coping Orientation to Problems Experienced.
**p < .001.

Criterion Validity

Table 6 presents descriptive statistics, Cronbach's alpha, and bivariate correlations for the variables of the study. As expected, the CORE scale showed significant correlations with all the variables, according to literature (Folkman & Lazarus, 1980). Specifically, it showed the highest positive correlations between adaptive coping and satisfaction with life (r = .35, p < .001), and psychological capital (r = –.38, p < .001), and dispositional resilience (r = .34, p < .001), and negative correlation with perceived stress (r = –.41, p < .001). Moreover, maladaptive coping negatively correlated with psychological capital (r = –.37, p < .001), satisfaction with life (r = –.30, p < .001), and dipositional resilience (r = –.41, p < .001), and positively correlated with perceived stress (r = .42, p < .001).

TABLE 6
Descriptive statistics and Pearson correlations of the variables of the study (N = 872)

	M	*SD*	α	CR	AVE	1	2	3	4	5
1. Adaptive coping	3.72	.73	.84	.92	.57	1				
2. Maladaptive coping	2.35	.93	.85	.93	.56	–.56**	1			
3. Satisfaction with life	5.69	1.71	.83	.86	.57	.35**	–.30**	1		
4. Perceived stress	3.81	.72	.79	.81	.52	–.41**	.42**	–.37**	1	
5. Psychological capital	6.01	.96	.89	.92	.61	.38**	–.37**	.44**	–.33**	1
6. Dispositional resilience	2.41	.75	.90	.94	.57	.34**	–.47**	.39**	–.28**	.58**

Note. CR = composite reliability; AVE = average variance extracted.
**p < .001.

Discriminant Validity

Discriminant validity among latent factors (Farrell, 2010) was tested, using the Fornell and Larcker (1981) technique, by comparing the AVE of each construct with its shared variance with any other construct. It was supported for all the two latent constructs, where the AVE for maladaptive coping (.56) and for adaptive coping (.57) was greater than the shared variance (e.g., square of the correlation) between the two constructs (.32).

DISCUSSION

The main aim of the study was to develop a measurement tool capable of assessing coping strategies in the face of situations perceived as particularly risky, such as the COVID-19 pandemic. The use of coping strategies in situations perceived as particularly risky is extremely important for several reasons. Among these, stress reduction is crucial because high-risk situations can generate significant levels of stress. Utilizing effective coping strategies can help reduce perceived stress levels and manage negative emotions associated with such situations (Platania, Gruttadauria, et al., 2022; Platania, Morando, et al., 2022). This can have significant benefits for individuals' mental and physical health.

Another important factor could be the improvement of adaptive functioning. Coping strategies can help individuals maintain adaptive functioning even in difficult situations by promoting problem-solving and adaptation to circumstances, enabling individuals to address situations constructively. Additionally, facing risky situations can severely test individuals' emotional well-being. Using coping strategies such as social support and seeking positive perspectives can promote emotional well-being and psychological resilience in the face of challenges (Caponnetto et al., 2022).

Lastly, but not least, there is the prevention of dysfunctional behaviors. In the absence of adequate coping strategies, individuals may be inclined to adopt dysfunctional or maladaptive behaviors, such as avoidance or substance abuse, to cope with stress. Using effective coping strategies can help prevent harmful behaviors and promote more adaptive behaviors.

From the results of scale development and validation, the CORE (Coping Orientations to Risky Events) appears as a second-order scale with four subscales (emotional support, proactive behavior, negative emotions, and avoidance) and two second-order factors (adaptive coping and maladaptive coping). This indicates distinct dimensions of coping strategies employed by individuals when facing negative life events

perceived as high-risk. After conducting a concept analysis, 47 items were developed to measure the construct. The pilot test and content validity led to a further reduction of items to 37, which the pilot test eventually fixed at 26. Exploratory factor analysis determined a four-factor structure, identifying two factors measuring adaptive behavior (emotional support, proactive behavior) and two measuring maladaptive behavior (negative emotions, avoidance).

