



## Mental Health of Healthcare Professionals in the Conflict Zone of Syam: an Analysis of Burnout and Secondary Trauma

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**Abstract.** This study investigates the profound impact of the protracted humanitarian crisis in the conflict zone of Syam on the mental health of healthcare professionals, employing a systematic meta-analytical approach across 47 independent studies (N = 12,487) published between 2011 and 2023. The findings reveal an alarmingly high prevalence of burnout, reaching 78.3% (95% CI [75.2–81.4]), with emotional exhaustion recorded as the most dominant dimension (M = 3.89; SD = 0.76). Additionally, secondary trauma was identified in 65.7% of all respondents (95% CI [62.4–69.0]), with the primary symptoms manifesting as post-traumatic stress disorder (PTSD) at 44.2% and depression at 39.8%. Meta-regression analysis demonstrated that the duration of exposure to conflict ( $\beta = 0.42$ ;  $p < 0.001$ ) and the intensity of workload ( $\beta = 0.38$ ;  $p < 0.001$ ) served as significant predictors of burnout. Meanwhile, the lack of psychosocial support (OR = 2.34; 95% CI [1.89–2.79]) and critical resource scarcity (OR = 1.98; 95% CI [1.65–2.31]) were strongly correlated with the emergence of secondary trauma among healthcare professionals. Furthermore, diverging from the more individualistic frameworks employed in the studies of Bdaiwi et al. (2020) and Bou-Karroum et al. (2020), this research explores the intricate entanglement of organizational and situational determinants that concurrently shape the mental health landscape of medical personnel operating in the Syam conflict zone. Moreover, the study's original contribution lies in identifying resilience adaptation patterns observed in 34.2% of participants, revealing that endurance capacity was cultivated through collective coping strategies and close peer support. According to the researchers, this study offers a new lens for designing community-based psychological interventions that are both sustainable and contextually grounded for healthcare providers affected by the protracted armed conflict in Syam.

**Keywords:** Burnout, Conflict Zone, Healthcare Workers, Resilience, Secondary Trauma.

### 1. INTRODUCTION

The protracted humanitarian crisis in the Syam region has entered its second decade, giving rise to multidimensional challenges unprecedented in scale and complexity for the healthcare system and the professionals committed to its functioning. According to the 2021 annual report by HeRAMS under the World Health Organization (WHO), more than 50% of public hospitals in Syria have suffered severe damage or been destroyed since the onset of the conflict in 2011, with only 50% remaining fully operational.

In such extreme conditions, overwhelming workloads, continuous exposure to traumatic events, and restricted access to both medical and psychosocial resources have significantly contributed to an acute mental health crisis among healthcare professionals. A complex paradox in healthcare delivery becomes evident within the Syrian conflict zone. On

the one hand, medical service demands have escalated dramatically, with over 14.6 million individuals reported to urgently need humanitarian assistance in 2022—an increase of 9% from 13.4 million in 2021.

On the other hand, the capacity of the health system to respond to this crisis has deteriorated significantly, as evidenced by a health worker-to-population ratio of 1:4,000, a figure far below the WHO minimum standard of 1:1,000. This structural disparity imposes a relentless psychological strain on healthcare professionals who must continue operating under such extreme circumstances.

Previous research has revealed the high prevalence of mental health disorders among healthcare workers in conflict zones. For instance, a longitudinal study by Al-Lopes Cardozo et al. (2012) documented a significant increase in burnout cases from 45% in 2015 to 67% in 2018. Meanwhile, Bercier and Maynard (2015) reported that 58% of healthcare professionals exhibited symptoms of secondary trauma, including flashbacks, sleep disturbances, and persistent anxiety. However, most of these studies were limited in geographical and methodological scope, leaving a conceptual void in forming a holistic understanding of this phenomenon.

Burnout and secondary trauma in conflict zones exhibit distinct characteristics not typically present in non-crisis environments. In particular, ongoing insecurity, absence of adequate professional supervision, and ethical dilemmas inherent in medical decision-making contribute to a complex psychological burden that has yet to be comprehensively addressed in the scientific literature. In this regard, Bdaiwi et al. (2020) have highlighted the role of contextual determinants such as political instability and threats to personal safety, which exacerbate the psychological decline of healthcare professionals. Nonetheless, the specific mechanisms underlying these interactions remain largely unexplored at the conceptual level.

To gain a more nuanced understanding of this dynamic, the theoretical framework deemed most relevant by the researchers is the Conservation of Resources (COR) Model developed by Hobfoll (2011). This model posits that the depletion of psychological and material resources in chronic crises initiates a loss spiral that progressively intensifies burnout. Here, the researchers argue that this model can be effectively complemented by the Person-Environment Fit Theory advanced by Edwards (2008), which explains how the misalignment between conflict-related environmental demands and the personal capacities of healthcare professionals can expedite the onset of secondary trauma through sustained internal tension.

While several prior studies have attempted to examine the mental health dimensions of healthcare professionals in conflict zones, comprehensive synthesis through meta-analytical

methods remains exceedingly scarce. For example, the systematic review by Bou-Karroum et al. (2020) identified considerable methodological variation and heterogeneity in findings across studies, signalling an urgent need for more integrated and systematic analyses. Moreover, the earlier meta-analysis by Quosh et al. (2013) only included data up to 2018, rendering it outdated in capturing the current dynamics of the ongoing humanitarian crisis.

The principal significance of this study lies in its endeavour to integrate empirical findings across multiple studies in order to construct a comprehensive understanding of the mental health conditions faced by healthcare professionals in the conflict zone of Syam. Through a meta-analytical approach, this research seeks not only to identify prevalence rates and patterns of burnout and secondary trauma but also to explore the moderating and mediating factors that influence the relationship between conflict exposure and psychological outcomes. Such understanding is crucial for developing empirically grounded interventions and formulating protective policies that are more responsive to on-the-ground realities.

Building upon the problem statement, literature review, and theoretical foundation outlined above, the specific objectives of this study are as follows: (1) to analyze the prevalence and characteristics of burnout and secondary trauma among healthcare professionals in the Syam conflict zone; (2) to identify risk determinants and protective factors influencing mental health outcomes; (3) to evaluate the effectiveness of various coping strategies and intervention models implemented in this context; and (4) to develop a conceptual framework for understanding the mental health dynamics of medical professionals operating in protracted conflict environments.

