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General

Brief Coping Scale TCS-9: Optimising the Assessment of Coping Strategies. The case of Health Care Workers.

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Background

The COVID-19 pandemic has intensified the focus on mental health, particularly on the coping strategies of healthcare workers who have faced unparalleled stress due to their pivotal role in addressing health disparities and determinants of health. Constantly operating in high-risk environments and managing the surge of critically ill patients, these professionals' psychological resilience has been sternly tested, necessitating robust assessment tools.

Aim

This study aims to refine the extensive 54-item Toulouse Coping Scale into a more pragmatic and less time-consuming instrument while preserving its statistical integrity, to support the mental well-being of healthcare workers.

Setting

The setting for this study was amongst healthcare workers in Greece, during the COVID-19 pandemic, a period marked by significant psychological demands on medical staff.

Methods

We conducted an unbiased exploratory factor analysis on the Toulouse Coping Scale's 54 items, drawing from a sample of 144 healthcare workers, adhering to strict methodological criteria.

Results

Data completeness was achieved across the sample, which comprised 40 (28%) males and 104 (72%) females, predominantly aged between 31 and 50 years. The final instrument, encapsulating two domains with a total of nine questions, demonstrated strong internal consistency, with an eigenvalue of 3.438 for the first domain and 1.478 for the second, validated by a scree plot.

Conclusion

The streamlined TCS-9 scale facilitates a more rapid assessment of coping strategies while reducing redundancy. The two-domain structure ensures that the revised scale retains the original's thoroughness in a more concise form.

Contribution

By enabling quicker and more efficient evaluations, the TCS-9 enhances the practicality of assessing coping mechanisms in healthcare settings, thereby contributing to the sustenance of health systems and the promotion of health equity.

INTRODUCTION

In the context of the COVID-19 pandemic, the need to assess and support the coping strategies of health care workers has become prominent as hospitals have reoriented to address health disparities and broad determinants of health.[1] These professionals, who are the primary medical responders during such crises, have experienced unprece-

dented stress and strain.[2] Their constant exposure to high-risk environments, coupled with the emotional impact of treating large numbers of critically ill patients, necessitates a systemic approach to assessing and strengthening their psychological resilience.

Focusing on health workers' coping strategies is critical not only for their own health, but also for the sustainability of health systems.[3] Adequate support mechanisms must be in place to ensure that these workers can maintain their mental well-being amid such challenges.[4] This includes providing access to mental health services, establishing peer support networks, and ensuring that work environments are supportive of emotional health. Assessment of coping strategies is critical to tailoring these support systems to be as effective as possible.

Therefore, as hospitals continue to adapt to better serve their communities and strive for health equity, the mental health of their employees must remain a top priority.[5] By engaging in active assessment and treatment of healthcare workers' coping strategies, hospitals can safeguard the health of their workforce and, in turn, the quality of care provided to patients.

Within the realm of psychiatry and mental health, the emphasis on coping strategies has seen a remarkable surge. These tactics play a crucial role as individuals, including patients, journey through a labyrinth of psychiatric and psychological challenges.[6,7] Such acknowledgment does more than just underline their importance; it reveals the dynamic equilibrium between the ever-evolving psychological stressors birthed by changing circumstances and the adaptive coping mechanisms individuals employ.[7] In this context, the COVID-19 pandemic stands as a stark testament to the resilience and coping capacity of humanity. As the health crisis escalated, it was not just the general population, but specifically healthcare professionals who felt its immense weight. Despite their clinical prowess, they grappled with unprecedented personal and professional trials — from relentless shifts to resource shortages, compounded by the looming specter of their own health risks.[8,9]

Coping serves as a vital link, seamlessly connecting external adversities to an individual's internal emotional world. These strategies, therefore, are not just reactive responses but essential tools that dictate one's psychological well-being in our complex, ever-changing world. Understanding them in-depth becomes not just relevant, but vital. Throughout the pandemic, the importance of effective coping became increasingly evident, with coping strategies acting as a primary determinant of mental well-being amidst the prevailing adversities.[10]

Coping techniques, first introduced by experts Lazarus & Folkman[7] are essential methods that profoundly impact an individual's psychological and cognitive health. Their significance becomes more pronounced in the realms of mental health issues, communication problems, and neurological disorders.[11] Bridging the gap between academic research and real-world application, coping techniques have become a focus across various disciplines, playing a crucial role in clinical and neuropsychology.[12] Beyond just emotional management, these methods promote cognitive flexibility, encourage emotional strength, and provide practical ways to tackle life's difficulties.[13]

Coping techniques offer more than just stress relief; they have wide-ranging applications across various fields.[14] Not only do they alleviate mental strains, but they also have a positive impact on medical results and job satisfaction across different professions.

