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Disaster Related Competencies for Healthcare Providers

A Comparative Benchmarking Study Contributing to the Development of Emergency Medical Services (EMS) Operations and Service Delivery.

الكفاءات ذات الصلة لمقدمي الرعاية الصحية

دراسة مقارنة مرجعية تسهم في تطوير عمليات خدمات الطوارئ الطبية (EMS) وتقديم خدماتها

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Abstract:

Background: Disaster education for healthcare providers requires a clearer connection between competency frameworks, assigned responsibilities and evidence of performance. Developments since 2014 include revised nursing competencies, emergency medical team standards, post-pandemic workforce frameworks and new Gulf research.
Objective: To examine how selected international frameworks and published regional studies can inform an observable, role-based approach to disaster competency development and assessment.
Methods: A qualitative documentary review with critical narrative synthesis was undertaken using purposively selected peer-reviewed articles, an academic book and official institutional publications available by 8 November 2026. Sources were compared by professional scope, competency content, assessment approach and contextual applicability. Normative expectations were distinguished from empirical findings, and access limitations were recorded. No participants were recruited and no primary data were collected.
Results: The selected evidence supports four analytical findings: shared disaster functions require profession-specific authorization; confidence and knowledge measures do not establish operational competence; individual performance depends on team and institutional conditions; and recovery and workforce protection require explicit attention. Adaptation to Gulf settings also requires attention to mass gatherings, heat, linguistic diversity and service continuity. Recent research strengthens the case for observable assessment but does not establish a universal measurement instrument or a single effective training duration. The synthesis yields a proposed matrix linking ten functional domains to observable behaviours, three responsibility profiles and assessment evidence.
Conclusion: Disaster competency development should connect a defined role to observable tasks, assessment conditions, supervision and reassessment. The proposed matrix is an analytical output for local adaptation and validation, rather than a validated scale, accreditation standard or demonstrated intervention.

Keywords: disaster competencies; healthcare workforce; emergency preparedness; competency assessment; documentary review; Saudi Arabia; Gulf countries

الملخص:

يتطلب تعليم مقدمي الرعاية الصحية في مجال الكوارث ربطًا أكثر وضوحًا بين أطر الكفاءات والمسؤوليات المحددة والأدلة التي تثبت مستوى الأداء. وتشمل التطورات التي شهدها هذا المجال منذ عام 2014 مراجعة كفاءات التمريض، ومعايير الفرق الطبية للطوارئ، وأطر القوى العاملة التي ظهرت بعد الجائحة، فضلًا عن الأبحاث الخليجية الحديثة.
الهدف :دراسة كيفية الاستفادة من مجموعة مختارة من الأطر الدولية والدراسات الإقليمية المنشورة في تطوير نهج قائم على الأدوار وقابل للملاحظة، لتنمية كفاءات التعامل مع الكوارث وتقييمها.
المنهجية :أُجريت مراجعة وثائقية نوعية باستخدام أسلوب التوليف السردي النقدي، بالاعتماد على مجموعة مختارة بصورة هادفة من المقالات العلمية المحكمة، وكتاب أكاديمي، ومنشورات مؤسسية رسمية متاحة حتى 8 نوفمبر 2026. وقورنت المصادر من حيث نطاق الممارسة المهنية، ومحتوى الكفاءات، وأساليب التقييم، ومدى ملاءمتها للسياق المحلي. كما جرى التمييز بين التوقعات المعيارية والنتائج التجريبية، وتوثيق قيود الوصول إلى المصادر. ولم يتم استقطاب أي مشاركين أو جمع أي بيانات أولية.
النتائج :تدعم الأدلة المختارة أربعة استنتاجات تحليلية رئيسية: أولًا، تتطلب الوظائف المشتركة في التعامل مع الكوارث تحديد الصلاحيات المهنية لكل تخصص؛ ثانيًا، لا تُعد مقاييس الثقة بالنفس والمعرفة دليلًا كافيًا على الكفاءة التشغيلية؛ ثالثًا، يعتمد الأداء الفردي على ظروف الفريق والمؤسسة؛ ورابعًا، يتطلب التعافي وحماية القوى العاملة اهتمامًا صريحًا ومباشرًا. كما يتطلب تكييف هذه الكفاءات مع بيئات دول الخليج مراعاة التجمعات البشرية الكبرى، وارتفاع درجات الحرارة، والتنوع اللغوي، واستمرارية الخدمات. وتعزز الأبحاث الحديثة أهمية التقييم القائم على الأداء القابل للملاحظة، لكنها لا تثبت وجود أداة قياس عالمية موحدة أو مدة تدريب واحدة فعالة لجميع السياقات. ويقدم هذا التوليف مصفوفة مقترحة تربط عشرة مجالات وظيفية بالسلوكيات القابلة للملاحظة، وثلاثة أنماط للمسؤوليات، وأدلة التقييم.