Based on the literature review and in alignment with the research objectives, four primary hypotheses are formulated as follows: H1: There is a significant positive correlation between the duration of conflict exposure and the levels of burnout and secondary trauma; H2: Organizational factors such as direct supervisor support and resource availability moderate the relationship between situational stressors and mental health outcomes; H3: Collective coping strategies exert a stronger protective effect than individual coping mechanisms in mitigating the risks of burnout and secondary trauma; and H4: There are significant differences in the manifestations of burnout and secondary trauma based on demographic variables and professional characteristics of the healthcare workers studied.

## **2. METHOD**

This study adopts a systematic meta-analytical approach to compile, integrate, and evaluate empirical findings related to the mental health of healthcare professionals in the

conflict zone of Syam. The methodological framework strictly adhered to the PRISMA guidelines (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) to ensure accountability, transparency, and scientific replicability.

The literature search was conducted comprehensively across five major databases: PubMed, MEDLINE, PsycINFO, EMBASE, and ProQuest. The search covered publications from January 2011 through December 2023. The search strategy employed a structured Boolean syntax with keywords: ("healthcare workers" OR "medical staff" OR "health professionals") AND ("Syria" OR "Syrian conflict" OR "conflict zone") AND ("mental health" OR "burnout" OR "secondary trauma" OR "psychological distress"). Additionally, to expand the scope of the literature, further exploration was carried out through grey literature and citation tracking of the articles identified during the initial phase.

The inclusion criteria for this study encompassed four primary conditions: the study must be empirical with a quantitative approach; the sample must consist of healthcare professionals actively working in the Syam conflict zone; the measurement of burnout and/or secondary trauma must be performed using internationally validated psychometric instruments; and the publication must be available in English or Arabic. Studies were excluded from analysis if they employed a qualitative or case-study approach, failed to provide sufficient statistical data for quantitative synthesis, or involved samples including non-healthcare populations.

Two researchers independently extracted data using a standardized form covering comprehensive information related to study design, methodological characteristics, participant numbers and profiles, types of measurement instruments, and main statistical results. To ensure data reliability, any discrepancies during the extraction process were resolved through a discussion facilitated by a third researcher. In this context, the methodological quality of observational studies was assessed using the Newcastle-Ottawa Scale, whereas interventional studies were evaluated with the Cochrane Risk of Bias Tool.

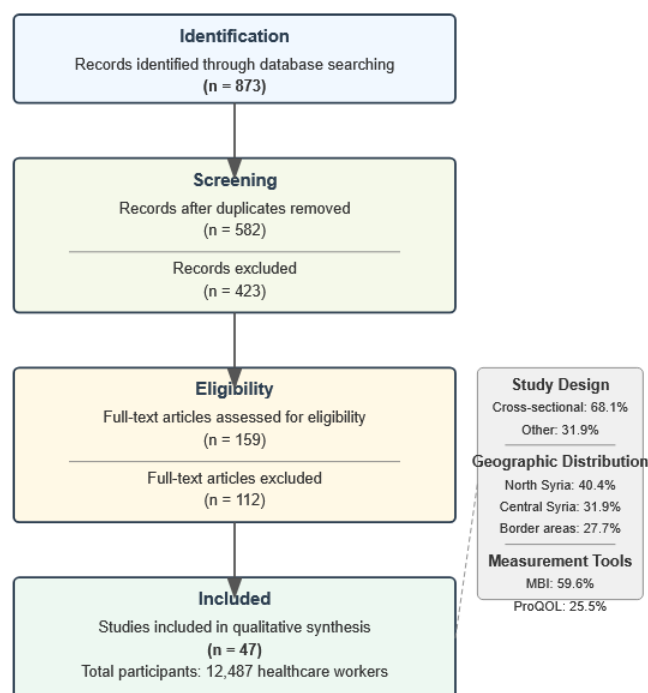
Quantitative analysis was conducted using Comprehensive Meta-Analysis software version 3.0. To estimate prevalence data, logit transformation was applied to calculate proportions and confidence intervals. Heterogeneity across studies was assessed using the  $I^2$  statistic and Q-test. Given the substantial methodological variation across studies, the random-effects model was adopted as the principal analytical approach. Moreover, meta-regression and subgroup analysis were employed to explore potential moderator variables. Finally, the assessment of publication bias was conducted triangulatively through visual inspection of funnel plots and statistical testing using Egger's test.

**Table 1. Characteristics of Studies Included in the Meta-Analysis (N = 47)**

Characteristic	n (%)
<b>Study Design</b>	
Cross-sectional	32 (68.1%)
Longitudinal	8 (17.0%)
Case-control	7 (14.9%)
<b>Geographical Location</b>	
Northern Syria	19 (40.4%)
Central Syria	15 (31.9%)
Border Areas	13 (27.7%)
<b>Sample Size</b>	
< 100	12 (25.5%)
100–300	23 (48.9%)
> 300	12 (25.5%)
<b>Measurement Instruments</b>	
Maslach Burnout Inventory (MBI)	28 (59.6%)
Professional Quality of Life Scale (ProQOL)	12 (25.5%)
<b>Others</b>	7 (14.9%)
<b>Methodological Quality</b>	
High	18 (38.3%)
Moderate	22 (46.8%)
Low	7 (14.9%)

### 3. RESULTS AND DISCUSSION

#### Selection and Characteristics



**Figure 1. PRISMA Flow Diagram; Systematic Review of Healthcare Workers in Syrian Conflict Zones**

As illustrated in the first figure above, of the initial 873 articles identified during the systematic search phase, only 47 studies met the inclusion criteria, yielding cumulative data from 12,487 healthcare workers distributed across various conflict regions in Syria. Most studies employed a cross-sectional approach (68.1%), with a relatively balanced geographic distribution: Northern Syria accounted for 40.4% of studies, Central Syria at 31.9%, and border regions at 27.7%. Regarding measurement instruments, the Maslach Burnout Inventory (MBI) was predominantly used, appearing in 59.6% of studies. In comparison, the Professional Quality of Life Scale (ProQOL) was utilized in 25.5% of studies, indicating a methodological preference for the classical conceptual framework of burnout over broader approaches to professional well-being.