Coping methods operate on personal, social, and organisational levels, all of which are pivotal for resilience and handling stress.[7,11,15] At an individual level, strategies encompass both problem-solving oriented and emotion-focused approaches.[16] Such tools assist individuals in managing emotions, reducing unease, and uplifting their general well-being. Socially, the stress is on building solid ties with family, friends, or support circles.[5,6,9,17,18]

From an organisational viewpoint, techniques rely on company practices and projects. Examples include office mental health initiatives, ensuring mental health care accessibility, and fostering welcoming and inclusive work atmospheres.[4,10,19] It is essential to recognise that coping methods must be flexible. Since the needs of individuals and groups differ, methods should be personalised, taking into account cultural, societal, and situational aspects.[20] Upcoming studies should further explore how these techniques work.[21]

Having a strong social network is essential, consistently proving its value in supporting people during tough times and improving mental health results.[22]

To understand and quantify these coping strategies, various instruments have been developed over the years including the COPE inventory[23] and the Ways of Coping Questionnaire,[24] which have been introduced to navigate the multifaceted nature of coping strategies.[25,26] Indicatively, we mention here eight coping strategies which are identified by the Ways of Coping Checklist identifies: Confrontive Coping, Distancing, Self-Controlling, Seeking Social Support, Accepting Responsibility, Escape-Avoidance, Planful Problem Solving, and Positive Reappraisal. These tools delineate a range of coping reactions, from acknowledging the situation's reality and one's place within it, to actively addressing stress sources. They encompass strategies such as proactive coping, avoidance, denial, detachment,[27] seeing stressors in an optimistic or developmental perspective, controlling emotions, using substances for emotional numbing, curbing conflicting activities, seeking religious solace, employing humour, and expressing emotions.[28,29]

The above mentioned tools offer consistent methods to assess coping approaches, allowing for evaluations across individuals and diverse groups. The COPE inventory, for example, classifies coping behaviours as problem-driven (e.g., hands-on problem resolution) or emotion-driven (e.g., pursuing emotional relief). Meanwhile, the Ways of Coping Questionnaire examines methods such as direct coping (proactively tackling an issue) and distancing (emotionally detaching from a situation).[26]

Among them, the Toulouse Coping Scale, introduced in 1995, stands as a comprehensive tool. However, its applicability in the high-stress context of the pandemic, especially

among healthcare professionals, is a matter of investigation given its extensive 54-item structure.[30]

The Toulouse Scale for Coping, explores different coping mechanisms by categorising them into six distinct strategies: Focus, Social Support, Withdrawal, Change of Attitude, Control, and Denial. Each strategy is further examined through three dimensions: Action, Information, and Emotion. The coping styles are classified as either Positive or Negative, and an overall coping score is calculated. As described by Esparbès, Tap, and Sordes, these strategies are defined in a specific conceptual framework. This tool, having undergone successful translations and validations in Italian, Spanish, and Portuguese, was selected for its psychodynamic focus and comprehensive approach.[31-34] This scale has been translated in Greek and used in greek population by Theodoratou [35] Its effectiveness has been demonstrated across various research cohorts within the Greek demographic, establishing its reliability via internal consistency evaluations. The scale's wide acceptance in academic and clinical settings is a testament to its reliability, further evidenced by its high internal consistency (Cronbach α coefficient approximating 0.8). Numerous studies have leveraged this tool to gain insights into the coping mechanisms of individuals across varying stress scenarios.[36-38]

However, while the Toulouse Coping Scale stands as a robust instrument, its application is not without challenges. A primary concern is the time-intensive nature of its administration, owing to its 54-item structure. This becomes especially pertinent when dealing with individuals already grappling with significant stressors. Furthermore, a close inspection suggests potential redundancies within the scale. Most importantly, since its inception, there has not been a comprehensive review analysing the internal consistency of items within its three domains.

With these assessments, experts can deeply comprehend the coping tactics that reinforce resilience and stress control. It is also essential to identify strategies that might be less effective or even detrimental. Such discoveries are crucial for developing customised therapeutic and intervention strategies.

