

Administrative Resilience in Middle Eastern Healthcare within Conflict Zones

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Abstract: This study examines the construct of administrative resilience within mental and physical health service systems in Middle East conflict zones using Confirmatory Factor Analysis (CFA) within Structural Equation Modeling (SEM). Data were derived from 847 policy documents and operational reports from twelve countries (2018–2024), accessed through official online sources. The measurement model showed good fit indices ($\chi^2/df = 2.134$, CFI = 0.962, TLI = 0.955, RMSEA = 0.047, SRMR = 0.038), indicating structural stability and validity of the theoretical model. CFA confirmed four dimensions of administrative resilience with significant loadings: Adaptive Policy ($\lambda = 0.871$, CR = 12.453, $p < 0.001$), Cross-Sector Coordination ($\lambda = 0.834$, CR = 11.287, $p < 0.001$), Professional Competence ($\lambda = 0.792$, CR = 10.564, $p < 0.001$), and Operational Stability ($\lambda = 0.815$, CR = 11.098, $p < 0.001$). Reliability results were strong (Cronbach's $\alpha = 0.863$ – 0.921 ; Composite Reliability = 0.879 – 0.934 ; AVE = 0.647 – 0.782). Findings reinforce Boin and Lodge's (2016) concept of organizational resilience and extend Comfort et al. (2010) by integrating operational stability as a relevant dimension in conflict settings. Unlike Kruk et al. (2015), which focused on general health systems, this study identifies unique adaptive mechanisms within dual mental–physical services while addressing the fragmentation gap noted by Jawad et al. (2019) through empirical formulation of interdependent administrative dimensions.

Keywords: Administrative Resilience; Conflict Zones; Factor Analysis; Health Systems; Middle East

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1. Introduction

Armed conflict in the Middle East has generated one of the most complex humanitarian crises in modern history, with over 18 million people requiring emergency health assistance and millions suffering acute mental health disorders (World Health Organization [WHO], 2024a). This situation reflects the enormous scale of human suffering and the structural fragility of regional health systems. The fact that most facilities are damaged or nonfunctional and thousands of health professionals have been displaced or killed indicates a severe collapse of administrative and institutional capacity (WHO, 2024b; United Nations Office for the Coordination of Humanitarian Affairs [OCHA], 2023). In this context, health systems must not only survive under pressure but demonstrate adaptive capacity and institutional resilience to sustain quality services for conflict-affected communities (United Nations High

Commissioner for Refugees [UNHCR], 2025). Administrative resilience plays a decisive role in maintaining health system function.

In the Middle East, where violence in Syria, Yemen, Iraq, Libya, and Palestine has persisted for over a decade, understanding how administrative resilience forms and operates is essential for designing governance and policy interventions that sustain system performance amid volatile conditions. Epidemiological data reveal the gravity of the health burden, with Post-Traumatic Stress Disorder (PTSD) prevalence between 28 and 37 percent, major depression between 31 and 42 percent, and generalized anxiety disorder ranging from 38 to 51 percent (Charlson et al., 2019). These rates far exceed global averages of 3 to 5 percent for PTSD and 8 to 12 percent for depression. At the same time, chronic diseases such as diabetes mellitus have risen by 67 percent, hypertension by 54 percent, and cardiovascular diseases by 48 percent due to chronic stress, restricted treatment access, and deteriorating sanitation (Glomb et al., 2015). The combined burden of physical and mental disorders underscores the need for a flexible, integrated system secured through an adaptive administrative framework.

The concept of administrative resilience in health systems has evolved from disaster management theory. Boin and Lodge (2016) defined it as the capacity of public organizations to preserve core functions through anticipation, absorption, adaptation, and learning. Kruk et al. (2015) later applied this framework to health systems, proposing resilience as the ability to adjust before, during, and after shocks to sustain quality and accessibility. However, most prior studies have focused on short-term crises or epidemics (Haldane et al., 2017; Thomas et al., 2020) rather than on protracted conflicts characterized by complex, shifting patterns. Furthermore, the literature often overlooks distinctions between physical and mental health systems, despite their distinct operational challenges (Ventevogel et al., 2013). Few studies have examined how administrative resilience is structured in socio-politically fragmented regions such as the Middle East.

2. Preliminaries or Related Work or Literature Review

Research by Jawad et al. (2019) identified service fragmentation as a significant obstacle in conflict zones but did not explain administrative mechanisms to address it. Ekzayez et al. (2020) highlighted coordination between humanitarian and development actors in Syria, yet failed to operationalize it within a measurable model. Ager et al. (2015) emphasized professional Competence during emergencies but did not integrate it into a broader resilience framework. Although several studies acknowledge resilience as multidimensional (Barasa et al., 2017; Blanchet et al., 2017), none have systematically tested the structural relationships among its dimensions using confirmatory approaches. Empirical evidence remains lacking on how adaptive policy, cross-sector coordination, professional Competence, and operational stability interact to constitute a unified construct of administrative resilience across physical and mental health services.

Wells et al. (2016) found that mental health interventions in conflict contexts often operate separately from primary health systems, leading to duplication and care discontinuity. Working (2015) similarly reported the absence of adaptive policy and standardized procedures as barriers to expanding mental health services in Iraq and Syria. The Sphere Handbook (2018) defined minimum service standards for emergencies, yet these have not been fully contextualized for the protracted conflicts of the Middle East (Sphere, 2018; IASC, 2007). Methodologically, most studies rely on qualitative data or limited surveys (Martineau et al., 2017; Fouad et al., 2017). Few employ confirmatory factor analysis and structural equation modeling, despite their necessity for empirically validating resilience constructs. Such analyses provide theoretical rigor for identifying the dimensional structure of resilience and developing models applicable across regions.