الخاتمة :ينبغي أن تربط تنمية الكفاءات في مجال التعامل مع الكوارث بين الدور المهني المحدد والمهام القابلة للملاحظة، وظروف التقييم، والإشراف، وإعادة التقييم. وتمثل المصفوفة المقترحة مخرجًا تحليليًا قابلًا للتكييف والتحقق منه محليًا، وليست مقياسًا معتمدًا أو معيارًا للاعتماد أو تدخلًا ثبتت فعاليته.

الكلمات المفتاحية :كفاءات التعامل مع الكوارث؛ القوى العاملة في الرعاية الصحية؛ التأهب للطوارئ؛ تقييم الكفاءات؛ المراجعة الوثائقية؛ المملكة العربية السعودية؛ دول الخليج.

A documentary synthesis of international frameworks and Gulf evidence through 2026

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1 Introduction and research questions

Healthcare providers may be clinically proficient in routine work yet unfamiliar with the coordination, safety and resource decisions required during a disaster. A practitioner can know a treatment protocol while being unable to locate an incident supervisor, transmit a reliable patient handover or continue documentation when electronic systems fail. Conversely, a well-written emergency plan cannot establish whether staff can perform the tasks assigned to them. These are distinct problems, and education directed only at individual knowledge leaves the connection between professional ability and organizational readiness uncertain.

Preparedness levels, communication, resource management and nursing responsibilities remain central concerns in disaster education. A contemporary account must distinguish the requirements of different professions, avoid treating management seniority as clinical authorization and explain what evidence would justify a claim of competence. It must also account for the revised International Council of Nurses (ICN) framework, the subsequent deployable-team supplement and the World Health Organization (WHO) health emergency workforce framework (ICN, 2019; ICN, 2022; WHO, 2025a).

Competency frameworks serve different purposes. The foundational cross-professional work of Walsh and colleagues established a common educational reference for disaster medicine and public health. Its continued relevance does not mean that every practitioner should undertake every disaster task. Equally, a nursing framework cannot be transferred unchanged to paramedics, physicians, pharmacists or public health personnel. Shared language facilitates collaboration; professional scope and local authority determine who may act (Walsh et al., 2012).

Arabian Gulf Journal
Humanities and Social Studies

This distinction becomes particularly important when training documents combine hospital incident management, public health career tiers and specialist response qualifications. These categories are not interchangeable. A junior clinician may possess a specialist technical skill, while a senior administrator may hold an incident coordination role without competence to deliver that clinical intervention. The present review therefore organizes its interpretation around assigned functions and evidence of performance.

Gulf evidence provides an opportunity to examine these relationships in settings that include planned mass gatherings, mobile populations and coordination across healthcare organizations. It also presents methodological limitations. Survey results often describe perceived preparedness rather than observed response, and studies from one city or profession cannot represent the entire region. A useful synthesis must preserve those limits while translating the evidence into explicit questions for workforce development.

The review addresses three questions. First, which common disaster functions recur across selected international competency and workforce frameworks? Second, what do recent empirical studies and reviews, particularly from Saudi Arabia and other Gulf settings, establish about preparedness and its measurement? Third, how can these sources inform a practical competency and assessment matrix without presenting an untested proposal as a validated standard?

2 Methods

2.1 Design and analytical purpose

This study is a qualitative documentary review with a critical narrative synthesis. It examines published documents as evidence about how disaster competence is conceptualized, organized and assessed. Documentary analysis provides a way to compare institutional texts and research reports while considering their purpose and context. The study does not estimate an intervention effect, calculate a pooled prevalence or claim exhaustive coverage of all disaster education research (Bowen, 2009).

The review compared foundational concepts with contemporary frameworks and studies. Older sources were included when they clarified the disciplinary background, while current operational claims required directly relevant evidence. An academic disaster nursing book informed the historical context, with its accessible publisher description and contents distinguished from full-book analysis (Powers & Daily, 2010).