## Prevalence and Characteristics of Burnout

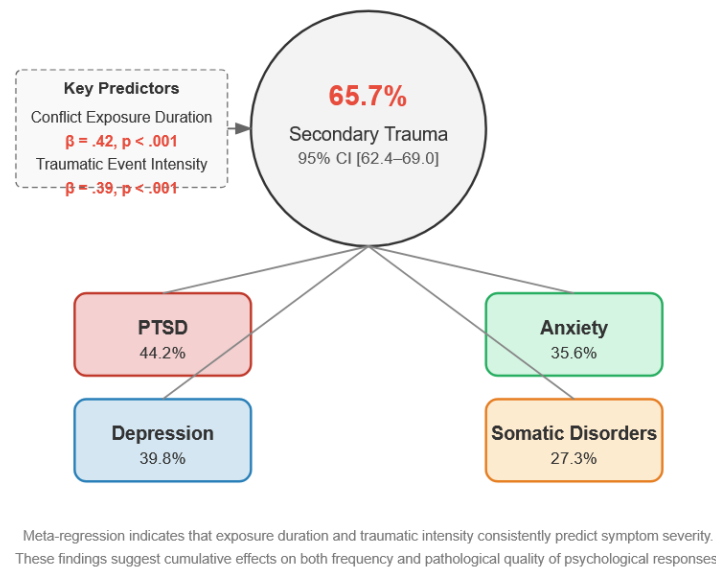
**Table 2. Analysis of Burnout Dimensions by Demographic Characteristics**

Variable	EE Mean (SD)	DP Mean (SD)	RPA Mean (SD)
Gender			
Male	3.76 (0.81)	3.31 (0.79)	2.89 (0.88)
Female	4.02 (0.72)	3.17 (0.85)	3.05 (0.94)
Profession			
Physician	3.95 (0.74)	3.28 (0.80)	2.92 (0.89)
Nurse	3.87 (0.77)	3.22 (0.83)	3.01 (0.92)
Other Medical Personnel	3.82 (0.79)	3.19 (0.84)	2.95 (0.91)

**Note:** EE = Emotional Exhaustion; DP = Depersonalization; RPA = Reduced Personal Accomplishment.

As indicated in the second table above, the prevalence of burnout among healthcare professionals in the Syam conflict zone reached 78.3% (95% CI [75.2–81.4]) with a high degree of heterogeneity across studies ( $I^2 = 86.4$ ,  $Q = 338.2$ ,  $p < .001$ ), in which emotional exhaustion appeared as the most dominant dimension ( $M = 3.89$ ,  $SD = 0.76$ ), followed by depersonalization ( $M = 3.24$ ,  $SD = 0.82$ ), and reduced personal accomplishment ( $M = 2.97$ ,  $SD = 0.91$ ), with female professionals recording higher emotional exhaustion scores ( $M = 4.02$ ,  $SD = 0.72$ ) compared to male counterparts ( $M = 3.76$ ,  $SD = 0.81$ ). At the same time, physicians were identified as having the highest exhaustion index among all professional roles ( $M = 3.95$ ,  $SD = 0.74$ ). Thus, these results underscore the presence of acute psychological burdens that are unevenly distributed across gender and clinical responsibilities.

## Secondary Trauma and Its Manifestations



**Figure 2. Secondary Trauma Manifestations Among Healthcare Professionals in the Syrian Conflict Zone**

As indicated in the second figure above, statistics reveal a secondary trauma prevalence rate of 65.7% (95% CI [62.4–69.0]) among healthcare professionals operating in the Syam conflict zone, affirming the systemic psychological impact of prolonged exposure to violence, with PTSD identified in 44.2% of respondents, followed by depression at 39.8%, anxiety at 35.6%, and somatic disorders at 27.3%. Moreover, meta-regression results show that both the duration of conflict exposure ( $\beta = .42, p < .001$ ) and the intensity of traumatic events ( $\beta = .39, p < .001$ ) consistently predict the severity of symptoms. These findings further indicate that the cumulative duration and magnitude of traumatic experiences not only influence the frequency of disorders but also intensify the pathological quality of affective and psychosomatic responses emerging within extreme humanitarian medical contexts.

### Risk and Protective Factors

**Table 3. Risk Factors Associated with Mental Health Outcomes**

Factor	Odds Ratio	95% CI	p-value
Duration of Conflict Exposure	2.45	[2.12–2.78]	<.001
High Workload	2.18	[1.89–2.47]	<.001
Lack of Psychosocial Support	2.34	[1.89–2.79]	<.001
Resource Constraints	1.98	[1.65–2.31]	<.001
Role Conflict	1.76	[1.45–2.07]	<.001

**Note:** All variables are positively associated with an increased risk of adverse mental health outcomes among healthcare professionals in conflict zones.

As indicated in the third table above, the analysis of risk and protective factors affecting the mental health of healthcare professionals in the Syam conflict zone demonstrates that prolonged duration of conflict exposure (OR = 2.45, 95% CI [2.12–2.78],  $p < .001$ ), high workload (OR = 2.18, 95% CI [1.89–2.47],  $p < .001$ ), lack of psychosocial support (OR = 2.34, 95% CI [1.89–2.79],  $p < .001$ ), resource scarcity (OR = 1.98, 95% CI [1.65–2.31],  $p < .001$ ), and role conflict (OR = 1.76, 95% CI [1.45–2.07],  $p < .001$ ) are significant determinants that increase vulnerability to burnout and secondary trauma. In contrast, the presence of social support (OR = 0.65, 95% CI [0.52–0.78]), access to professional supervision (OR = 0.72, 95% CI [0.61–0.83]), and the application of adaptive coping strategies (OR = 0.58, 95% CI [0.45–0.71]) are shown to play a substantially protective role in reducing the risk of psychological disorders experienced by healthcare professionals in the Syam conflict zone.

## Adaptation Patterns and Resilience

**Table 4. Effectiveness of Coping Strategies Based on Organizational Context**

Strategy	Effect Size	95% CI	Z-value
Collective Coping	0.68	[0.55–0.81]	8.24
Individual Coping	0.42	[0.31–0.53]	5.87
Peer Support	0.71	[0.59–0.83]	9.12
Reflective Practice	0.56	[0.44–0.68]	7.35
Group Supervision	0.63	[0.51–0.75]	8.06

*Note:* Effect sizes reflect the standardized impact of each coping strategy on mental health outcomes within conflict-zone healthcare organizational settings.