This study, therefore, has a dual motivation. First, to navigate the broader landscape of coping assessment tools, emphasising their relevance and adaptability during the COVID-19 pandemic. Second, given the specific challenges faced by healthcare professionals, to optimise the Toulouse Coping Scale. Our goal is to create a more time-efficient instrument, while preserving its depth and accuracy, ensuring its relevance in high-stress scenarios like the current health crisis. It seeks to redesign the Toulouse Coping Scale, aiming for a more concise, yet equally effective tool, achieved through rigorous statistical methodologies.

METHODS

STUDY SAMPLE

During the recent COVID-19 pandemic, 144 healthcare workers, including medical and nursing staff and allied health professionals, based in Patras, Greece, were invited to fill in responses to the full 54-item Toulouse Coping Scale (Greek version) using a questionnaire presented via the internet.[21,35] Thus, ratings were obtained relating to how well these healthcare workers coped with the stress of working during the pandemic. Each item was rated on a five-point Likert scale, with one indicating never or not at all; two – rarely; three – sometimes; four – often; and five – very often.

STATISTICAL ANALYSES

First, the value of the Cronbach α coefficient was determined for the original 54-item Toulouse Coping Scale. An unbiased exploratory factor analysis of these 54 items was then carried out using a varimax orthogonal rotation, based on maximisation of the variance of the loadings, the minimum residual factoring method and the following five rules. First, factors were retained in the final model if, and only if, the value of the corresponding eigenvalue was greater than one. Second, each item was retained only if its uniqueness, that is, the proportion of its variance unexplained by the corresponding factor, was greater than 0.4. Third, the factor loading of each item was greater than 0.4. Fourth, one-to-many mappings were disallowed. That is, any item which mapped to more than one factor was eliminated. Fifth, one-to-none mappings were disallowed. A scree plot was produced and the final model checked against this. Finally, the value of the Cronbach α coefficient was determined for the new model and its item-factor correlations calculated.

The software used to carry out the statistical analyses and to graph the scree plot consisted of R v. 4.2.1, including the packages psych (Procedures for Psychological, Psychometric, and Personality Research), qgraph (Graph Plotting Methods, Psychometric Data Visualization and Graphical Model Estimation) and stats, as well as the IDE JASP 0.17.2.1.[39-42]

RESULTS

PARTICIPANTS

There were no missing data. Out of the 144 healthcare workers, 40 (28%) were male and 104 (72%) were female. 77% of the cohort were aged between 31 and 50 years.

ORIGINAL INSTRUMENT

The Cronbach α measure of the unidimensional reliability of the parent 54-item Toulouse Coping Scale was 0.944, with a 95% confidence interval (CI) of 0.929 to 0.956.

NEW MODEL

The final model comprised two domains containing a total of nine questions (see Table 1).

The scree plot corresponding to the final model is shown in Figure 1.

Table 1. Domains of the final model.

Domain	Eigenvalue	Cronbach α (95% CI)	Number of questions
Factor 1	3.438	0.799 (0.738 to 0.847)	4
Factor 2	1.478	0.714 (0.632 to 0.781)	5

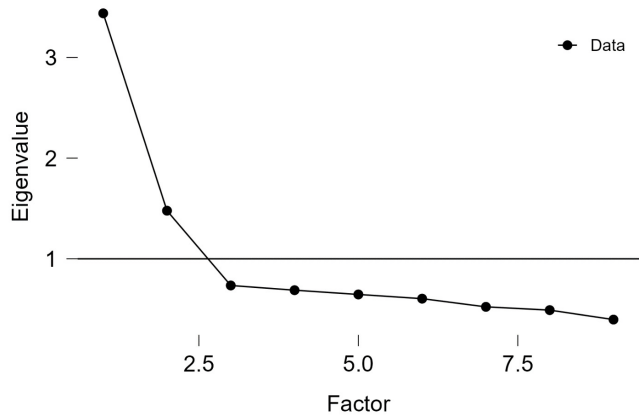

Figure 1. Scree plot of final model.

The individual items of each domain, and their correlations with the rest of the items of the corresponding domain, are detailed in Table 2.

DISCUSSION

The employment of statistical techniques has led to the creation of a much shorter, upgraded version of the original Toulouse Coping Scale. Whereas the original instrument comprises three domains (active behaviour, information processing and emotion-focused coping) and six basic coping strategy types (focus, social support, withdrawal, conversion, control and denial), thereby containing 18 subscales, with each of the latter being investigated by three items, giving a total of 54 items,[30] the new rating scale comprises two domains and a total of just nine items.