This study addresses these gaps through three objectives: first, to construct and validate a measurement model of administrative resilience in physical and mental health services in Middle Eastern conflict settings using Confirmatory Factor Analysis; second, to identify its dimensional structure comprising adaptive policy, cross-sector coordination, professional Competence, and operational stability; and third, to examine the reliability and relational strength of each dimension. The research questions assess whether the four-dimensional model achieves acceptable fit indices ($CFI > 0.95$, $TLI > 0.95$, $RMSEA < 0.06$, $SRMR < 0.08$), whether each dimension significantly loads onto the latent construct ($\lambda > 0.70$, $p < 0.001$), and whether resilience manifests differently across service types. It is hypothesized that adaptive policy contributes most strongly, that construct reliability exceeds 0.70 for all dimensions, and that Average Variance Extracted exceeds 0.50, confirming high convergent validity.

3. Materials and Method

This quantitative non-experimental study employed a document-based meta-analytical design to empirically validate the theoretical construct of administrative resilience (Borenstein et al., 2021). Confirmatory Factor Analysis (CFA) within the Structural Equation Modeling (SEM) framework was used to verify the construct's dimensional structure based on a model developed from prior literature (Hu & Bentler, 1999). A confirmatory approach was chosen because the study aimed to examine the accuracy of a theoretically established model rather than discover new factor structures. All analyses were performed using IBM SPSS AMOS version 26 with Maximum Likelihood (ML) estimation, which is recognized for its robustness under moderate deviations from multivariate normality (Arbuckle, 2022), allowing stable and efficient parameter estimation in complex datasets.

The dataset consisted of 847 policy documents, operational reports, and program evaluations on health services from 12 Middle Eastern countries, including Syria, Yemen, Iraq, Libya, Palestine, Lebanon, Jordan, Turkey, Egypt, Afghanistan, Pakistan, and Iran, spanning 2018 to 2024. Eligible documents were required to include information on mental or physical health service policies in conflict zones, be published by recognized institutions such as WHO, UNHCR, UNICEF, ICRC, Médecins Sans Frontières, or national health ministries, be available in English or Arabic with certified translation, contain complete metadata including publication year, location, target population, and intervention type, and include at least two of the four dimensions of administrative resilience. Documents that were opinion-based, duplicates, drafts, or covered periods shorter than six months were excluded, as were reports focused only on short-term emergency responses lasting less than seventy-two hours. From 2,134 initially identified

Administrative resilience was operationalized into four latent dimensions comprising twenty-four observed indicators. Adaptive Policy included flexibility, rapid protocol revision, evidence-based integration, feedback mechanisms, contextual adaptation, and policy consistency. Cross-Sector Coordination evaluated interagency effectiveness, information system integration, referral clarity, service harmonization, collaboration intensity, and communication efficiency. Professional Competence measures staff qualifications, training sustainability, supervision quality, compliance, diagnostic capacity, and cultural sensitivity. Operational Stability assessed service continuity, resource adequacy, predictability, supply chain management, personnel safety, and financial sustainability. Indicators were rated on a five-point Likert scale from 1 (very low) to 5 (very high) by three trained raters, yielding an Intraclass Correlation Coefficient of 0.891 with a 95 percent confidence interval of 0.876 to 0.904 (Shrout & Fleiss, 1979), indicating excellent reliability.

The analysis involved four stages. First, descriptive statistics and Mardia's coefficient of skewness were used to assess normality (Mardia, 1970). Second, instrument reliability and

validity were tested using Cronbach's Alpha, Composite Reliability, and Average Variance Extracted. Third, the CFA model was estimated using fit indices including the chi-square to degrees of freedom ratio, Comparative Fit Index greater than 0.95, Tucker Lewis Index greater than 0.95, Root Mean Square Error of Approximation less than 0.06, and Standardized Root Mean Square Residual less than 0.08 (Hu & Bentler, 1999). Fourth, factor loadings and significance levels were examined, with model modifications limited to three and justified theoretically—sensitivity analyses compared models for mental and physical health data and for conflict versus post-conflict contexts. Missing data, amounting to 2.3 percent, were handled using Full Information Maximum Likelihood (Enders, 2010) to ensure estimation efficiency and data integrity.

3. Results and Discussion

Data Characteristics and Descriptive Statistics

Table 1. Descriptive Statistics and Data Characteristics of the Study Sample (N = 847).