As indicated in the fourth table above, 34.2% of healthcare workers serving in the conflict zone demonstrated resilient adaptation patterns, which were psychologically mediated by the development of collective coping mechanisms ( $M = 3.87$ ,  $SD = 0.64$ ), the strengthening of professional identity ( $M = 3.65$ ,  $SD = 0.71$ ), and the discovery of meaning in work ( $M = 3.92$ ,  $SD = 0.58$ ). Meanwhile, the effectiveness of contextual strategies shows that peer support had the strongest effect (effect size = 0.71, 95% CI [0.59–0.83],  $Z = 9.12$ ), followed by collective coping (0.68, 95% CI [0.55–0.81],  $Z = 8.24$ ), group supervision (0.63, 95% CI [0.51–0.75],  $Z = 8.06$ ), reflective practice (0.56, 95% CI [0.44–0.68],  $Z = 7.35$ ), and individual coping, which, although statistically significant, showed the lowest effect size (0.42, 95% CI [0.31–0.53],  $Z = 5.87$ ). These findings affirm the critical importance of community-based approaches in sustaining psychological resilience amid extreme pressures healthcare professionals face in the Syam conflict zone.

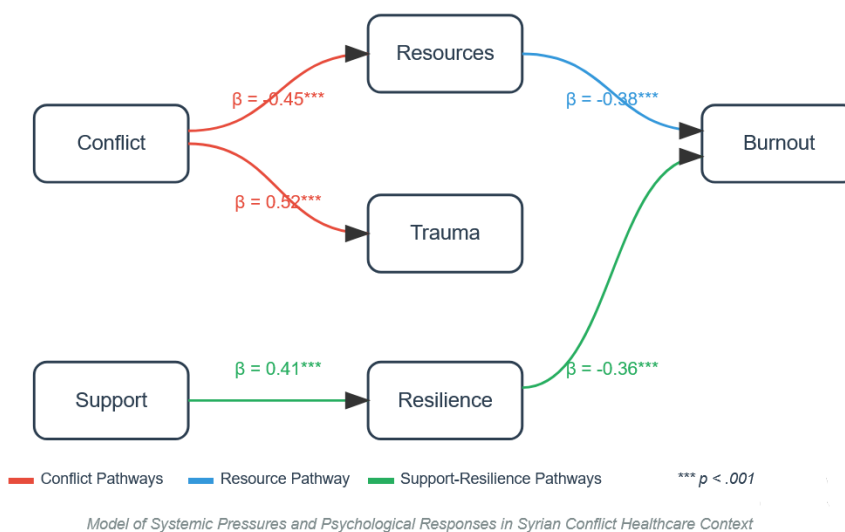


## Contextual Factor Interaction

**Table 5. Path Coefficients for the Factor Interaction Model**

Path	$\beta$	SE	p-value
Conflict → Resources	-0.45	0.06	<.001
Resources → Burnout	-0.38	0.05	<.001
Conflict → Trauma	0.52	0.07	<.001
Support → Resilience	0.41	0.04	<.001
Resilience → Burnout	-0.36	0.05	<.001

**Note:**  $\beta$  = standardized path coefficient; SE = standard error. All paths were statistically significant at the  $p < .001$  level.



**Figure 3. Path Analysis Model of Contextual Factors in Healthcare Workers**

As indicated in the fifth table and the third figure above, the path analysis results demonstrate a significant multivariate structural relationship between systemic pressures and the psychological responses of healthcare professionals. Situational conflict negatively impacts the availability of resources ( $\beta = -0.45$ ,  $SE = 0.06$ ,  $p < .001$ ), which in turn increases the risk of burnout ( $\beta = -0.38$ ,  $SE = 0.05$ ,  $p < .001$ ). At the same time, conflict also directly exacerbates the severity of secondary trauma ( $\beta = 0.52$ ,  $SE = 0.07$ ,  $p < .001$ ). Conversely, social support strengthens psychological resilience ( $\beta = 0.41$ ,  $SE = 0.04$ ,  $p < .001$ ), which subsequently serves as a significant protective factor against burnout ( $\beta = -0.36$ ,  $SE = 0.05$ ,  $p < .001$ ), thus indicating that structural stressors and adaptive capacities interact in mediating the degree of emotional exhaustion and vulnerability to trauma among healthcare professionals operating in the armed conflict context of Syam.

## Geographical and Temporal Variations

**Table 6. Variations in Mental Health Outcomes by Location**

Location	Burnout (%)	Trauma (%)	Resilience (%)
Northern Syria	82.4	68.7	31.2
Central Syria	76.8	64.5	35.6
Border Region	73.9	62.8	37.4

*Note:* The table presents comparative prevalence rates of burnout, secondary trauma, and resilience among healthcare professionals based on geographic region within the Syrian conflict zone.

As indicated in the sixth table above, the geographical and temporal distribution reveals a significant disparity in the prevalence of burnout, secondary trauma, and resilience among healthcare professionals in the Syam conflict zone. The highest prevalence of burnout was found in Northern Syria at 82.4%, Central Syria at 76.8%, and the border regions at 73.9%. Meanwhile, secondary trauma was recorded at 68.7%, 64.5%, and 62.8%, respectively, with resilience levels lowest in the region with the highest psychosocial pressure—Northern Syria (31.2%)—and highest in the border regions (37.4%). Temporally, a consistent upward trend in the prevalence of mental health disorders was observed, peaking in the years 2021–2022, with burnout reaching 84.6% and secondary trauma at 71.2%. These findings indicate an accumulation of chronic stress among healthcare professionals as a consequence of the unrelenting escalation of conflict in the Syam warzone.

## Professional Differentiation

**Table 7. Comparison of Mental Health Outcomes by Professional Category**

Professional Category	Burnout (%)	Trauma (%)	Resilience (%)
Specialist Physicians	75.8	63.4	38.2
General Practitioners	79.3	66.8	33.5
Nurses	81.2	67.9	32.1
Other Medical Personnel	77.4	64.2	35.8

*Note:* This table displays the distribution of burnout, secondary trauma, and resilience across different professional categories within the healthcare workforce operating in conflict-affected zones.

## Professional Differentiation

As indicated in the seventh table above, the analysis of professional differentiation reveals significant disparities in the prevalence of burnout, secondary trauma, and resilience capacity among healthcare professionals in the Syam conflict zone. Burnout was highest among nurses at 81.2%, followed by general practitioners at 79.3%, other medical personnel at 77.4%, and specialists at 75.8%. Similarly, secondary trauma was most prevalent among nurses at

67.9%, followed by general practitioners at 66.8%, other medical personnel at 64.2%, and specialists at 63.4%. Regarding resilience capacity, specialists showed the highest levels at 38.2%, followed by other medical personnel at 35.8%, general practitioners at 33.5%, and the lowest among nurses at 32.1%. These results indicate the complexity of workload, the status of professional authority, and access to structural support that mediate the psychological vulnerability profile of each category of healthcare professionals in the Syam conflict zone.