It is germane to determine how these nine items of the new instrument correspond to the original rating scale. Using the nomenclature given to the items in Table 2, for factor 1, item 1.1 belongs to the original domain of active behaviour and the focus strategy; item 1.2 to active behaviour and the control strategy; item 1.3 to emotion-focused coping and the control strategy; and item 1.4 to active behaviour and the focus strategy. Thus, factor 1 covers two of the three original domains of the Toulouse Coping Scale and indexes the focus and control strategies.

For Factor 2, items 2.1 and 2.2 both belong to active behaviour and the denial strategy; item 2.3 to emotion-focused coping and the social support strategy; item 2.4 to information processing and the social support strategy; and item 2.5 to emotion-focused coping and the conversion strategy. Thus, factor 2 covers all three original domains of the Toulouse Coping Scale and indexes the denial, withdrawal, conversion and social support strategies. Therefore, perhaps factor 1 could be named the FC factor (or just "focus & control"). Factor 2 could be the DWCS factor (or just "denial, withdrawal, conversion & social support").

It is noteworthy that none of the nine items relating to the original withdrawal strategy survived the rigorous rules applied in the formulation of the new model. It was hypothesised that the withdrawal strategy is indexed by the new scale (named TCS-9). For example, if someone avoids people (withdrawal strategy, and an item in the original scale), that person might spend more time watching television (captured by one of the nine items of the new scale). A *post hoc* analysis was therefore carried out, in which the correlations between each of the withdrawal strategy items from the original scale and the items of the TCS-9 were calculated. These correlations are shown in Table 3, from which it can be seen that this hypothesis was supported.

The revised instrument has several advantages over the Toulouse Coping Scale. First, it contains only one-sixth the number of items and therefore can be administered much more quickly than the original instrument. Even if it were to take an individual 30 seconds to respond to each item (and this is a conservative estimate), the whole instrument would take under five minutes to complete. Second, much of the redundancy of the original rating scale has been removed. Third, the items within each of the two domains of the revised instrument are internally consistent.

The choice of the name TCS-9 is based upon the fact that there are nine items in the revised instrument. It will be important for the TCS-9 to be tested in other samples and by other groups.

CONCLUSION

The quantitative assessment of coping is increasingly recognised as being important in clinical assessment and psychiatric and psychological research. The abbreviated and upgraded TCS-9 should make such assessments easier to carry out.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

Ethics approval for this study involving healthcare professionals was granted by the Hellenic Open University. The study was reviewed and approved adhering to the ethical standards of the responsible committee on human experimentation and with the Helsinki Declaration of 1975.

Informed consent was obtained from all individual participants included in the study. Before participation, all healthcare professionals were provided with detailed information about the study's aims, methodology, potential im-

pacts, and their role in the research. Consent was documented in a manner that upholds the confidentiality and autonomy of all participants.

CONSENT FOR PUBLICATION

As this study did not involve patients and no patient data was used, consent for publication is not applicable. However, all participating healthcare professionals provided their consent for the anonymised results of the study to be published in academic journals and presented at conferences. The consent process assured participants that all data would be presented in such a way that individuals could not be identified, in accordance with privacy regulations and institutional policies.

COMPETING INTERESTS

The authors declare that they have no financial or personal relationships that may have inappropriately influenced them in writing this paper.

AUTHORS' CONTRIBUTIONS

B.K.P. conceived the study, carried out the analysis and wrote the first draft. A.M. administered the questionnaires and contributed to the final draft. M.T. supervised the study, verified the analysis and contributed to the final draft.

FUNDING INFORMATION

No funding was specifically allocated for this study.

DATA AVAILABILITY

The anonymised data upon which this paper is based are available upon reasonable request from the corresponding author (M.T.).

DISCLAIMER

The views and opinions expressed in this paper are those of the authors and do not necessarily reflect the official policy or position of any affiliated agency of the authors.

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Table 2. The individual items of each domain.