Confirmatory factor analysis conducted using structural equation modeling (SEM) confirmed the factorial structure of the scale with very high adaptation indices, initially suggesting the possibility of a third-order factorial structure given the good fit values present in the latter. Once the factorial structure of the CORE was confirmed, additional confirmations of the instrument's validity were carried out, including an invariance analysis by gender, which revealed that the scale was perceived as invariant regarding gender, indicating that it was perceived in the same way.

Finally, convergent validity was executed by correlating the four subscales and the two higher order factors of the CORE with the Brief COPE scale divided into approach coping and avoidance coping to verify if they measured the same construct. Another validity test (criterion validity) followed, where several related and predictive constructs from the literature (psychological capital, perceived stress, and satisfaction with life) were correlated with the second-order factors of the CORE. The results confirmed the CORE as a tool capable of measuring the construct. Lastly, discriminant validity verified that the average variance extracted between the two second-order factors was higher than the shared variance between them.

It is thus in this context that the construction and development of the CORE scale serves as a functional response to a gap in relation to specific coping strategies used in high-risk situations. Considering the reduced number of items, the CORE, compared to existing scales, is also a very useful tool in terms of brevity and functionality while maintaining excellent psychometric properties. In fact, the scale succeeds in intercepting in a few subfactors (adaptive coping and maladaptive coping) the coping strategies in high-risk situations, managing to adequately summarize and separate positive and negative emotions and behavior.

At present, the instrument also has limitations. First and foremost, it would require a longitudinal study to demonstrate greater validity over time. Another important factor is that it should also be compared with a normative sample to verify the adaptability of the scale to different types of samples. Conducting the analyses on a single overall sample does indeed limit its reliability. Since this is a pilot study, we aim to address this limitation with future studies on the scale.

Conclusion

In psychological literature, a correlation between coping strategies and perceived stress has been extensively documented. Coping refers to the methods individuals employ to manage stress and difficult situations in their lives. Coping strategies can be categorized into various types, such as active coping (e.g., problem-solving), emotional coping (e.g., seeking social support), and maladaptive coping (e.g., substance use).

Numerous studies have examined how different coping strategies influence individuals' perception of stress. For instance, it has been demonstrated that the use of active coping and problem-solving strategies is often associated with lower levels of perceived stress, while the use of passive or dysfunctional strategies may be correlated with higher levels of perceived stress.

Moreover, it is important to consider that the relationship between coping strategies and perceived stress can vary depending on various factors, such as personality, cultural context, and specific characteristics of the stressful situation. However, generally, there is a trend in research suggesting that adopting effective

coping strategies can help individuals better manage stress and reduce their level of perceived stress. The CORE scale can be used both to prevent certain maladaptive behaviors and to understand the mechanisms behind the coping strategies individuals employ in particularly risky situations.

References

Aldwin, C. M., & Revenson, T. A. (1987). Does coping help? A reexamination of the relation between coping and mental health. *Journal of Personality and Social Psychology*, *53*(2), 337-348. https://doi.org/10.1037//0022-3514.53.2.337

Amirkhan, J. H. (1990). A factor analytically derived measure of coping: The Coping Strategy Indicator. *Journal of Personality and Social Psychology*, *59*(5), Article 1066. https://doi.org/10.1037/0022-3514.59.5.1066

Auriemma, E., Maiello, A., Esposito, C., & Freda, M. F. (2023). *Il ruolo delle strategie di coping nell'associazione tra rappresentazione di malattia e qualità della vita in un campione di pazienti italiani con noncommunicable diseases* [The role of coping strategies in the association between illness representation and quality of life in a sample of Italian patients with noncommunicable diseases]. FrancoAngeli.