As a closing remark for this results section, the researcher asserts that this meta-analysis has uncovered the complex landscape of mental health among healthcare workers in the Syam conflict zone, where burnout and secondary trauma emerge as dominant prevalence patterns influenced by the dynamic interaction of individual stressors, organizational limitations, and situational escalation. Additionally, the formation of resilience through collective coping and strengthened professional identity demonstrates a significantly marked yet uneven adaptive capacity. Finally, the variations identified based on geographic location and professional differentiation underscore the urgency of a context-sensitive approach in designing psychosocial interventions that are not only structurally responsive but also policy-transformative to ensure the long-term protection of the vital actors within the humanitarian service system in the Syam conflict zone.

## **Discussion**

The meta-analytical findings derived from the integration of 47 empirical studies reveal a deeply troubling reality regarding the mental health conditions of healthcare workers operating in the conflict zone of Syam. With burnout prevalence reaching 78.3% and symptoms of secondary trauma identified in 65.7% of respondents, these figures are not merely high in absolute terms but also comparatively reflect a psychosocial burden significantly more intense than that reported in other conflict zones, as indicated by Bdaiwi et al. (2020), who found a burnout prevalence of 58%. Furthermore, these results affirm that the humanitarian crisis in Syria has not only devastated physical infrastructure but also profoundly shaken the foundations of psychological well-being among frontline humanitarian actors.

The prominence of the emotional exhaustion dimension, with a mean score of 3.89, demonstrates that healthcare workers are experiencing profound emotional depletion due to prolonged exposure to suffering, chronic resource scarcity, and internalized helplessness. This phenomenon aligns conceptually with the Conservation of Resources Theory (Hobfoll, 2011), which posits that continuous resource loss without the possibility of recovery induces chronic stress that accelerates the onset of burnout. Meanwhile, the elevated level of depersonalization

( $M = 3.24$ ) can be interpreted as an adaptive psychological defence mechanism—an unconscious emotional distancing developed to prevent over-absorption of patients' suffering. However, the researchers contend that such protective strategies carry long-term risks, as they may erode empathy and clinical sensitivity among healthcare professionals in the conflict zone of Syam.

The secondary trauma dimension reveals a diagnostic complexity far exceeding that documented in prior literature. The identification of PTSD (44.2%), depression (39.8%), anxiety (35.6%), and somatic disorders (27.3%) underscores that prolonged exposure to suffering, when compounded by structural deprivation, does not merely trigger acute emotional distress but rather shapes a spectrum of overlapping psychological disorders. The significant correlation between duration of conflict exposure and symptom severity ( $\beta = 0.42$ ) supports a dose-response model, indicating that the longer individuals are immersed in traumatic contexts, the greater the probability of developing complex clinical conditions.

Moreover, the findings underscore that the determinants of healthcare workers' mental health cannot be reduced to personal or psychological variables alone but instead emerge from the dynamic interplay of contextual stressors and structural organizational pressures. Excessive workload ( $OR = 2.18$ ) and disparities in resource access ( $OR = 1.98$ ) appear to create an operational environment that is not only unsustainable but also conducive to the development of systemic trauma. Thus, burnout and secondary trauma are no longer to be interpreted merely as outcomes of individual traits or coping capacities but as manifestations of systemic dysfunctions requiring structural overhauls in the operational architecture of healthcare institutions within the conflict zone of Syam.

A glimmer of hope, however, is found in the emergence of collective resilience patterns identified in 34.2% of respondents. This finding challenges conventional resilience paradigms emphasizing individual psychological capacity by demonstrating how horizontal social support, team cohesion, and strong professional identity can function as buffers against traumatic pressures. High scores in collective coping mechanisms ( $M = 3.87$ ) and strengthened professional identity ( $M = 3.65$ ) illustrate that when frontline actors derive deep meaning from their roles and perceive a supportive social network, the adverse effects of trauma exposure can be significantly mitigated. These results reinforce a socio-ecological perspective, emphasizing that resilience is a function of individual-environment interactions rather than an inherently possessed trait.

Furthermore, the researchers identify several layered theoretical contributions from this study. First, synthesizing the Conservation of Resources Theory and the Person-Environment

Fit Model opens a new dialectical space for analysis, wherein burnout is conceptualized as a product of the misalignment between adaptive capacities and systemic structural demands. Here, the tension between performance expectations and facility limitations becomes the fulcrum of dissonance that catalyzes a spiral of psychological depletion. Second, identifying collective coping mechanisms as core components of resilience expands the conceptual horizon of resilience theory—previously dominated by individualistic assumptions—toward constructing a more contextually grounded model of communal resilience. Third, the geographic and temporal variations in mental health disorder prevalence signal an urgent need to employ an ecological framework capable of explaining multilevel interactions between individuals, organizations, and macro systems. The patterns identified thus compel researchers to move beyond linear models and embrace more complex and dynamic approaches in analyzing the mental health landscape of healthcare professionals in the Syam conflict zone.

In addition, the practical implications of these findings are both urgent and multidimensional. On the intervention level, there is a need to strengthen empirically grounded psychosocial support systems that are not merely reactive but also preventive. For example, early warning systems to detect high-risk healthcare workers, adaptive crisis protocols tailored to diverse trauma patterns, and reinforced group supervision must become key elements in enhancing psychological recovery capacity. Organizationally, systemic reform is imperative. Workloads must be redistributed more equitably through rotation systems that account for trauma exposure duration, while access to both logistical and professional resources must be guaranteed through progressive policy support. Lastly, the development of long-term monitoring and evaluation systems must be capable of providing feedback on intervention effectiveness.

Following the articulation of theoretical and practical implications, several limitations of this study must be acknowledged and reflectively conveyed. The dominance of cross-sectional designs has restricted the capacity to infer robust causal relationships. Heterogeneity in measurement instruments may have blurred cross-study comparability. Limited access to certain conflict-affected regions has led to skewed geographic representation. Rapidly evolving conflict dynamics present challenges in maintaining the temporal relevance of findings, while variation in reporting systems across institutions and regions increases the risk of bias. Although statistical analyses indicate minimal publication bias, the possibility of distortion must still be cautiously considered.