Domain	Item number	Item description	Item-rest correlation
Factor 1	1.1	I am dealing with the situation. (Active focus.)	0.621
	1.2	I set goals that I need to achieve. (Cognitive control and design.)	0.618
	1.3	I control my emotions. (Emotional control.)	0.600
	1.4	I am dealing with the difficulty directly. (Active focus.)	0.611
Factor 2	2.1	I go to the cinema or watch TV to think less about the difficulty. (Withdrawal.)	0.459
	2.2	I turn to other activities to have fun. (Withdrawal.)	0.502
	2.3	I feel the need to share with my family what I feel inside. (Emotional social support.)	0.485
	2.4	I ask people who have had a similar experience what they would do. (Social information support.)	0.484
	2.5	I am looking for a philosophy of life to deal with the difficulty. (Change in values.)	0.444

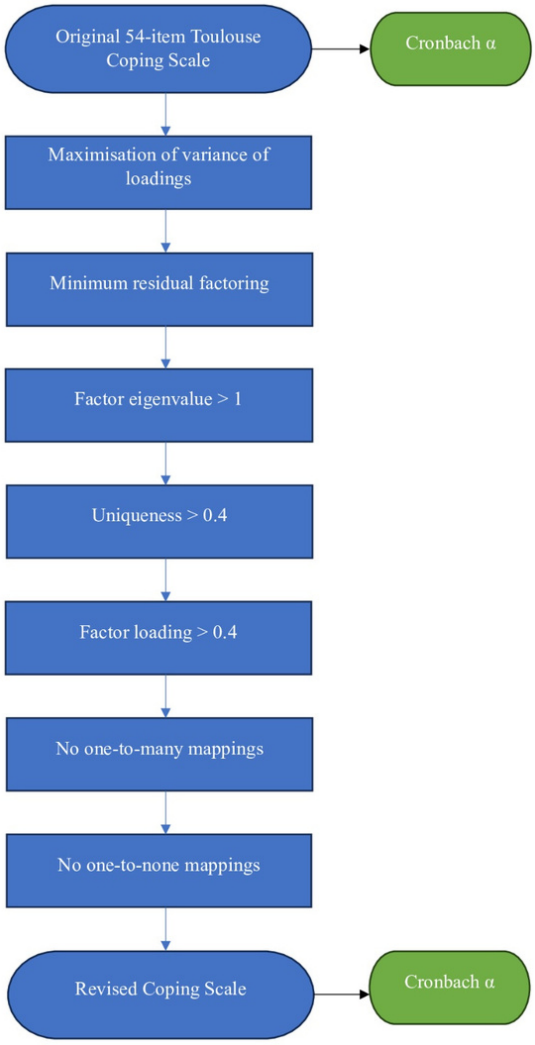

Figure 2. Flowchart

Table 3. Significant correlations (Spearman rank correlation coefficients) between items of the withdrawal coping strategy of the original Toulouse Coping Scale and the items of the TCS-9. The nomenclature of Table 2 is used for the TCS-9 items.

Withdrawal strategy items	TCS-9								
	1.1	1.2	1.3	1.4	2.1	2.2	2.3	2.4	2.5
Avoid meeting people					0.195 $p = 0.019$	0.204 $p = 0.014$		0.259 $p = 0.002$	0.234 $p = 0.005$
Do not do what I had decided to do					0.377 $p < 0.0001$	0.252 $p = 0.002$	0.233 $p = 0.005$	0.344 $p < 0.0001$	0.408 $p < 0.0001$
Distance myself from others					0.194 $p = 0.020$				0.230 $p = 0.005$
Try not to think about the difficulty	0.359 $p < 0.0001$	0.339 $p < 0.0001$			0.276 $p < 0.001$	0.391 $p < 0.0001$	0.275 $p < 0.001$	0.335 $p < 0.0001$	0.352 $p < 0.0001$
Resort to fantasy or dreams		0.177 $p = 0.034$			0.258 $p = 0.002$	0.199 $p = 0.017$	0.242 $p = 0.004$	0.345 $p < 0.0001$	0.711 $p < 0.0001$
Try in every way to think of other things	0.265 $p = 0.001$	0.274 $p < 0.001$	0.229 $p = 0.006$	0.309 $p < 0.001$	0.509 $p < 0.0001$	0.516 $p < 0.0001$	0.409 $p < 0.0001$	0.341 $p < 0.0001$	0.412 $p < 0.0001$
Resort to eating food to feel better					0.208 $p = 0.012$			0.228 $p = 0.006$	0.387 $p < 0.0001$
Forget my problems by taking medication	-0.184 $p = 0.027$	-2.40 $p = 0.004$	-0.183 $p = 0.028$		0.174 $p = 0.037$				
Smoke or take medication to calm my anxiety		-0.200 $p = 0.016$	-0.183 $p = 0.028$		0.285 $p < 0.001$				

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