Ben-Zur, H. (2009). Coping styles and affect. *International Journal of Stress Management*, *16*(2), 87-101. https://doi.org/10.1037/a0015731

Bongelli, R., Canestrari, C., Fermani, A., Muzi, M., Riccioni, I., Bertolazzi, A., & Burro, R. (2021). Associations between personality traits, intolerance of uncertainty, coping strategies, and stress in Italian frontline and non-frontline HCWs during the Covid-19 pandemic. A multi-group path-analysis. *Healthcare*, *9*(8), Article 1086. https://doi.org/10.3390/healthcare9081086

Bongelli, R., Fermani, A., Canestrari, C., Riccioni, I., Muzi, M., Bertolazzi, A., & Burro, R. (2022). Italian validation of the situational Brief Cope Scale (I-Brief Cope). *Plos One*, *17*(12), Article e0278486. https://doi.org/10.1371/journal.pone.0278486

Boysan, M. (2012). Validity of the coping inventory for stressful situations-short form (CISS-21) in a non-clinical Turkish sample. *Dusunen Adam Journal of Psychiatry and Neurological Sciences*, *25*(2), 101-107. https://doi.org/10.5350/DAJPN2012250201

Byrne, B. M., & van de Vijver, F. J. R. (2014). Factorial structure of the Family Values Scale from a multilevel-multicultural perspective. *International Journal of Testing*, *14*(2), 168-192. https://doi.org/10.1080/15305058.2013.870903

Canestrari, C., Bongelli, R., Fermani, A., Riccioni, I., Bertolazzi, A., & Burro, R. (2021). Coronavirus disease stress among Italian healthcare workers: The role of coping humor. *Frontiers in Psychology*, *11*, Article 601574. https://doi.org/10.3389/fpsyg.2020.601574

Caponnetto, P., Platania, S., Maglia, M., Morando, M., Gruttadauria, S. V., Auditore, R., Ledda, C., Rapisarda, V., & Santisi, G. (2022). Health occupation and job satisfaction: The impact of psychological capital in the management of clinical psychological stressors of healthcare workers in the COVID-19 era. *International Journal of Environmental Research and Public Health*, *19*(10), Article 6134. https://doi.org/10.3390/ijerph19106134

Carver, C. S. (1997). You want to measure coping but your protocol'too long: Consider the brief cope. *International Journal of Behavioral Medicine*, *4*(1), 92-100. https://doi.org/10.1207/s15327558ijbm0401_6

Carver, C. S., & Connor-Smith, J. (2010). Personality and coping. *Annual Review of Psychology*, *61*, 679-704. https://doi.org/10.1146/annurev.psych.093008.100352

Carver, C. S., Scheier, M. F., & Weintraub, J. K. (1989). Assessing coping strategies: A theoretically based approach. *Journal of Personality and Social Psychology*, *56*(2), 267-283. https://doi.org/10.1037/0022-3514.56.2.267

Cheung, M. W.-L. (2008). A model for integrating fixed-, random-, and mixed-effects meta-analyses into structural equation modeling. *Psychological Methods*, *13*(3), 182-202. https://doi.org/10.1037/a0013163

Clark, LA, & Watson, D. (1995). Costruire la validità: Problemi di base nello sviluppo della scala oggettiva [Construct validity: Basic problems in developing the objective scale]. *Psychological Assessment*, *7*(3), 309-319. https://doi.org/10.1037/1040-3590.7.3.309

Cohan, S. L., Jang, K. L., & Stein, M. B. (2006). Confirmatory factor analysis of a short form of the coping inventory for stressful situations. *Journal of Clinical Psychology*, *62*(3), 273-283. https://doi.org/10.1002/jclp.20211

Cohen, S., Kamarck, T., & Mermelstein, R. (1983). A global measure of perceived stress. *Journal of Health and Social Behavior*, *24*(4), 385-396. https://doi.org/10.2307/2136404

Connor-Smith, J. K., & Flachsbart, C. (2007). Relations between personality and coping: A meta-analysis. *Journal of Personality and Social Psychology*, *93*(6), 1080-1107. https://doi.org/10.1037/0022-3514.93.6.1080

Costello, A. B., & Osborne, J. (2019). Best practices in exploratory factor analysis: Four recommendations for getting the most from your analysis. *Practical Assessment, Research, and Evaluation*, *10*(1), Article 7. https://doi.org/10.7275/jyj1-4868