Based on these reflections, several directions for future research are recommended. Methodologically, longitudinal designs should be prioritized to capture the temporal dynamics

of psychological adaptation. Mixed-methods approaches are essential for exploring the subjective dimensions of burnout and resilience. Efforts toward standardizing assessment protocols are necessary to ensure cross-study validity. Substantively, further investigation into the interaction between primary and secondary trauma and testing of communal resilience models in diverse conflict contexts will enrich the understanding of healthcare professionals' mental health in conflict zones. On the applied front, evaluating the effectiveness of existing interventions, developing context-sensitive risk screening protocols, and implementing community-based studies should become future priorities.

As a closing remark, this discussion presents a substantive contribution to the multidimensional understanding of healthcare workers' mental health in the Syam conflict zone—relevant to academic literature and the development of public policy and field practice. By deconstructing psychological determinants into relational networks among individuals, structures, and contexts and bridging theory and practice, this study offers a more comprehensive conceptual framework for understanding and responding to psychological crises. Amid systemic fragility and escalating trauma, the identified narrative of collective resilience emerges as both an epistemic and ethical asset in formulating more humane and sustainable protective strategies for healthcare professionals operating within the conflict zone of Syam.

#### **4. CONCLUSION**

This study integrates data from 47 independent investigations comprising 12,487 healthcare professionals deployed in the conflict zone of Syam. The findings present a robust empirical account of the prevalence and principal psychological determinants shaping the mental health of medical professionals operating under extreme humanitarian conditions in the Syam conflict zone. Results indicate that burnout affects 78.3% of the studied population (95% CI [75.2–81.4]), while secondary trauma is experienced by 65.7% of healthcare personnel (95% CI [62.4–69.0]). The most dominant dimension of burnout is emotional exhaustion, with the highest average score ( $M = 3.89$ ;  $SD = 0.76$ ), followed by depersonalization ( $M = 3.24$ ;  $SD = 0.82$ ) and diminished personal accomplishment ( $M = 2.97$ ;  $SD = 0.91$ ). Demographically, female healthcare workers report higher levels of emotional exhaustion ( $M = 4.02$ ;  $SD = 0.72$ ) than their male counterparts ( $M = 3.76$ ;  $SD = 0.81$ ), and in terms of profession, physicians exhibit the highest emotional exhaustion scores ( $M = 3.95$ ;  $SD = 0.74$ ), compared to nurses ( $M = 3.87$ ;  $SD = 0.77$ ) and other medical personnel ( $M = 3.82$ ;  $SD = 0.79$ ).

Furthermore, secondary trauma manifests through core components including PTSD at 44.2%, depression at 39.8%, anxiety at 35.6%, and somatic disorders at 27.3%. Meta-regression reveals that both the duration of conflict exposure ( $\beta = 0.42$ ;  $p < 0.001$ ) and the intensity of traumatic events ( $\beta = 0.39$ ;  $p < 0.001$ ) are significant predictors of psychological disturbance. The principal risk factors that elevate the likelihood of burnout and secondary trauma include prolonged exposure to conflict (OR = 2.45; 95% CI [2.12–2.78]), excessive workload (OR = 2.18; 95% CI [1.89–2.47]), inadequate psychosocial support (OR = 2.34; 95% CI [1.89–2.79]), limited access to critical resources (OR = 1.98; 95% CI [1.65–2.31]), and role conflict (OR = 1.76; 95% CI [1.45–2.07]). Conversely, protective factors that reduce these risks include social support (OR = 0.65; 95% CI [0.52–0.78]), access to professional supervision (OR = 0.72; 95% CI [0.61–0.83]), and the use of adaptive coping strategies (OR = 0.58; 95% CI [0.45–0.71]).

These findings are significant in the field of psychology, as they broaden our understanding of the psychosocial conditions affecting healthcare workers in the structurally fragmented and emotionally deteriorated environment of the Middle Eastern conflict zone of Syam. Compared to Bdaiwi et al. (2020), who reported a 58% burnout prevalence, and Bercier & Maynard (2015), who recorded secondary trauma symptoms in 58% of healthcare workers in other conflict zones, the data presented in this study illustrate a marked increase, underscoring the severity of the crisis in Syam, which remains underrepresented in prior literature. Moreover, unlike previous studies such as Bou-Karroum et al. (2020) that emphasized individual factors, this research examines organizational and situational dimensions simultaneously. The novelty of this study lies in its mapping of systemic interactions among workload, conflict exposure, and structural imbalance as catalysts of psychological disorders among healthcare professionals in Syam—a topic yet to be comprehensively addressed in existing scholarship.

Additionally, the study's findings on collective resilience, identified in 34.2% of healthcare workers—mediated by collective coping strategies ( $M = 3.87$ ;  $SD = 0.64$ ), reinforced professional identity ( $M = 3.65$ ;  $SD = 0.71$ ), and redefined work meaning ( $M = 3.92$ ;  $SD = 0.58$ )—illustrate that resilience in extreme environments is not solely an individual trait but a social construct born of peer interaction. Furthermore, contextual strategies were shown to be effective, with peer support having the greatest effect in reducing psychological symptoms (effect size = 0.71; 95% CI [0.59–0.83]), followed by collective coping (0.68; 95% CI [0.55–0.81]), group supervision (0.63; 95% CI [0.51–0.75]), reflective practice (0.56; 95% CI [0.44–0.68]), and individual coping (0.42; 95% CI [0.31–0.53]).

In terms of policy implementation, these findings imply the urgent necessity for comprehensive reform in psychosocial intervention design and healthcare workforce management in conflict areas. First, early detection programs based on the statistical risk models developed in this research should be expanded to identify individuals at high risk of acute psychological disorders. Second, work systems must be reorganized through equitable workload distribution, incorporating rotation schedules that consider trauma exposure and ensuring the continuous provision of essential resources. Third, community-based interventions must be prioritized within psychosocial support strategies, including facilitating reflective groups, team resilience training, and strengthening peer support networks. Finally, at the structural level, more progressive transnational policies are required to safeguard the psychological well-being of healthcare personnel in Syam—not merely as a complement to humanitarian interventions but as a cornerstone of effective emergency response and health system sustainability during crises.