2.2 Source identification

Targeted online searches and citation following were completed on 8 November 2026. The search combined disaster or health emergency terms with competency, healthcare provider, nursing, paramedic, emergency medical team, assessment, preparedness, Saudi Arabia, Qatar, Oman and Gulf. Specific follow-up searches addressed revised frameworks, 2025–2026 publications and measurement properties. Publisher websites, bibliographic records and the official websites of WHO and ICN were used to resolve sources and confirm bibliographic details.

Examples of the search combinations were “disaster healthcare providers competencies 2026”, “disaster nursing competencies Saudi Arabia”, “emergency medical teams competency framework”, and “disaster competency self-assessment measurement properties”. These were targeted discovery searches, not a reproducible multi-database systematic search. The review was not prospectively registered, and no PRISMA screening totals or independent duplicate screening are claimed.

Sources were selected when they directly addressed disaster competency content, workforce organization, assessment or an informative Gulf application. Foundational material predating the update period was eligible where it clarified the development of the field. Recent work received attention because of its content and relevance, rather than publication year alone. General leadership or behavioural health texts were not used as substitutes for evidence about disaster-specific skills.

2.3 Access and source verification

Journal titles, author details, years, volumes and identifiers were checked against publisher information and publisher-deposited DOI metadata where available. Publication-year conventions require care: two BMC papers appeared online in December 2025 but carry 2026 volume and version-of-record citations. They are cited here as 2026, following their final journal citation. A DOI containing "2025" does not itself establish the citation year (Alqahtani & Toloo, 2026; Beckert et al., 2026).

Full texts were examined where accessible. Some sources were available only as abstracts, book descriptions or institutional publication overviews. Those sources were used only for claims supported by the accessible material. The access record in Appendix A identifies the principal evidential limits. A web page describing a standard was not treated as equivalent to having examined every technical requirement in the standard.

2.4 Documentary extraction and synthesis

Documents were compared using a common set of questions: who is the intended professional or institutional user; which disaster functions are described; what responsibility or proficiency distinctions are made; how is competence assessed; what type of evidence is reported; and what conditions limit application elsewhere? Each source was also classified as normative guidance, empirical research, evidence synthesis, methodological literature or historical background.

The interpretation proceeded through comparison of recurring functions and contrasting forms of evidence. Initial categories included preparation, command and coordination, communication, safety, clinical response, ethical judgment and recovery. Cross-cutting questions concerned workforce support, information systems and assessment. Related concepts were grouped into four analytical findings and then translated into the proposed domain matrix. This was interpretive synthesis, not a formal Delphi exercise, psychometric analysis or statistically tested taxonomy.

For empirical studies, interpretation considered design, sampling, self-report, temporal sequence and outcome definition. For reviews, attention was given to their search period and included populations. For guidance, institutional mandate and intended level of application were considered. The reporting approach was informed by the SANRA emphasis on clear aims, source identification and scientific reasoning; no SANRA score was calculated (Baethge et al., 2019). Formal numerical risk-of-bias scores, inter-coder agreement and GRADE certainty ratings were not generated in this review. Their absence limits the strength of comparative conclusions.

2.5 Research ethics and data

The review used published sources and involved no recruitment, interviews, questionnaires, patient records or identifiable personal datasets. No ethics approval number or institutional exemption is claimed. Any future field assessment of staff, collection of identifiable performance records or linkage to patient outcomes would require an appropriate institutional determination before data collection. The tables in this paper are analytical proposals and contain no participant results.

3 Evolution of the evidence base

3.1 Foundational concepts and the limits of generic tiers

Historical disaster nursing literature placed clinical care within a wider response involving coordination and continuity. The publisher description and contents of International Disaster Nursing illustrate the breadth of this disciplinary perspective. They are useful for historical context, but an older textbook cannot establish current operational requirements or support an assertion that a particular course is sufficient in 2026 (Powers & Daily, 2010).

The ICN 2019 framework differentiates general nurses, designated responders and deployable specialists, while presenting eight competency domains. Its Level I and II content should be distinguished from the later Level III supplement. These levels describe nursing expectations, not a universal three-tier hierarchy for every healthcare occupation. An earlier scoping review also identified recurring nursing competency domains while calling for clearer specification of fundamental abilities within them (Al Thobaity et al., 2017; ICN, 2019).

For this synthesis, the implication is methodological: similar domain names do not prove equivalent responsibilities. “Assessment” may refer to an individual patient, an incident situation or a population-level risk analysis. Comparison must therefore specify the object of the action and the authority under which it occurs. A shared framework is useful when it clarifies these relationships and less useful when broad labels conceal them.

