

Validation of a Crisis Management Training Model Based on Reducing Air Traffic Control Challenges in Iran

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E d i t o r	R e v i e w e r s
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1. Round 1

1.1. Reviewer 1

Reviewer:

The paragraph containing the sentence “A crisis management training model for air traffic control must consequently reflect the multidimensional nature of the operational environment rather than focus exclusively on isolated emergency procedures” makes an important theoretical claim, but the manuscript does not provide a sufficiently explicit conceptual definition of “crisis management training.” The authors should define this construct operationally and distinguish it from emergency response training, safety training, resilience training, recurrent air traffic controller training, and disaster-management education. This is particularly important because the final model incorporates domains ranging from cybersecurity to occupational psychology and strategic management. Without a precise conceptual boundary, the model risks appearing excessively broad. A concise definition based on the literature and an explanation of the construct’s intended scope would strengthen theoretical coherence.

In the Introduction, the paragraph stating that “The available literature remains distributed across distinct fields such as aviation safety, traffic optimization, digital technologies, disaster management, organizational resilience, and human factors” identifies the research gap, but this gap should be made more systematic and evidence-based. The manuscript should explain

exactly what previous models or frameworks fail to include and why an additional model is required. For example, the authors should indicate whether previous studies have omitted integrated consideration of operational preparedness, leadership, emerging technologies, continuous learning, and rapid response, or whether the primary gap concerns the absence of a validated model in the Iranian air traffic control context. The present formulation is plausible but still relatively general; a sharper gap statement would make the contribution of the study more defensible.

The final sentence of the Introduction states, “Accordingly, the aim of this study was to validate a crisis management training model based on reducing air traffic control challenges in Iran.” This aim should be aligned more precisely with the actual methodology. The Methods indicate that the questionnaire was “developed on the basis of findings obtained from the preceding qualitative interviews,” suggesting that the study reported here represents a quantitative validation phase of a larger mixed-method or sequential exploratory project. The authors should clarify whether the present article reports only the quantitative validation phase or both model development and validation. If the qualitative phase is part of the same study, its design, participants, analytical procedure, and model-development process must be summarized. If it was conducted previously and is outside the scope of the current article, that should be stated explicitly.

The Data Analysis paragraph states that “The principal inferential analytical procedure was structural equation modeling (SEM),” but the manuscript should provide a much more reproducible description of the estimation procedure. Please specify the AMOS version, estimation method—presumably maximum likelihood—the treatment of missing data, screening for multivariate outliers, assessment of multivariate normality, and whether covariance or correlation matrices were analyzed. It should also be clarified whether the reported model is a first-order CFA, second-order CFA, or full structural model. The figure appears to represent a higher-order measurement structure in which 19 components load onto five dimensions and the five dimensions load onto an overarching crisis-management training construct. This hierarchical structure should be explicitly specified in the Methods.

In the Findings section, the paragraph interpreting the Kolmogorov–Smirnov test states that “the significance levels for all components were greater than .05. Therefore, the null hypothesis of normality was not rejected for any component.” This result warrants careful reconsideration because the reported K–S statistics and p-values appear unusual for a sample of 203, particularly values such as $K-S = 0.345$ with $p = .701$. The authors should verify the statistical output and ensure that the correct test statistic and significance values have been transcribed. Moreover, SEM assumptions should not be based solely on univariate K–S tests. The authors should additionally report skewness, kurtosis, multivariate normality, and potentially Mardia’s coefficient or another appropriate measure. If multivariate normality is violated, robust estimation or bootstrapping should be considered.

Authors revised the manuscript and uploaded the new document.

1.2. Reviewer 2

Reviewer:

In the Methods and Materials section, the sentence “This study was applied in terms of its purpose and employed a quantitative research approach” is too generic for an international scientific manuscript. The study design should be described using standard methodological terminology, such as a cross-sectional quantitative validation study employing confirmatory factor analysis and structural equation modeling. The phrase “applied in terms of its purpose” is common in some local research traditions but adds little methodological information for an international readership. More importantly, the authors should specify the period during which data were collected, the organizational setting, eligibility criteria, exclusion criteria, and whether participants were licensed operational air traffic controllers, supervisors, or other air traffic management personnel.

The participant description states that the population included “430 air traffic control personnel,” comprising 100 from Mehrabad Airport Control Tower, 100 from Tehran Approach Control Unit, and 230 from the national Area Control Center. The manuscript should report how the 203 sampled participants were allocated across these three strata. Because stratified random sampling is claimed, readers need to know whether proportional allocation was used and how many individuals were

ultimately recruited from each unit. The authors should also report the response rate, number of questionnaires distributed, number returned, number excluded because of missing or invalid data, and final analyzable sample. These details are necessary to evaluate potential nonresponse bias and the integrity of the sampling procedure.

The Methods section states, “The required sample size was determined using Cochran’s sample size formula, resulting in a final sample of 203 participants.” This justification is not fully adequate for a structural equation modeling study. Cochran’s formula addresses survey sampling but does not establish whether the sample is sufficient for confirmatory factor analysis or SEM. Because the proposed instrument contains approximately 90 indicators and 19 first-order components, the authors should provide a model-specific sample-size justification based on parameter-to-sample ratios, anticipated effect size, statistical power, or Monte Carlo/power analysis. The later statement that “the statistical power of the model reached 1.00” should also be accompanied by a transparent description of the software, assumptions, effect size, alpha level, degrees of freedom, and procedure used to derive this value.

The Data Collection Tools section notes that the questionnaire was developed “on the basis of findings obtained from the preceding qualitative interviews,” yet the manuscript does not provide sufficient information about item generation. The authors should report the initial number of items, the process by which interview-derived codes or categories were converted into questionnaire items, the number of items removed or revised, the number of experts involved in review, and the final number of items assigned to each component. Table 1 suggests that most components contain five indicators and some contain four, but the manuscript should explicitly state the total questionnaire length and provide at least representative items or indicate that the full instrument is available as supplementary material.

The statement “The validity of the questionnaire was examined through face, content, and construct validity procedures” requires substantial methodological clarification. Face validity should not be presented as equivalent to formal psychometric validity, and content validity should ideally be supported by recognized indices such as the Content Validity Ratio (CVR) and Content Validity Index (CVI), including the number and qualifications of expert raters. More importantly, the manuscript currently states that “content and construct validity were subsequently assessed” using AVE and CR; however, AVE is generally used to assess convergent validity, while CR primarily evaluates construct reliability rather than content validity. The terminology should therefore be corrected, and the authors should separate face validity, content validity, convergent validity, discriminant validity, and internal consistency reliability conceptually and statistically.

Authors revised the manuscript and uploaded the new document.

2. Revised

Editor’s decision after revisions: Accepted.

Editor in Chief’s decision: Accepted.