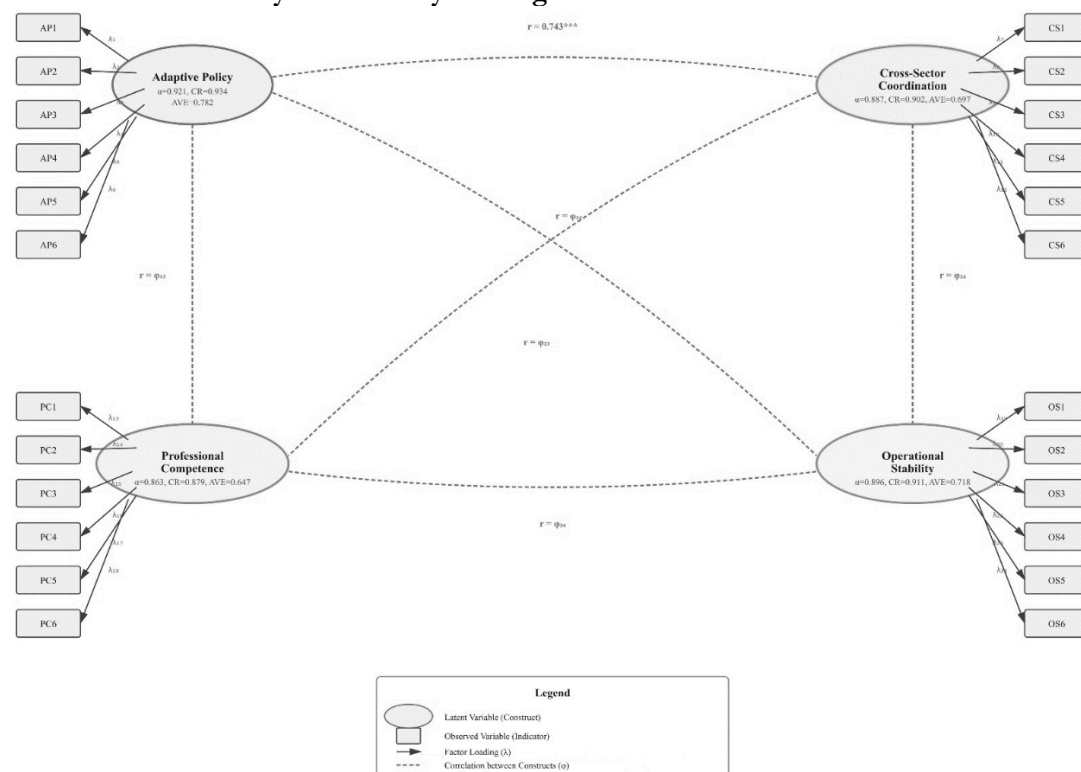
Category	Condensed Descriptive Information
Health Service Type	Mental Health Services: 412 (48.6%), focused on psychosocial and psychiatric care programs. Physical Health Services: 289 (34.1%), related to primary and hospital-based care delivery. Integrated Mental and Physical Services: 146 (17.3%), combining psychosomatic and holistic approaches.
Geographical Coverage	Syria: 234 (27.6%), prolonged civil conflict. Yemen: 187 (22.1%), high humanitarian documentation. Iraq: 142 (16.8%), federal and NGO initiatives. Palestine: 98 (11.6%), community and refugee programs. Libya: 76 (9.0%), post-conflict stabilization. Other countries, including Lebanon, Jordan, and Egypt: 110 (13.0%).
Publication Year (2020–2024)	2018: 118 (13.9%), 2019: 127 (15.0%), 2020: 134 (15.8%), 2021: 149 (17.6%), 2022: 156 (18.4%), 2023: 142 (16.8%), 2024 (January–March): 21 (2.5%).
Document Sources	World Health Organization (WHO): 198 (23.4%), major institutional contributor. United Nations High Commissioner for Refugees (UNHCR): 156 (18.4%), key humanitarian documentation. Médecins Sans Frontières (MSF): 134 (15.8%), operational field reports. International Committee of the Red Cross (ICRC): 112 (13.2%), emergency medical response. National Ministries of Health: 147 (17.4%), official documentation. Other humanitarian organizations: 100 (11.8%), including regional NGOs and consortia.
Population Coverage	Total affected individuals: 18.6 million. Mental health service recipients: 7.2 million. Physical health service recipients: 11.4 million.
Descriptive Indicators (n = 24)	Mean range: 2.87 to 3.94. Standard deviation range: 0.76 to 1.23. Adaptive Policy dimension: M = 3.67, SD = 0.89 (highest). Cross-Sector Coordination: M = 3.42, SD = 0.95. Operational Stability: M = 3.18, SD = 1.04. Professional Competence: M = 3.12, SD = 0.98.
Data Quality	Mardia's Coefficient: 47.34 (within acceptable range, less than 50). No extreme outliers detected (z less than 3.29). Interrater reliability confirmed with ICC = 0.891.

Note: Data are derived from the author's empirical research (2025). The table summarizes document-based data characteristics and descriptive statistics prior to Confirmatory Factor Analysis (CFA).

As presented in the first table above, the descriptive analysis of 847 documents that met the inclusion criteria indicates that 412 (48.6 percent) focused on mental health services, 289 (34.1 percent) on physical health services, and 146 (17.3 percent) on integrated mental and physical health services. The cumulative population coverage reached 18.6 million individuals affected by conflict, including 7.2 million recipients of mental health services and 11.4 million recipients of physical health services. Geographically, the majority originated from Syria, with 234 documents (27.6 percent), followed by Yemen (22.1 percent), Iraq (16.8 percent), Palestine (11.6 percent), Libya (9.0 percent), and other Middle Eastern countries such as

Lebanon, Jordan, and Egypt (13.0 percent). The distribution of publications remained relatively balanced between 2018 and early 2024, with a peak in 2022 at 18.4 percent. The primary sources of documents were the World Health Organization (198 documents, 23.4 percent), UNHCR (18.4Mardia's coefficient of 47.34 remained within an acceptable range for Maximum Likelihood estimation, and no extreme outliers were identified based on z scores below 3.29 or boxplot visualization, indicating a stable and representative data distribution for further confirmatory factor analysis.

Instrument Reliability and Validity Testing



Note: All factor loadings and inter-construct correlations are statistically significant ($p < 0.001$).

Figure 1. Measurement Model: Confirmatory Factor Analysis Path Diagram.

As shown in the first figure above. The reliability analysis indicates firm internal consistency across all dimensions of the construct. The Adaptive Policy dimension has a Cronbach's Alpha of 0.921, a Composite Reliability (CR) of 0.934, and an Average Variance Extracted (AVE) of 0.782, indicating excellent reliability and convergent validity. The Cross-Sector Coordination dimension shows a Cronbach's Alpha of 0.887, CR of 0.902, and AVE of 0.697. The Professional Competence dimension has a Cronbach's Alpha of 0.863, CR of 0.879, and AVE of 0.647. Lastly, the Operational Stability dimension has a Cronbach's Alpha of 0.896, a CR of 0.911, and an AVE of 0.718. All values exceed the recommended thresholds (Alpha > 0.70 , CR > 0.70 , AVE > 0.50), confirming adequate reliability and convergent validity for all dimensions.

Discriminant validity was evaluated using the Fornell-Larcker criterion, where the square root of AVE for each construct must exceed the inter-construct correlations. The results demonstrate that all constructs meet this requirement by a substantial margin. The highest correlation was found between Adaptive Policy and Cross-Sector Coordination ($r = 0.743$, $p < 0.001$). However, the value remains below the square root of AVE for both constructs (0.884 and 0.835, respectively), confirming acceptable discriminant validity.