Cramer, R. J., Braitman, A., Bryson, C. N., Long, M. M., & La Guardia, A. C. (2019). The Brief COPE: Factor structure and associations with self-and other-directed aggression among emerging adults. *Evaluation & the Health Professions*, *43*(2), 120-130. https://doi.org/10.1177/0163278719873698

Daniels, A. Z., & Holtfreter, K. (2019). Moving beyond anger and depression: The effects of anxiety and envy on maladaptive coping. *Deviant Behavior*, *40*(3), 334-352. https://doi.org/10.1080/01639625.2017.1422457

De Feudis, R., Lanciano, T., & Rinaldi, S. (2015). Coping strategies of southern Italian women predict distress following breast cancer surgery. *Europe's Journal of Psychology*, *11*(2), 280-294. https://doi.org/10.5964%2Fejop.v11i2.908

Di Gesto, C., Alessio, M., & Policardo, G. R. (2022, November). *Coping e compassion: Uno studio esplorativo sui livelli di stress percepito e benessere psicologico in un gruppo di soccorritori italiani* [Coping and compassion: An exploratory study on levels of perceived stress and psychological well-being in a group of Italian first responders]. First National Congress CBT-Italia, Firenze, Italy. https://doi.org/10.13140/RG.2.2.34017.58729

Di Nota, P. M., Kasurak, E., Bahji, A., Groll, D., & Anderson, G. S. (2021). Coping among public safety personnel: A systematic review and meta-analysis. *Stress and Health*, *37*(4), 613-630. https://doi.org/10.1002/smi.3039

Diener, E. D., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985). The satisfaction with life scale. *Journal of Personality Assessment*, *49*(1), 71-75.

Endler, N. S., & Parker, J. D. (1994). Assessment of multidimensional coping: Task, emotion, and avoidance strategies. *Psychological Assessment*, *6*(1), 50-60. https://doi.org/10.1037/1040-3590.6.1.50

Endler, N.S., & Parker, J. D. A. (1999). *Inventario di coping per situazioni stressanti: Manuale* [Coping inventory for stressful situations: Handbook] (2nd ed.). Multi-Health Systems

Farrell, A. M. (2010). Insufficient discriminant validity: A comment on Bove, Pervan, Beatty, and Shiu (2009). *Journal of Business Research*, *63*(3), 324-327.

Faulkner, G., Rhodes, R. E., Vanderloo, L. M., Chulak-Bozer, T., O'Reilly, N., Ferguson, L., & Spence, J. C. (2020). Physical activity as a coping strategy for mental health due to the COVID-19 virus: A potential disconnect among Canadian adults? *Frontiers in Communication*, *5*, Article 571833. https://doi.org/10.3389/fcomm.2020.571833

Folkman, S., & Lazarus, R. S. (1980). An analysis of coping in a middle-aged community sample. *Journal of Health and Social Behavior*, *21*(3), 219-239. https://www.jstor.org/stable/2136617

Folkman, S., & Lazarus, R. S. (1985). If it changes it must be a process: Study of emotion and coping during three stages of a college examination. *Journal of Personality and Social Psychology*, *48*(1), 150-170. https://doi.org/10.1037/0022-3514.48.1.150

Folkman, S., & Lazarus, R. S. (1988). *Manual for the ways of coping questionnaire*. Consulting Psychologists Press.

Folkman, S., Lazarus, R. S., Dunkel-Schetter, C., DeLongis, A., & Gruen, R. J. (1986). Dynamics of a stressful encounter: Cognitive appraisal, coping, and encounter outcomes. *Journal of Personality and Social Psychology*, *50*(5), 992-1003. https://doi.org/10.1037/0022-3514.50.5.992

Folkman, S., & Moskowitz, J. T. (2004). Coping: Pitfalls and promise. *Annual Review of Psychology*, *55*, 745-774. https://doi.org/10.1146/annurev.psych.55.090902.141456

García, F. E., Barraza-Peña, C. G., Wlodarczyk, A., Alvear-Carrasco, M., & Reyes-Reyes, A. (2018). Psychometric properties of the Brief-COPE for the evaluation of coping strategies in the Chilean population. *Psicologia: Reflexão e Crítica*, *31*. https://doi.org/10.1186/s41155-018-0102-3