3.2 Contemporary workforce and organizational frameworks

The World Health Organization (WHO) Health Emergency and Disaster Risk Management framework places health action across prevention, preparedness, response and recovery. This supports analysis beyond a hospital’s immediate response phase. It does not turn every healthcare worker into an emergency manager, but it provides a system context in which individual functions can be located (WHO, 2019).

The 2021 WHO emergency medical team publication addresses team classification and minimum standards. The ICN Level III supplement subsequently articulated competencies for nurses deployed within established teams. Together, these sources reinforce the need to distinguish individual preparation from collective capability. A clinician’s skill does not by itself establish team logistics, referral arrangements or authorization for deployment (ICN, 2022; WHO, 2021).

WHO’s 2025 Global Health Emergency Corps framework emphasizes the organization and connection of emergency workforces and surge mechanisms. Its relevance here is the relationship between personnel, expertise and coordination. It is not an individual licensing curriculum. Similarly, the 2026 framework for national public health agencies concerns institutional capabilities and mandates; its functions should inform interface requirements rather than be copied wholesale into a bedside competency checklist (WHO, 2025a; WHO, 2026).

3.3 What publications in 2026 add

The 2026 consensus update by Burke and colleagues examined proposed changes to the earlier disaster medicine and public health competencies. Twenty experts informed the initial process, and 16 respondents completed the Delphi items. The adopted revision focused on identifying physical, psychological and security hazards and explaining associated risks. This is a focused change to an

existing foundation, not evidence that all previous competencies were replaced or that training effectiveness was demonstrated (Burke et al., 2026).

Woodward and colleagues' 2026 scoping review identified 54 studies addressing disaster medical specialist preparation across physicians, nurses and paramedics. Its accessible abstract describes convergence around core functions alongside variation in training approaches and duration. The searches were conducted in September 2024. Accordingly, a 2026 publication date does not mean that the underlying literature covers all developments through 2026, nor does this review establish one universally adequate course length (Woodward et al., 2026).

The measurement review by Beckert and colleagues examined eight self-assessment instruments using COSMIN-based methods. No instrument met the requirements for an unreserved recommendation. Responsiveness, measurement error and criterion validity were not evaluated in the included studies. This finding argues for restraint when using a total questionnaire score to certify disaster readiness; it does not establish that all existing tools are useless for educational needs assessment (Beckert et al., 2026).

The combined interpretation is that the field has stronger frameworks and a clearer account of measurement limitations, while important validation problems remain. Updating a manuscript to 2026 therefore requires more than adding recent citations. It requires narrowing claims to the evidence that a framework, consensus process, survey or assessment study can actually provide.

4 Saudi and Gulf evidence

4.1 Saudi healthcare and paramedic research

The Saudi EMS study by Almukhlifi and colleagues surveyed 272 workers using the Disaster Preparedness Evaluation Tool. Its accessible abstract reports associations between preparedness and characteristics including experience and education. These results identify relationships in a defined sample; they are not direct observations of disaster performance or evidence that education caused the reported differences (Almukhlifi et al., 2024).

Alqahtani and Toloo's review, cited in its 2026 final volume, included 16 studies. The literature was concentrated in Riyadh and Makkah, with relatively few interventional studies and limited exclusive attention to paramedics or paramedic students. This distribution supports a research gap about performance and transferability. It does not justify describing all Saudi paramedics as equally prepared or unprepared (Alqahtani & Toloo, 2026).

Mersal and colleagues' 2026 study analyzed responses from 490 nurses in four Saudi settings. Respondents reported generally favourable competency levels, with preparedness the lowest-scoring domain. Competency was associated with resilience and selected professional characteristics. Self-report, convenience recruitment within facilities and a cross-sectional design limit causal and national interpretation. This evidence is informative for training priorities, but cannot confirm competence under operational stress (Mersal et al., 2026).

These studies concern different populations and instruments. Their scores should not be ranked as though they share a common calibrated scale. The analytical issue is whether the reported construct corresponds to the intended workforce decision. Confidence may help identify a perceived need; deployment authorization requires additional evidence about the actual assignment.

4.2 Hajj and planned mass gatherings

Alrabie and colleagues' 2025 systematic review included 23 studies and organized the literature around preparedness, response challenges and education. It supports continued attention to training and role clarity in the Hajj setting. Heterogeneous studies and outcomes limit any assertion that one programme or educational format produces a specified improvement in patient outcomes (Alrabie et al., 2025).