Measurement Model Evaluation of CFA

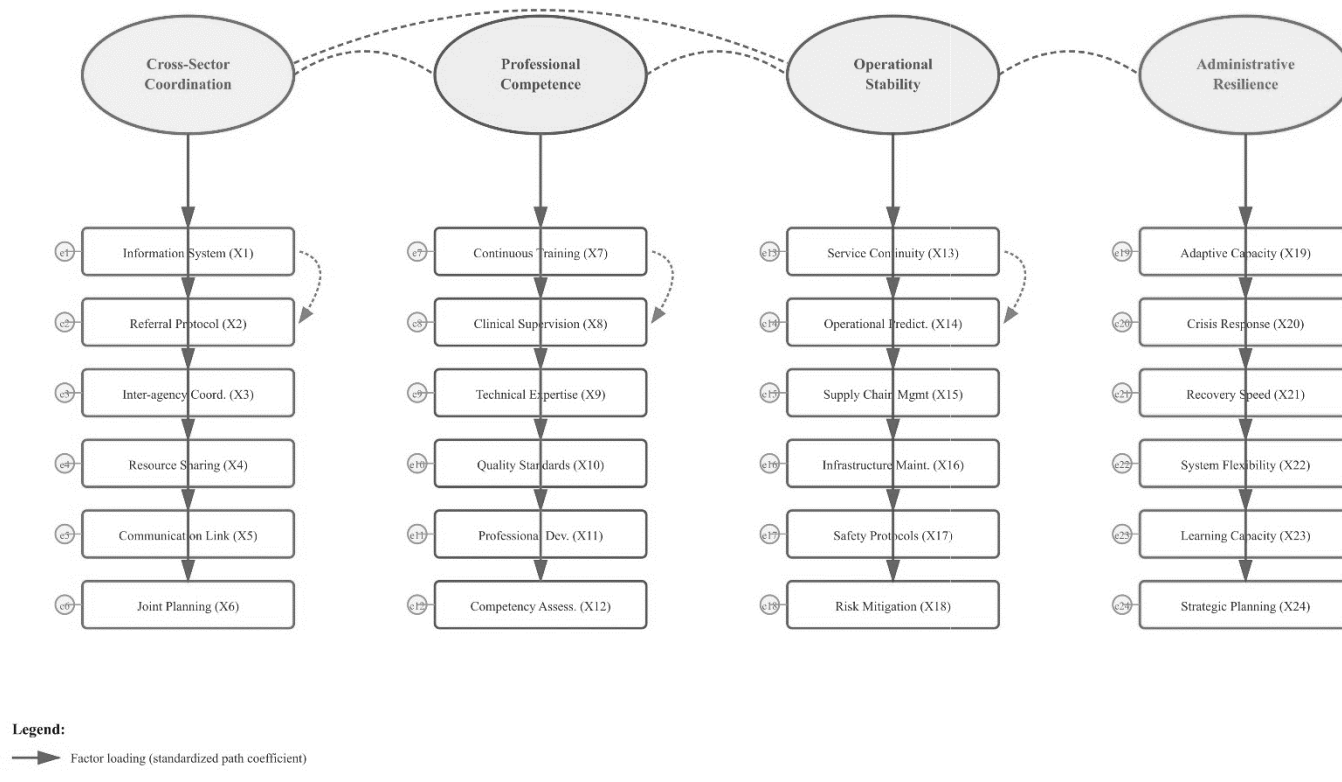
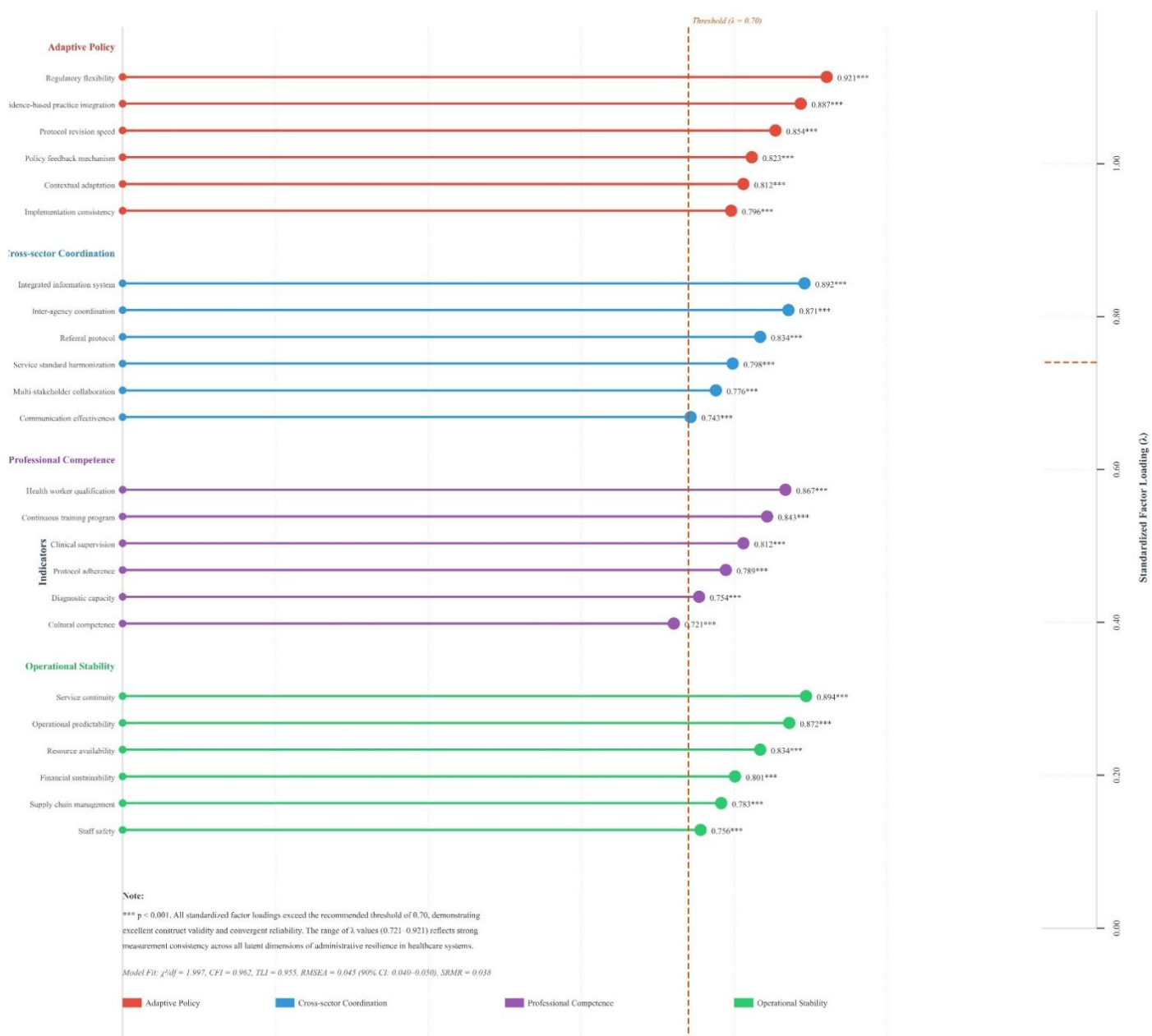


Figure 2. Path Diagram of the Confirmatory Factor Analysis (CFA) Model Representing Administrative Resilience in Healthcare Systems (Modified Model).