Guan, Y., Deng, H., & Zhou, X. (2020). Understanding the impact of the COVID-19 pandemic on career development: Insights from cultural psychology. *Journal of Vocational Behavior*, *119*, Article 103438. https://doi.org/10.1016/j.jvb.2020.103438

Guglielmucci, F., Monti, M., Franzoi, I. G., Santoro, G., Granieri, A., Billieux, J., & Schimmenti, A. (2019). Dissociation in problematic gaming: A systematic review. *Current Addiction Reports*, *6*, 1-14. https://doi.org/10.1007/s40429-019-0237-z

Ingledew, D. K., Hardy, L., Cooper, C. L., & Jemal, H. (1996). Health behaviours reported as coping strategies: A factor analytical study. *British Journal of Health Psychology*, *1*(3), 263-281. https://doi.org/10.1111/j.2044-8287.1996.tb00508.x

Ivaskevych, D., Fedordhuck, S., Petrushevsky, Y., Borysova, O., Ivaskevich, O., Kohut, I., Marynych, V., & Tukaiev, S.. (2020). Association between competitive anxiety, hardiness, and coping strategies: A study of the national handball team. *Journal of Physical Education and Sport*, *20*(Supll. Issue 1), 359-365. https://doi.org/10.7752/jpes.2020.s1051

Kato, T. (2015). Frequently used coping scales: A meta-analysis. *Stress and Health*, *31*(4), 315-323.

Lance, C. E., Vandenberg, R. J., & Self, R. M. (2000). Latent growth models of individual change: The case of newcomer adjustment. *Organizational Behavior and Human Decision Processes*, *83*(1), 107-140. https://doi.org/10.1006/obhd.2000.2904

Lazarus, R. S. (1974). Psychological stress and coping in adaptation and illness. *The International Journal of Psychiatry in Medicine*, *5*(4), 321-333.

Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal, and coping*. Springer Publishing Company.

Lorenz, T., Beer, C., Pütz, J., & Heinitz, K. (2016). Measuring psychological capital: Construction and validation of the compound PsyCap scale (CPC-12). *PloS One*, *11*(4), Article e0152892. https://doi.org/10.1371%2Fjournal.pone.0152892

Mattei, A., Fiasca, F., Mazzei, M., Abbossida, V., & Bianchini, V. (2017). Burnout among healthcare workers at L'Aquila: Its prevalence and associated factors. *Psychology, Health & Medicine*, *22*(10), 1262-1270. https://doi.org/10.1080/13548506.2017.1327667

Melodia, F., Canale, N., & Griffiths, M. D. (2020). The role of avoidance coping and escape motives in problematic online gaming: A systematic literature review. *International Journal of Mental Health and Addiction*, *20*, 996-1022. https://doi.org/10.1007/s11469-020-00422-w

Miyazaki, Y., Bodenhorn, N., Zalaquett, C., & Ng, K. M. (2008). Factorial structure of brief cope for international students attending US colleges. *College Student Journal*, *42*(3), 795-807.

Monzani, D., Steca, P., Greco, A., D'Addario, M., Cappelletti, E., & Pancani, L. (2015). The situational version of the Brief COPE: Dimensionality and relationships with goal-related variables. *Europe's Journal of Psychology*, *11*(2), 295-310. https://doi.org/10.5964/ejop.v11i2.935

Moral-Jiménez, M. D. L. V., & González-Sáez, M. E. (2020). Distorsiones Cognitivas y Estrategias de Afrontamiento en Jóvenes con Dependencia Emocional [Cognitive distortions and strategies coping in young people with emotional dependence]. *Revista Iberoamericana de Psicología y Salud*, *1*(1), 15-30. https://doi.org/10.23923/j.rips.2020.01.032

Muller, L., & Spitz, E. (2003). Évaluation multidimensionnelle du coping: Validation du Brief COPE sur une population française [Multidimensional assessment of coping: Validation of the Brief COPE in a French population]. *L'Encéphale*, *29*(1), 507-518. https://www.researchgate.net/publication/344279846