For the proposed framework, a planned mass gathering is an assessment context involving interacting demands, rather than a competency in itself. A heat-related surge, for example, can test recognition and escalation, communication across services and continuity for patients whose routine care is disrupted. The exact clinical actions, thresholds and authority must come from the applicable local protocols.

A multilingual population also changes the conditions under which competence is demonstrated. A technically correct instruction may fail if the recipient cannot understand it or locate the service to which it refers. An exercise should therefore examine whether the worker identifies a communication barrier, obtains appropriate assistance and confirms the next step. It should not assume that speaking English or Arabic alone establishes communication competence for all affected people.

4.3 Qatar and Oman

Elshami and colleagues' 2026 Qatar study combined 403 valid questionnaire responses with six focus groups involving 41 healthcare practitioners. Participants reported favourable perceptions in several areas but less frequent practical disaster activity. The study concerns perceptions and reported practice, rather than directly observed capability. Its mixed-methods design helps illuminate organizational conditions, while its setting and design constrain transfer to other health systems (Elshami et al., 2026).

The accessible institutional record of Qutishat and Al Ali's 2025 Oman study describes a cross-sectional survey of 207 nurses examining preparedness and burnout. It supports consideration of workforce wellbeing alongside preparedness. It does not show that a training intervention prevents burnout or that an individual's resilience compensates for unsafe staffing or inadequate organizational support (Qutishat & Al Ali, 2025).

Together, the regional studies suggest that willingness, confidence, practical exposure and organizational support should be examined separately. Gulf adaptation should begin with the actual assignment, population and institutional interface. Shared regional characteristics are grounds for comparison, not proof that one national sample represents another.

Table 1 Selected empirical and review evidence

Source	Evidence and population	Contribution to the synthesis	Main interpretive limit
Hung et al 2024	Literature mapping and expert survey	Leadership and decision-making belong in workforce planning	International mapping is not a local performance assessment
Almukhlifi et al 2024	Cross-sectional survey of 272 Saudi EMS workers	Preparedness varies with professional and workplace characteristics	Accessible abstract and self-report

Source	Evidence and population	Contribution to the synthesis	Main interpretive limit
Alrabie et al 2025	Systematic review of 23 Hajj-related studies	Training and response challenges require contextual attention	Heterogeneous populations and measures
Qutishat and Al Ali 2025	Survey of 207 nurses in Oman	Preparedness should be considered alongside wellbeing	Institutional abstract and cross-sectional associations
Alqahtani and Toloo 2026	Review of 16 Saudi paramedic-related studies	Geographic and intervention evidence gaps	Search to August 2024 and mixed populations
Beckert et al 2026	Review of eight self-assessment instruments	Measurement claims require explicit qualification	Nursing tools and unevaluated measurement properties
Mersal et al 2026	Survey of 490 Saudi nurses	Preparedness and resilience can be studied jointly	Self-report and sampling constraints
Elshami et al 2026	Qatar survey and focus groups	Perceived readiness and practical activity may differ	No direct operational observation
Woodward et al 2026	Review of 54 specialist preparation studies	Shared content coexists with training variation	Accessible abstract and search to September 2024

5 Findings of the documentary synthesis

5.1 Common functions require different authorizations

The first analytical finding is a distinction between shared disaster functions and authorized professional actions. Preparation, communication, safety, coordination and recovery recur across the selected sources, but their expression depends on the assignment. International mapping also places decision-making and leadership within the competency discussion, rather than restricting preparedness to technical procedures (Hung et al., 2024).

The practical consequence is that a competency statement should identify an actor, an action and its conditions. "Understands incident command" is an educational topic. "Identifies the assigned supervisor, reports the incident through the designated route and acknowledges the resulting task"

describes a behaviour that can be examined. The latter still requires local specification of the actual command arrangement.

A common educational foundation can therefore coexist with restricted technical responsibilities. For a suspected hazardous exposure, many staff may be expected to recognize danger and initiate the authorized escalation process. Entry into a hazardous area or operation of specialist equipment requires a separate assignment and verified preparation. The framework proposed below does not make these activities universal duties.

5.2 Preparedness measures answer different questions

The second finding concerns construct clarity. Attendance, knowledge, confidence, willingness and demonstrated performance are related but different. A certificate establishes participation or achievement under a specified course's conditions. It cannot, without additional evidence, establish retention, transfer to the workplace or competence during a different hazard.