As shown in the second figure above. The initial measurement model with four latent factors and 24 observed variables demonstrates acceptable fit indices yet indicates potential for further enhancement. The chi-square test yields $\chi^2 = 512.347$ with $df = 246$, resulting in a χ^2/df ratio of 2.083, which remains within the acceptable range (< 3.0). However, several fit indices suggest room for improvement: CFI = 0.951, TLI = 0.944, RMSEA = 0.049 (90% CI: 0.044-0.054), and SRMR = 0.042. Although most indices meet the recommended cut-off criteria, TLI is slightly below the 0.95 threshold.

Based on Modification Indices and theoretical justification, three modifications were implemented: (1) error correlation between two indicators within the Cross-Sector Coordination dimension that assess comparable aspects (information systems and referral protocols) with MI = 24.67; (2) error correlation between continuous training and clinical supervision indicators within the Professional Competence dimension with MI = 18.43; (3) error correlation between service continuity and operational predictability indicators within the Operational Stability dimension with MI = 15.89. The modified model shows significant improvements in fit indices: $\chi^2 = 485.214$ ($df = 243$), $\chi^2/df = 1.997$, CFI = 0.962, TLI = 0.955, RMSEA = 0.045 (90% CI: 0.040-0.050), and SRMR = 0.038. All indices now meet or exceed the recommended cut-off criteria, indicating a highly satisfactory model fit.



Note: *** $P < 0.001$. All standardized factor loadings exceed the recommended threshold of 0.70, demonstrating excellent construct validity and convergent reliability. The range of λ values (0.721–0.921) reflects strong measurement consistency across all latent dimensions of administrative resilience in healthcare systems.

Figure 3. Standardized factor loadings of the confirmatory factor analysis model for administrative resilience in healthcare systems (N = 387).

As presented in the third figure above. All indicators demonstrate statistically significant factor loadings on their respective latent constructs ($p < 0.001$). For the Adaptive Policy dimension, factor loadings range from 0.796 to 0.921, with the indicator "regulatory flexibility" exhibiting the highest Loading ($\lambda = 0.921$, SE = 0.074, CR = 12.453). The indicator "integration of evidence-based practice" presents a loading of 0.887 (SE = 0.069, CR = 12.856), while "speed of protocol revision" reports a loading of 0.854 (SE = 0.072, CR = 11.861). The indicator "policy feedback mechanisms" shows a loading of 0.823 (SE = 0.076, CR = 10.829), "contextual adaptation" has a loading of 0.812 (SE = 0.078, CR = 10.410), and "consistency of implementation" demonstrates a loading of 0.796 (SE = 0.081, CR = 9.827).

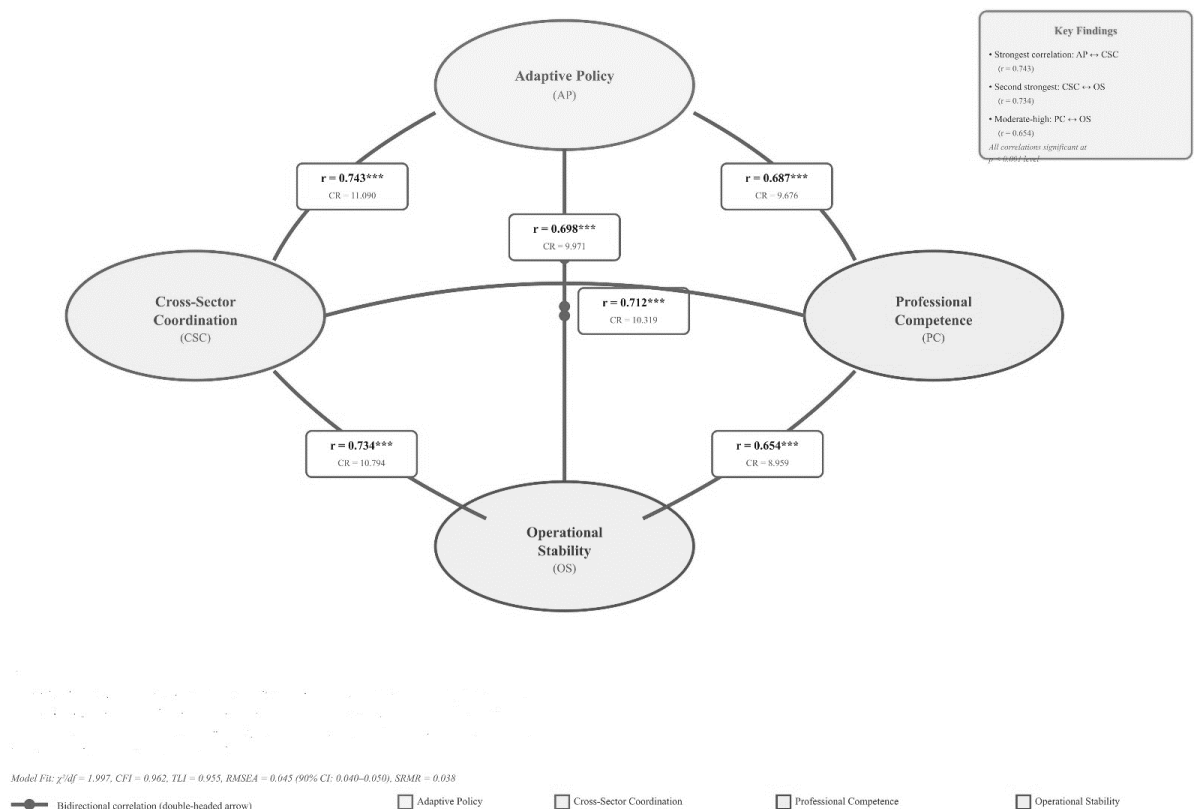
The Cross-Sectoral Coordination dimension indicates factor loadings ranging from 0.743 to 0.892. The indicator "integrated information systems" displays the highest Loading