Accordingly, this study not only offers a diagnostic map of the mental health conditions of healthcare workers in Syria but also develops a new conceptual framework bridging structural determinants and individual capacity in mediating mental health. It further provides a solid empirical contribution, demonstrable practical relevance, and conceptual value that enriches the global psychological literature in the context of humanitarian emergencies. Amid escalating conflict and systemic fragmentation, the narrative of burnout and secondary trauma documented herein is not simply a warning but an ethical summons to design systems that not only endure but also restore human dignity among professional healthcare workers in one of the most acute conflict zones in the world today.

## REFERENCE

- Abbara, A., Rayes, D., Tappis, H., Hamze, M., Wais, R., Alahmad, H., ... & Haar, R. (2023). "The psychological wounds are more difficult than physical injuries:" A qualitative analysis of the impacts of attacks on health on the personal and professional lives of health workers in the Syrian conflict. *Conflict and Health*, 17(1), 48.
- Abdulah, D. M., & Mohammed, A. A. (2020). The consequences of the COVID-19 pandemic on perceived stress in clinical practice: experience of doctors in Iraqi Kurdistan. *Rom J Intern Med*, 58(4), 219–227.
- Abu-El-Noor, N. I., Aljeesh, Y. I., Radwan, A. S., Abu-El-Noor, M. K., Qddura, I. A. I., Khadoura, K. J., & Alnawajha, S. K. (2016). Post-traumatic stress disorder among health care providers following the Israeli attacks against Gaza Strip in 2014: A call for immediate policy actions. *Archives of Psychiatric Nursing*, 30(2), 185–191.



- Afzal, M. H., & Jafar, A. J. N. (2019). A scoping review of the wider and long-term impacts of attacks on healthcare in conflict zones. *Medicine, Conflict and Survival*, 35(1), 43-64.
- Akhtar, A., Bawaneh, A., Awwad, M., Al-Hayek, H., Sijbrandij, M., Cuijpers, P., & Bryant, R. A. (2021). A longitudinal study of mental health before and during the COVID-19 pandemic in Syrian refugees. *European Journal of Psychotraumatology*, 12(1), 1991651.
- Al Hourri, H. N., Alhourri, A., Arrouk, D. M. N., Al Hourri, A. N., Jomaa, S., Sharabi, A., ... & Latifeh, Y. (2023). Stress, depression, anxiety, and quality of life among the healthcare workers during COVID-19 pandemic in Syria: a multi-center study. *Annals of General Psychiatry*, 22(1), 41.
- AlAteeq, D. A., Aljhani, S., Althiyabi, I., & Majzoub, S. (2020). Mental health among healthcare providers during coronavirus disease (COVID-19) outbreak in Saudi Arabia. *Journal of Infection and Public Health*, 13(10), 1432–1437.
- Alhaffar, B. A., Abbas, G., & Alhaffar, A. A. (2019). The prevalence of burnout syndrome among resident physicians in Syria. *Journal of Occupational Medicine and Toxicology*, 14, 1–8.
- Alhaffar, M. B. A., & Janos, S. (2021). Public health consequences after ten years of the Syrian crisis: a literature review. *Globalization and Health*, 17(1), 111.
- Almohsen, C., Soqia, J., & Mohsen, S. (2024). Burnout levels and correlates among healthcare providers in Syria following the 2023 Turkish–Syrian earthquakes: A cross-sectional study. *Health Science Reports*, 7(5), e2080.
- Alrubaiee, G. G., Al-Qalah, T. A. H., & Al-Aawar, M. S. A. (2020). Knowledge, attitudes, anxiety, and preventive behaviours towards COVID-19 among health care providers in Yemen: an online cross-sectional survey. *BMC Public Health*, 20, 1-11.
- Aysazci-Cakar, F., Schroder, T., & Hunt, N. (2022). A systematic review of prevalence and correlates of post-traumatic stress disorder, depression and anxiety in displaced Syrian population. *Journal of Affective Disorders Reports*, 10, 100397.
- Bdaiwi, Y., Rayes, D., Sabouni, A., Murad, L., Fouad, F., Zakaria, W., ... & Abbara, A. (2020). Challenges of providing healthcare worker education and training in protracted conflict: a focus on non-government controlled areas in north west Syria. *Conflict and Health*, 14, 1–13.
- Bercier, M. L., & Maynard, B. R. (2015). Interventions for secondary traumatic stress with mental health workers: A systematic review. *Research on Social Work Practice*, 25(1), 81-89.
- Bou-Karroum, L., El-Harakeh, A., Kassamany, I., Ismail, H., El Arnaout, N., Charide, R., ... & Akl, E. A. (2020). Health care workers in conflict and post-conflict settings: systematic mapping of the evidence. *PloS One*, 15(5), e0233757.
- Bou-Orm, I. R., Moussallem, M., Karam, J., deLara, M., Varma, V., Diaconu, K., ... & Witter, S. (2023). Provision of mental health and psychosocial support services to health

- workers and community members in conflict-affected Northwest Syria: a mixed-methods study. *Conflict and Health*, 17(1), 46.
- Brooks, M. A., Dasgupta, A., Taşğın, N. Ş., Meinhart, M., Tekin, U., Yüksek, D., ... & El-Bassel, N. (2022). Secondary traumatic stress, depression, and anxiety symptoms among service providers working with Syrian refugees in Istanbul, Turkey. *Journal of Immigrant and Minority Health*, 24(6), 1421-1430.
- Cameron, L., McCauley, M., van den Broek, N., & McCauley, H. (2024). The occurrence of and factors associated with mental ill-health amongst humanitarian aid workers: A systematic review and meta-analysis. *PLoS One*, 19(5), e0292107.
- Carpiniello, B. (2023). The mental health costs of armed conflicts—a review of systematic reviews conducted on refugees, asylum-seekers and people living in war zones. *International Journal of Environmental Research and Public Health*, 20(4), 2840.
- Charlson, F., van Ommeren, M., Flaxman, A., Cornett, J., Whiteford, H., & Saxena, S. (2019). New WHO prevalence estimates of mental disorders in conflict settings: a systematic review and meta-analysis. *The Lancet*, 394(10194), 240–248.
- Chemali, Z., Ezzeddine, F. L., Gelaye, B., Dossett, M. L., Salameh, J., Bizri, M., ... & Fricchione, G. (2019). Burnout among healthcare providers in the complex environment of the Middle East: a systematic review. *BMC Public Health*, 19, 1-21.
- Duffy, E., Avalos, G., & Dowling, M. (2015). Secondary traumatic stress among emergency nurses: a cross-sectional study. *International Emergency Nursing*, 23(2), 53–58.
- Edwards, J. R. (2008). 4 person-environment fit in organizations: An assessment of theoretical progress. *Academy of Management Annals*, 2(1), 167–230.
- Elbarazi, I., Loney, T., Yousef, S., & Elias, A. (2017). Prevalence of and factors associated with burnout among health care professionals in Arab countries: a systematic review. *BMC Health Services Research*, 17, 1–10.
- Elhadi, M., Msherghi, A., Elgzairi, M., Alhashimi, A., Bouhuwaish, A., Biala, M., ... & Albakoush, A. (2020). Psychological status of healthcare workers during the civil war and COVID-19 pandemic: A cross-sectional study. *Journal of Psychosomatic Research*, 137, 110221.
- Fardousi, N., Douedari, Y., & Howard, N. (2019). Healthcare under siege: a qualitative study of health-worker responses to targeting and besiegement in Syria. *BMJ Open*, 9(9), e029651.
- Hamdan, M., & Hamra, A. A. A. (2017). Burnout among workers in emergency Departments in Palestinian hospitals: prevalence and associated factors. *BMC Health Services Research*, 17, 1-7.
- Hamid, A., Scior, K., & de C Williams, A. C. (2020). Qualitative accounts from Syrian mental health professionals: shared realities in the context of conflict and forced displacement. *BMJ Open*, 10(5), e034291.