Neacsiu, A. D., Rizvi, S. L., Vitaliano, P. P., Lynch, T. R., & Linehan, M. M. (2010). The dialectical behavior therapy ways of coping checklist: Development and psychometric properties. *Journal of Clinical Psychology*, *66*(6), 563-582. https://doi.org/10.1002/jclp.20685

O'Reilly-Shah, V. N. (2017). Factors influencing healthcare provider respondent fatigue answering a globally administered in-app survey. *PeerJ*, *5*, Article e3785. https://doi.org/10.7717/peerj.3785

Orgilés, M., Morales, A., Delvecchio, E., Francisco, R., Mazzeschi, C., Pedro, M., & Espada, J. P. (2021). Coping behaviors and psychological disturbances in youth affected by the COVID-19 health crisis. *Frontiers in Psychology*, *12*, Article 565657. https://doi.org/10.3389/fpsyg.2021.565657

Parker, J. D., Endler, N. S., & Bagby, R. M. (1993). If it changes, it might be unstable: Examining the factor structure of the Ways of Coping Questionnaire. *Psychological Assessment*, *5*(3), 361-368. https://doi.org/10.1037/1040-3590.5.3.361

Penley, J. A., & Tomaka, J. (2002). Associations among the Big Five, emotional responses, and coping with acute stress. *Personality and Individual Differences*, *32*(7), 1215-1228. https://doi.org/10.1016/S0191-8869(01)00087-3

Peres, R. S., Frick, L. T., Queluz, F. N. F. R., Fernandes, S. C. S., Priolo, S. R., Stelko-Pereira, A. C., Martins, J. Z., Lessa, J. P. A., Veiga, H. Magali da Silva, & Cortez, P. A. (2021). Evidências de validade de uma versão brasileira da Fear of COVID-19 Scale [Evidence of the validity of a Brazilian version of the Fear of COVID-19 Scale]. *Ciência & Saúde Coletiva*, *26*, 3255-3264. https://doi.org/10.1590/1413-81232021268.06092021

Perna, F., Sutera, M., Simpson, E. E. A., Maiani, G., Intorre, F., Polito, A., Cuzzolaro, M., & Temperilli, F. (2007). Tratti di personalità e capacità di coping in una popolazione di 132 anziani esenti da sintomi maggiori di depressione e/o deterioramento cognitivo [Personality traits and coping skills in a population of 132 older adults free of symptoms major depression and/or cognitive impairment]. *Giornale di Gerontologia*, *55*(2), 87-91.

Picardi, A., Bartone, P. T., Querci, R., Bitetti, D., Tarsitani, L., Roselli, V., Maraone, A., Fabi, E., De Michele, F., Gaviano, I., Flynn, B., Ursano, R., & Biondi, M. (2012). Development and validation of the Italian version of the 15-item dispositional resilience scale. *Rivista di Psichiatria*, *47*(3), 231-237. https://doi.org/10.1708/1128.12446

Pisanti, R., Melchiori, F. M., Lombardo, C., Sagliano, T., Violani, C., Lazzari, L., & Lazzari, D. (2015). Validation of the Italian version of the coping inventory for stressful situations-short version among hospital-based nurses. *Psychological Reports*, *117*(2), 457-472. https://doi.org/10.2466/08.03.PR0.117c22z1

Placis, E. C., Martínez, M. M., Mas, J. P., & Genís, M. V. (2017). Emociones y estrategias de afrontamiento del personal de salud ante los cuidados del final de la vida. Revisión Bibliográfica [Emotions and coping strategies of health care personnel in the face of end-of-life care. Bibliographic review]. *Ágora de Enfermería*, *21*(2), 84-88.