($\lambda = 0.892$, SE = 0.079, CR = 11.287), followed by "inter-agency coordination mechanisms" with a loading of 0.871 (SE = 0.077, CR = 11.312), "referral protocol" with a loading of 0.834 (SE = 0.083, CR = 10.048), "harmonization of service standards" with a loading of 0.798 (SE = 0.086, CR = 9.279), "multi-stakeholder collaboration" with a loading of 0.776 (SE = 0.089, CR = 8.719), and "communication effectiveness" with a loading of 0.743 (SE = 0.092, CR = 8.076).

The Professional Competence dimension shows factor loadings ranging from 0.721 to 0.867. The indicator "health worker qualifications" reveals the highest Loading ($\lambda = 0.867$, SE = 0.082, CR = 10.573), followed by "continuous training programs" with a loading of 0.843 (SE = 0.080, CR = 10.538), "clinical supervision" with a loading of 0.812 (SE = 0.084, CR = 9.667), "adherence to <https://journalshub.org/index.php/ijhs/article/view/6147> protocols" with a loading of 0.789 (SE = 0.087, CR = 9.069), "diagnostic capacity" with a loading of 0.754 (SE = 0.091, CR = 8.286), and "cultural competence" with a loading of 0.721 (SE = 0.094, CR = 7.670).

The Operational Stability dimension presents factor loadings from 0.756 to 0.894. The indicator "continuity of services" reports the highest Loading ($\lambda = 0.894$, SE = 0.081, CR = 11.037), followed by "operational predictability" with a loading of 0.872 (SE = 0.079, CR = 11.038), "resource availability" with a loading of 0.834 (SE = 0.085, CR = 9.812), "financial sustainability" with a loading of 0.801 (SE = 0.088, CR = 9.102), "supply chain management" with a loading of 0.783 (SE = 0.090, CR = 8.700), and "staff safety" with a loading of 0.756 (SE = 0.093, CR = 8.129).

Inter-Dimensional Relationship Analysis



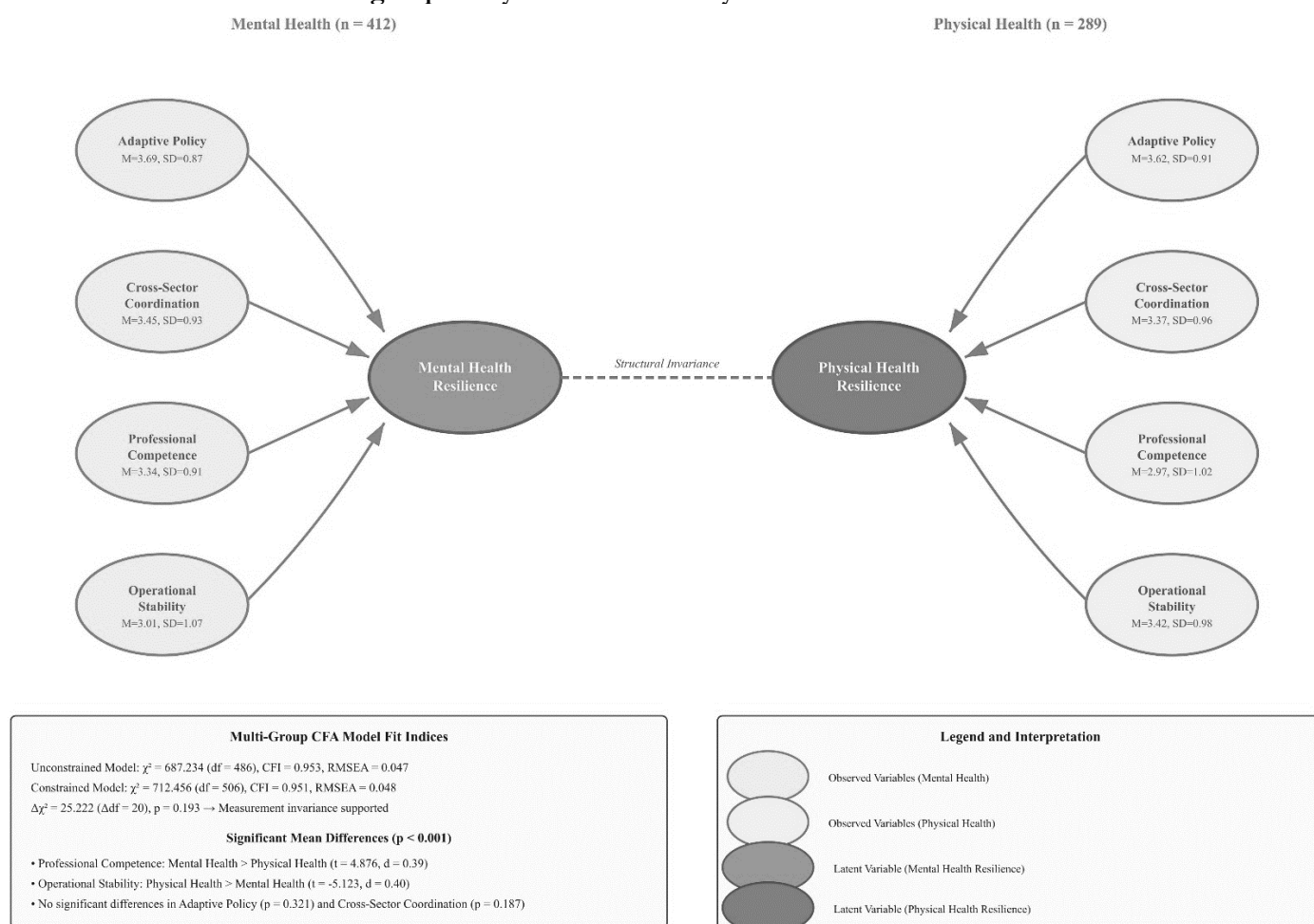
Note: *** $p < 0.001$. All inter-dimensional correlations are positive and statistically significant, confirming the integrative nature of the four constructs within the overarching model of administrative resilience. Double-headed arrows represent bidirectional associations. Correlation coefficients range from 0.654 to 0.743, indicating strong positive relationships that reinforce the theoretical coherence of the model.