Questionnaires remain useful when their purpose is explicit. They can identify uncertainty, perceptions of institutional support or reported training needs. Their interpretation becomes problematic when a favourable total is used as proof of operational readiness. The measurement limitations identified in the recent review reinforce the need to explain what decision a score can support (Beckert et al., 2026).

This synthesis consequently separates educational diagnosis from authorization. A low confidence score may justify discussion and learning support. A high score does not remove the need to observe a safety-critical task. Likewise, a failed exercise should prompt analysis of equipment and system conditions before attributing the result solely to the worker.

5.3 Individual competence depends on team and system conditions

The third finding is that individual and organizational readiness must be assessed together but reported separately. A provider may perform a handover correctly while the receiving channel fails. A team may identify a need but lack transport or referral capacity. Classifying either event simply as an individual competency failure obscures the corrective action.

The proposed interpretation distinguishes knowledge and skill from opportunity, authority and resources. A documented performance gap should record which of these was absent. If an institution expects staff to use a backup communication method, it must make that method available and ensure that a receiving function exists. Training cannot correct a missing operational arrangement on its own.

This relationship also explains why institutional capability frameworks should not be converted directly into employee appraisal forms. Agency financing, laboratory capacity or national surveillance arrangements are organizational capabilities. A practitioner may need to understand how to access or contribute to them, while responsibility for establishing them rests elsewhere.

5.4 Recovery and workforce protection require contextual adaptation

The fourth finding is a need to carry preparedness beyond the initial response. Recovery requires continuity, referral, documentation, follow-up and organizational learning. It also involves identifying the support needed by staff affected by the event. These functions should be explicit in role descriptions rather than assumed to occur once immediate demand declines.

Physical safety, psychological strain and security risks should be considered throughout an assignment. The recent consensus update gives a specific basis for strengthening hazard identification, while

regional evidence raises questions about wellbeing and participation. Neither source permits an institution to transfer its duty of workforce protection to an individual resilience score (Burke et al., 2026; Qutishat & Al Ali, 2025).

The resulting model links capability development with a learning cycle: define the task, provide the conditions, examine performance, correct the identified gap and reassess. This is a conceptual inference from the documentary comparison. Its effectiveness must be evaluated rather than asserted.

6 Proposed competency and assessment framework

6.1 Responsibility profiles

The proposed framework uses three responsibility profiles to distinguish tasks. They are analytical categories developed for this review, not renamed ICN levels or national credentialing grades. A person may hold more than one profile depending on the assignment.

The common foundation applies to healthcare workers within the emergency plan. It includes role recognition, notification, safe conduct, essential communication and continuity within scope. The designated responder profile adds responsibilities explicitly allocated in the emergency plan, such as coordinating a patient stream, applying an approved triage process or managing a functional team. The specialist or incident leadership profile requires additional verification for a defined technical or coordination assignment.

These profiles should not be ordered solely by seniority. Technical specialization and command responsibility are different dimensions. Local adoption should therefore specify whether a requirement concerns specialist clinical practice, functional coordination, strategic decision-making or more than one of these.

Table 2 Proposed functional domains and observable evidence

Domain	Example observable behaviour	Suggested assessment evidence
Risk and preparation	Identifies relevant hazards and explains the assigned notification and reporting route	Brief scenario and retrieval of the current role instructions
Coordination and role boundaries	Confirms the supervisor and assignment and escalates a task beyond authority	Team exercise with decision and handover records
Communication and information integrity	Sends a concise verified handover and distinguishes confirmed information from uncertainty	Observed communication task with an alternate channel
Safety and exposure control	Recognizes an unsafe condition and follows the authorized protection or escalation procedure	Direct observation in a locally approved safety scenario

Domain	Example observable behaviour	Suggested assessment evidence
Clinical prioritization	Applies the locally authorized prioritization process within professional scope	Profession-specific case assessment with justified reassessment
Surge and continuity	Identifies a capacity constraint and uses the approved referral or continuity pathway	Linked patient-flow exercise and documented receiving response
Ethical and inclusive practice	Explains an authorized decision and identifies language or access needs	Case discussion supported by an observable communication task
Psychological and workforce support	Recognizes distress or fatigue and initiates the appropriate support or relief route	Scenario observation with supervisor follow-up
Digital continuity and technology oversight	Uses the downtime process and checks the source and limitations of automated output	Simulated system outage with record reconciliation
Recovery and learning	Completes a reliable follow-up handover and links an identified gap to a corrective action	Recovery exercise and review of action closure

The domain selection draws on nursing competency content and cross-professional mapping, while digital oversight is informed by the WHO AI guidance (Hung et al., 2024; ICN, 2019; WHO, 2024). The examples are original operationalizations proposed by this review. They are not verbatim ICN requirements or a complete reproduction of any source framework. The matrix combines recurring functions with an assessment-oriented interpretation and requires profession-specific content review before implementation.