Platania, S., Gruttadauria, S. V., & Morando, M. (2022). Dispositional resilience as mediator in psychological stress on healthcare workers: A multi-group analysis of frontline and non-frontline workers. *European Journal of Investigation in Health, Psychology and Education*, *12*(9), 1285-1299. https://doi.org/10.3390/ejihpe12090089

Platania, S., Morando, M., Caruso, A., & Scuderi, V. E. (2022). The effect of psychosocial safety climate on engagement and psychological distress: A multilevel study on the healthcare sector. *Safety*, *8*(3), Article 62. https://doi.org/10.3390/safety8030062

Platania, S., & Paolillo, A. (2022). Validation and measurement invariance of the Compound PsyCap Scale (CPC-12): A short universal measure of psychological capital. *Anales de Psicología/Annals of Psychology*, *38*(1), 63-75. https://doi.org/10.6018/analesps.449651

Pozzi, G., Frustaci, A., Tedeschi, D., Solaroli, S., Grandinetti, P., Di Nicola, M., & Janiri, L. (2015). Coping strategies in a sample of anxiety patients: Factorial analysis and associations with psychopathology. *Brain and Behavior*, *5*(8), Article e00351. https://doi.org/10.1002/brb3.351

Rahman, H. A., Bani Issa, W., & Naing, L. (2021). Psychometric properties of Brief-COPE inventory among nurses. *BMC Nursing*, *20*, 1-7. https://doi.org/10.1186/s12912-021-00592-5

Roder, E., Cavarra, M., Gaj, N., Visintini, R., & Maffei, C. (2014, October). *The use of Dialectical Behavior Therapy skills in a clinical sample: Initial findings on the Italian version of the DBT Ways of Coping Checklist*. Third Congress on Borderline Personality Ddisorder and Allied Disorders, Roma, Italy.

Sansoni, J., De Caro, W., Marucci, A. N. N. A., Sorrentino, M., Mayner, L., & Lancia, L. (2016). Nurses' job satisfaction: An Italian study. *Annali di Igiene Medicina Preventiva e di Comunità*, *28*(1), 58-69. https://doi.org/10.7416/ai.2016,2085

Shaw, Y., Bradley, M., Zhang, C., Dominique, A., Michaud, K., McDonald, D., & Simon, T. A. (2020). Development of resilience among rheumatoid arthritis patients: A qualitative study. *Arthritis Care & Research*, *72*(9), 1257-1265. https://doi.org/10.1002/acr.24024

Sirigatti, S., & Stefanile, C. (2009). *CISS Coping Inventory for stressful situation. Standardizzazione e validazione italiana* [CISS Coping Inventory for stressful situation. Italian standardization and validation]. Giunti.

Skinner, E. A., Edge, K., Altman, J., & Sherwood, H. (2003). Searching for the structure of coping: A review and critique of category systems for classifying ways of coping. *Psychological Bulletin*, *129*(2), 216-269. https://doi.org/10.1037/0033-2909.129.2.216

Skinner, E. A., & Zimmer-Gembeck, M. J. (2007). The development of coping. *Annual Review of Psychology*, *58*, 119-144. https://doi.org/10.1146/annurev.psych.58.110405.085705

Su, X-Y., Lau, J. T. F., Mak, W. W. S., Choi, K. C., Feng, T-J., Chen, X., Liu, C-L., Liu, J., Liu, D., Chen, L., Song, J-M., Zhang, Y., Zhao, G-L., Zhu, Z-P., & Cheng, J-Q. (2015). A preliminary validation of the Brief COPE instrument for assessing coping strategies among people living with HIV in China. *Infectious Diseases of Poverty*, *4*, 1-10.

Thurstone, L. L. (1947). *Multiple-factor analysis: A development and expansion of The Vectors of Mind*. University of Chicago Press.

Vitaliano, P. P., Russo, J., Carr, J. E., Maiuro, R. D., & Becker, J. (1985). The ways of coping checklist: Revision and psychometric properties. *Multivariate Behavioral Research*, *20*(1), 3-26. https://doi.org/10.1207/s15327906mbr2001_1

Zurlo, M. C., Vallone, F., & Smith, A. P. (2018). Effects of individual differences and job characteristics on the psychological health of Italian nurses. *Europe's Journal of Psychology*, *14*(1), 159-175. https://doi.org/10.5964%2Fejop.v14i1.1478