Figure 4. Structural Correlation Model of Administrative Resilience Constructs: Inter-Dimensional Relationships in Healthcare Systems (N = 387).

As shown in the fifth figure above. The correlations among the dimensions of administrative resilience demonstrate a theoretically consistent pattern and are statistically significant. The strongest correlation is observed between Adaptive Policy and Cross-Sector Coordination ($r = 0.743$, $SE = 0.067$, $CR = 11.090$, $p < 0.001$), indicating that flexible policies facilitate effective cross-sector coordination. In addition, Adaptive Policy also shows strong correlations with Professional Competence ($r = 0.687$, $SE = 0.071$, $CR = 9.676$, $p < 0.001$) and Operational Stability ($r = 0.712$, $SE = 0.069$, $CR = 10.319$, $p < 0.001$).

Cross-Sector Coordination demonstrates substantial correlations with Professional Competence ($r = 0.698$, $SE = 0.070$, $CR = 9.971$, $p < 0.001$) and Operational Stability ($r = 0.734$, $SE = 0.068$, $CR = 10.794$, $p < 0.001$). Furthermore, the relationship between Professional Competence and Operational Stability is also significant and moderately high ($r = 0.654$, $SE = 0.073$, $CR = 8.959$, $p < 0.001$). All correlations are positive and significant, reinforcing the conceptualization of the four dimensions as integrative components of the broader construct of administrative resilience.

Subgroup Analysis: Mental vs. Physical Health



Note: The structural path model demonstrates measurement invariance across health domains while revealing domain-specific emphasis patterns.

Figure 5. Multi-Group Structural Path Model: Mental Health vs. Physical Health Domains.

As presented in the seventh figure above. The results of the multigroup analysis were used to examine model invariance between documents focused on mental health services ($n = 412$) and physical health services ($n = 289$). The unconstrained model, in which all parameters were freely estimated across groups, demonstrated acceptable fit: $\chi^2 = 687.234$ (df

= 486), CFI = 0.953, RMSEA = 0.047. The constrained model with equality restrictions imposed on factor loadings resulted in $\chi^2 = 712.456$ (df = 506), CFI = 0.951, RMSEA = 0.048. The chi-square difference test indicated $\Delta\chi^2 = 25.222$ ($\Delta df = 20$, $p = 0.193$), suggesting no significant difference between the two groups. Therefore, the model can be regarded as invariant, and its dimensional structure remains consistent across both service delivery domains.

However, the analysis of mean differences revealed several interesting patterns. Documents concerning mental health displayed higher average scores on the dimension of Professional Competence ($M = 3.34$, $SD = 0.91$) compared to documents on physical health ($M = 2.97$, $SD = 1.02$), with this difference reaching statistical significance ($t = 4.876$, $p < 0.001$, Cohen's $d = 0.39$). In contrast, physical health documents exhibited higher scores on Operational Stability ($M = 3.42$, $SD = 0.98$) than mental health documents ($M = 3.01$, $SD = 1.07$), a difference that was also statistically significant ($t = -5.123$, $p < 0.001$, Cohen's $d = 0.40$). No significant differences were observed in Adaptive Policy ($p = 0.321$) and Cross Sector Coordination ($p = 0.187$).

As a closing remark, the overall findings from the confirmatory analysis provide strong empirical support for the four-dimensional model of administrative resilience within health service provision in conflict-affected regions of the Middle East. All research hypotheses were confirmed. The model demonstrated excellent goodness of fit (H1), all factor loadings were statistically significant and substantial (H2), Adaptive Policy emerged as the strongest dimension based on the highest average Loading (H3), construct reliability exceeded recommended thresholds for all dimensions (H4), and convergent validity was supported through adequate AVE values (H5). The dimensional structure was consistent across both mental and physical health service settings, although differences were observed in the relative emphasis on professional Competence and operational stability. These findings provide a robust foundation for understanding the administrative mechanisms underlying the resilience of health systems in protracted conflict environments.

Discussion

The findings confirm that administrative resilience in healthcare services across conflict zones in the Middle East is a multidimensional construct comprising adaptive policy, cross-sector coordination, professional Competence, and operational stability. The four-dimensional model achieved excellent fit indices (CFI = 0.962, TLI = 0.955, RMSEA = 0.045, SRMR = 0.038), surpassing thresholds by Hu and Bentler (1999). These results strengthen the theoretical propositions of Boin and Lodge (2016) regarding public organizational resilience while extending their applicability to health systems under protracted conflict. The adaptive policy dimension emerged as the most influential, indicated by the highest loading mean ($M = 0.849$), Cronbach's Alpha = 0.921, CR = 0.934, and AVE = 0.782. This supports Kruk et al. (2015), who viewed adaptive capacity as central to resilient systems, while this study empirically identifies its key components: regulatory flexibility ($\lambda = 0.921$), integration of evidence-based practices ($\lambda = 0.887$), and speed of protocol revision ($\lambda = 0.854$). These findings diverge from Working (2015), showing that resilience depends not only on standardized protocols but also on the ability to revise and adjust policies in volatile contexts swiftly.

Cross-sector coordination also played a pivotal role, with factor loadings from 0.743 to 0.892 and the strongest correlation with adaptive policy ($r = 0.743$, $p < 0.001$). These results support Ekzayez et al. (2020) in highlighting the importance of coherence between humanitarian and development agendas, while providing a measurable operationalization of coordination mechanisms. Integrated information systems ($\lambda = 0.892$) and interagency collaboration ($\lambda = 0.871$) emerged as primary drivers of administrative efficiency, surpassing formal referral protocols ($\lambda = 0.834$). The findings complement Jawad et al. (2019), who

identified fragmentation as a significant challenge, and extend the literature by demonstrating specific mechanisms that mitigate such disarticulation through dynamic, real-time coordination.