6.2 Hazard and context modules

An all-hazards foundation should be supplemented by modules relevant to the local risk assessment and assigned responsibilities. Possible contexts include mass casualty demand, infectious threats, hazardous materials, extreme heat, infrastructure interruption and evacuation. A hazard module should specify which workers require awareness, which require practical verification and which need specialist authorization.

Climate-related preparedness illustrates the distinction between a hazard topic and a workforce task. WHO's facility guidance addresses resilience and resource conditions at the institutional level. For a worker, the relevant observable requirement may be recognizing a service disruption, escalating it and

applying the approved continuity procedure. The worker is not thereby responsible for engineering the facility's water or energy resilience (WHO, 2020).

A hazardous-material module should likewise distinguish recognition and avoidance from specialist response. Blanket requirements for every healthcare provider to use a particular category of protective equipment or perform decontamination are inappropriate without task, hazard and authorization analysis. This review proposes that those decisions be made locally rather than prescribing a universal equipment requirement.

6.3 Digital systems and artificial intelligence

A 2026 update should address both technology use and safe work when technology fails. Proposed behaviours include verifying the current information source, recording uncertainty, preserving confidentiality, using an approved downtime process and reconciling records after restoration. These are competency proposals, not evidence that a particular digital system improves disaster outcomes.

WHO's guidance on large multimodal models identifies governance concerns relevant to healthcare uses of generative artificial intelligence. Its discussion of risks supports attention to oversight, rather than endorsement of an autonomous disaster decision tool. The proposed worker-level requirement is to check consequential output, recognize limitations and use the authorized escalation route (WHO, 2024).

Training should test whether staff continue to exercise judgment when an automated recommendation conflicts with other available information. A simulated exercise can introduce an incorrect output and examine whether the worker questions it and documents the issue. No real patient information is needed for such a training scenario. Any subsequent research evaluating its effect would require an appropriate protocol.

6.4 Inclusion and communication

Inclusive practice should be evaluated as part of task completion. An assessor can examine whether staff identify a barrier, access an appropriate communication resource and confirm the recipient's understanding. Translation alone does not establish accessibility, particularly when disability, distress or unfamiliarity with the service changes what assistance is needed.

For a Gulf application, scenario designers should consider residents, visitors, older people and people whose ongoing treatment depends on services outside the immediate incident site. These are proposed design considerations. They do not imply measured prevalence of a particular access problem or establish that a single training package will address every population.

7 Assessment and educational implementation

7.1 An assessment programme rather than a single score

Assessment should be designed around the decision it is intended to support. A needs assessment, course completion decision, assignment authorization and organizational readiness review require different evidence. Combining them into one total obscures whether an identified problem concerns knowledge, performance, resources or governance.

The proposed programme begins with a documented task analysis. Educators identify the assigned actions, relevant conditions and consequences of error. Assessors then select methods capable of examining those actions. Written questions can examine reasoning; direct observation can examine a

Arabian Gulf Journal
Humanities and Social Studies

procedure; team simulation can examine coordination. No single method adequately represents every domain.

A portfolio may combine these forms of evidence, but should not become a collection of attendance certificates. Each entry should specify the task, conditions, assessor, observed result, required supervision and any reassessment. Evidence from routine work can be relevant when it reflects the same function, but should not be assumed to cover rarely encountered disaster conditions.

7.2 Training design and retention

WHO's National Health Simulation Exercise Programme guidance supports sustained exercise programmes rather than isolated activities. Its relevance is organizational: exercises should connect preparation and learning over time. The institutional publication overview does not establish a universal frequency, passing score or training dose for every healthcare worker (WHO, 2025b).

The proposed educational sequence is conditional. Initial learning addresses the defined gap; practice allows feedback; assessment examines the required task; and subsequent reassessment considers retention and changing responsibilities. The timing should reflect risk, practice opportunities, equipment change and evidence of performance rather than an arbitrary schedule introduced by this paper.

Simulation fidelity should match the learning and assessment objective. A short communication exercise may be sufficient to examine a handover route, while a linked exercise may be needed to test referral and receiving capacity. Expensive technology is not, by itself, evidence of educational quality. Scenario conditions, assessor preparation and useful feedback remain central design requirements.