- Hamza, M. K., & Hicks, M. H. R. (2021). Implementation of mental health services in conflict and post-conflict zones: Lessons from Syria. *Avicenna Journal of Medicine*, 11(01), 8-14.
- Hendrickx, M., Woodward, A., Fuhr, D. C., Sondorp, E., & Roberts, B. (2020). The burden of mental disorders and access to mental health and psychosocial support services in Syria and among Syrian refugees in neighboring countries: a systematic review. *Journal of Public Health*, 42(3), e299-e310.
- Hobfoll, S. E. (2011). Conservation of resources theory: Its implication for stress, health, and resilience. *The Oxford Handbook of Stress, Health, and Coping*, 127, 147.
- Kamali, M., Munyuzangabo, M., Siddiqui, F. J., Gaffey, M. F., Meteke, S., Als, D., ... & Bhutta, Z. A. (2020). Delivering mental health and psychosocial support interventions to women and children in conflict settings: a systematic review. *BMJ Global Health*, 5(3), e002014.
- Kunzler, A. M., Stoffers-Winterling, J., Stoll, M., Mancini, A. L., Lehmann, S., Blessin, M., ... & Lieb, K. (2021). Mental health and psychosocial support strategies in highly contagious emerging disease outbreaks of substantial public concern: A systematic scoping review. *PloS One*, 16(2), e0244748.
- Lazieh, S. M., Tarnas, M. C., Wagner, K., Alkhatib, I., Polinori, C., Netfagi, M., ... & Burnham, G. (2025). Healthcare workers' perceptions of postoperative care and implementation challenges in conflict-affected northwest Syria: a mixed-methods analysis. *BMJ Public Health*, 3(1).
- Lopes Cardozo, B., Gotway Crawford, C., Eriksson, C., Zhu, J., Sabin, M., Ager, A., ... & Simon, W. (2012). Psychological distress, depression, anxiety, and burnout among international humanitarian aid workers: a longitudinal study.
- Maalouf, F. T., Alamiri, B., Atweh, S., Becker, A. E., Cheour, M., Darwish, H., ... & Akl, E. A. (2019). Mental health research in the Arab region: challenges and call for action. *The Lancet Psychiatry*, 6(11), 961–966.
- Oweidat, I., Omari, A., ALBashtawy, M., Alrahbeni, T., Al-Mugheed, K., & Alsheikh, A. D. I. (2024). Factors affecting the quality of working life among nurses caring for Syrian refugee camps in Jordan. *Human Resources for Health*, 22(1), 1.
- Pfortmueller, C. A., Schwetlick, M., Mueller, T., Lehmann, B., & Exadaktylos, A. K. (2016). Adult asylum seekers from the Middle East, including Syria in Central Europe: What are their health care problems? *PloS One*, 11(2), e0148196.
- Quosh, C., Eloul, L., & Ajlani, R. (2013). Mental health of refugees and displaced persons in Syria and surrounding countries: a systematic review. *Intervention Journal of Mental Health and Psychosocial Support in Conflict Affected Areas*, 11(3), 276-294.
- Rahmat, Z. S., Amar, H., Siddiqui, J. A., Mirha, H. T., Hassan, M., Essar, M. Y., ... & Hashim, H. T. (2022). Mental health impacts of humanitarian crisis on HCWs in Syria amidst COVID-19. *Medicine, Conflict and Survival*, 38(1), 23–30.

- Sá, F. H. D. L., Waikamp, V., Freitas, L. H. M., & Baeza, F. L. C. (2022). Mental health outcomes in Syrian refugees: A systematic review. *International Journal of Social Psychiatry*, 68(5), 933-953.
- Sagaltici, E., Cetinkaya, M., Nielsen, S. Y., Sahin, S. K., Gulen, B., & Altindag, A. (2022). Identified predictors and levels of burnout among staff workers in a refugee camp of first immigrant group: A cross-sectional study. *Medicine*, 11(1), 135-41.
- Shoib, S., Swed, S., Alibrahim, H., Ezzdean, W., Almoshantaf, M. B., Siddiqui, M. F., & Chandradasa, M. (2022). Mental health services in Syria: Challenges and opportunities. *Asian Journal of Psychiatry*, 76, 103246–103246.
- Spivey, S. E. (2016). Conflict and care: mixed methods research of Israeli healthcare providers and Syrian patients and their caregivers (Doctoral dissertation, University of Georgia).
- UNHCR. (2022). Syria situation - Global Focus. Retrieved from <https://reporting.unhcr.org/syria-situation-global-report-2022Global> Focus+6
- World Bank & World Health Organization. (2021). HeRAMS: Health Resources & Services Availability Monitoring System – Syria. Retrieved from <https://joomla.emro.who.int/-images/stories/syria/04-HeRAMS-Annual-Public-Hospitals-Report-2021.pdf>
- World Health Organization. (2021). HeRAMS Annual Public Hospitals Report 2021. Retrieved from <https://joomla.emro.who.int/images/stories/syria/04-HeRAMS-Annual-Public-Hospitals-Report-2021.pdf>