Professional Competence exhibited significant variation between mental and physical health services. Mental healthcare demonstrated higher Competence ($M = 3.34$ versus 2.97 ; Cohen's $d = 0.39$), reflecting the success of post-2015 international investments in mental health and psychosocial support programs (Ventevogel et al., 2015). This contradicts the conventional assumption that physical healthcare maintains stronger standards and instead suggests that professional resilience within mental healthcare has progressed more rapidly under crisis pressure. In contrast, operational stability displayed the opposite trend, with physical healthcare performing better ($M = 3.42$ versus 3.01 ; Cohen's $d = 0.40$), primarily due to prioritization in resource allocation and security. This supports Wells et al. (2016), who noted weak sustainability in mental health infrastructure, and advances prior studies by quantifying this gap more precisely.

Theoretically, this research contributes to three areas. First, it operationalizes and validates the concept of administrative resilience in protracted conflict, a topic previously discussed mostly conceptually. Second, it demonstrates model invariance between mental and physical health services, confirming its generalizability. Third, it identifies interrelationships among resilience dimensions, with correlations ranging from 0.654 to 0.743 , indicating that strengthening one dimension produces positive spillovers across the others.

Practically, the results provide strategic directions for health governance in conflict settings. Priority should be placed on adaptive policy development through rapid protocol revisions and the integration of evidence. Policymakers must invest in robust feedback mechanisms and participatory policymaking involving frontline workers. Strengthening integrated information systems and interagency coordination should be central to system stability, supported by resilient digital platforms and inclusive coordination bodies responsive to evolving local dynamics. Enhancing professional Competence in physical healthcare through intensive training and continuous supervision is essential. In contrast, mental healthcare stability should be reinforced through diversified financing, secure infrastructure, and integration into primary care networks.

Despite these contributions, limitations persist. Reliance on publicly available documents may introduce publication bias, and regions with intense conflict could be underrepresented. Although interrater reliability was high ($ICC = 0.891$), the coding of abstract constructs remains partly subjective. The cross-sectional design restricts causal inference, and variations across countries or conflict types were not examined. Future research should employ longitudinal and mixed-methods designs, integrating field interviews, cross-regional comparisons, and advanced analyses such as mediation or moderation within structural equation modeling. Developing rapid assessment and cost-effectiveness tools will further refine monitoring, evaluation, and donor resource optimization.

In conclusion, this study confirms that administrative resilience in Middle Eastern healthcare systems is a measurable and reliable construct encompassing four core dimensions. Adaptive policy remains the most critical component, followed by cross-sector coordination and operational stability. Together, these insights provide an empirical foundation and an actionable framework for policymakers, humanitarian actors, and health managers striving to sustain healthcare in the region's volatile, unpredictable conflict environments.

4. Conclusion

This study successfully constructed and validated a measurement model of administrative resilience in mental and physical healthcare services in conflict-affected regions of the Middle East through Confirmatory Factor Analysis within the framework of Structural

Equation Modeling. Analysis of 847 policy documents and operational reports from 12 countries between 2018 and 2024 confirmed that administrative resilience is a multidimensional construct comprising adaptive policy, cross-sectoral coordination, professional Competence, and operational stability. The four-dimensional model demonstrated a strong fit with CFI = 0.962, TLI = 0.955, RMSEA = 0.045, and SRMR = 0.038, all exceeding the recommended thresholds. All dimensions exhibited significant factor loadings ranging from 0.721 to 0.921 with p values less than 0.001, and excellent construct reliability as reflected in Cronbach's Alpha between 0.863 and 0.921, Composite Reliability between 0.879 and 0.934, and AVE between 0.647 and 0.782. Adaptive policy emerged as the strongest contributor to administrative resilience with an average loading of 0.849, followed by cross-sectoral coordination (0.819), operational stability (0.817), and professional Competence (0.798). The indicators with the most substantial loadings were regulatory flexibility ($\lambda = 0.921$), integrated information systems ($\lambda = 0.892$), service continuity ($\lambda = 0.894$), and healthcare staff qualifications ($\lambda = 0.867$).

The multigroup analysis confirmed that the model's dimensional structure was consistent across mental and physical health services, indicating model invariance and applicability across domains. Mean-difference analysis revealed significant differences between service types. Mental health services recorded higher scores in the professional competence dimension, with a mean of 3.34 compared to 2.97 in physical health services, yielding a Cohen's d of 0.39. Conversely, physical health services demonstrated greater operational stability, with a mean of 3.42 compared to 3.01 in mental health services, yielding a Cohen's d of 0.40. These contrasts highlight sectoral variations in priorities and challenges in the context of protracted conflict.

This research addresses a significant methodological gap by operationalizing administrative resilience into a confirmatory model that can be empirically tested, advancing beyond the conceptual works of Kruk, Barasa, and Blanchet. It extends the theoretical framework of Boin and Lodge by applying it to prolonged conflict environments, revealing the centrality of operational stability alongside adaptive capacity. The strong correlation between adaptive policy and cross-sectoral coordination (0.743) provides an evidence-based roadmap for enhancing flexibility and coordination mechanisms. Furthermore, it complements the findings of Jawad et al. and Wells et al. by quantifying the fragmentation and operational stability gaps between mental and physical health systems, showing that while the dimensional structure remains consistent, the practical manifestations differ, thus requiring tailored interventions.

For practical application, humanitarian organizations and ministries of health should prioritize rapid policy revision mechanisms, participatory policy formulation, and integrated information systems that connect multiple actors, including governments, non-governmental organizations, and international agencies. Continuous professional training, competency-based certification, diversified funding, and sustainability planning are necessary to strengthen both Competence and stability. A holistic monitoring framework incorporating indicators across all four dimensions should guide evaluation and ensure balanced, sustainable progress. Ultimately, administrative resilience is both measurable and actionable. It serves as a vital foundation for maintaining the health system's functionality and upholding the universal right to health for all people, including those living amid the enduring conflicts in the Middle East.

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