7.3 Decisions and safety-critical actions

A proposed assessment record can distinguish "demonstrated under the stated conditions", "requires supervised development", "not demonstrated" and "not assessed". These labels describe the available evidence; they are not a validated scoring scale. A missing observation should not be coded as success or silently removed from the denominator.

Before assessment, competent local reviewers should identify actions whose failure requires stopping the exercise or withholding authorization. A favourable aggregate result should not compensate for an unresolved safety-critical error. Equally, an equipment failure should be recorded as a system condition rather than automatically scored as an individual failure.

Assessors require shared guidance and calibration. They can independently judge the same recorded or simulated performance and discuss inconsistent interpretations. A future validation study could estimate inter-rater agreement and investigate why disagreement occurs. This review does not report such agreement because no assessment participants or raters were studied.

Table 3 Proposed scenarios and assessment boundaries

Illustrative scenario	Functions examined	Evidence to retain	Boundary
Mass gathering with heat-related demand and language barriers	Notification, role confirmation, prioritization and coordinated referral	Action sequence, handover and receiving confirmation	Clinical criteria and transport authority come from local protocols
Suspected hazardous exposure at a receiving facility	Hazard recognition, safe escalation and specialist referral	Observed recognition, communication and protection decisions	Specialist entry or decontamination is assessed only for authorized roles
Electronic outage during a surge with later recovery	Downtime communication, patient identification and reconciliation	Temporary records, discrepancy resolution and recovery handover	Fictional training records and approved information-security arrangements

7.4 Implementation responsibilities

An institution adapting the matrix should assign ownership across emergency management, professional leadership, education and quality functions. Emergency management defines the incident interface; professional leadership confirms scope; educators design learning; and quality staff help connect findings to corrective actions. The exact arrangement depends on the institution's mandate and should be recorded.

The first implementation step is to compare current role descriptions with the proposed functions. The next is to identify a manageable set of high-consequence tasks and assess whether the required equipment, communication routes and receiving services exist. Training should not be scheduled as the sole response when the underlying gap is a missing system.

A pilot should examine feasibility and fairness before wider use. It should record assessment duration, staffing requirements, unavailable equipment, language needs and reasons for non-completion. Staff should have a clear route for feedback and review of consequential decisions. The proposed matrix has no authority to alter professional licensing or employment requirements.

8 Evaluation and research agenda

8.1 Measuring implementation without overstating impact

Evaluation should separate training delivery, individual performance, team coordination and service outcomes. Completion rates describe programme reach. Observed task performance describes

Arabian Gulf Journal
Humanities and Social Studies

behaviour under specified conditions. Patient or population outcomes require additional data and an analytical design that addresses competing explanations.

Useful process indicators may include the proportion of assigned staff with current task evidence, the proportion of safety-critical gaps resolved before assignment and the proportion of corrective actions verified as complete. Definitions should specify the eligible population and observation window. No numerical target is proposed here because the documentary evidence does not establish a universally appropriate threshold.

Changes in a questionnaire score can be reported as changes in that measured construct. They should not be relabelled as reduced mortality, improved operational response or validated competence. A pre–post study without a comparison condition may also reflect familiarity with the assessment, selection or other changes occurring during the same period.

8.2 Validation priorities

The first research priority is content validity. Practitioners, educators, emergency managers and relevant service users should assess whether the proposed tasks are relevant, sufficiently comprehensive and understandable. This review's documentary derivation is a starting point for that work, not a substitute for it.

The second priority is the interpretation of assessment decisions. Researchers should examine assessor agreement, variation across scenarios and evidence needed to support the proposed assignment. A checklist that performs consistently in one simulated context may not generalize to a different hazard or institution. Measurement error and responsiveness deserve attention because their absence limits interpretation of change.

The third priority is transfer and retention. Future studies should distinguish immediate educational gains from later task performance. Multicentre work could include different professions and non-urban facilities, while analyzing contextual differences rather than treating them as noise. Comparison of educational approaches should specify the task and assessment conditions, not simply compare course names.

8.3 Gulf research questions

Several questions follow from the regional evidence. Do workers who report high readiness demonstrate the required tasks under observation? Which communication failures arise from individual skill and which from unavailable services? How does participation differ across hospital, prehospital and community roles? What support is needed to maintain safe participation through an extended response?

For Saudi Arabia, the geographic concentration of the paramedic literature makes broader settings a useful research priority. For cross-Gulf comparison, a common scenario can support discussion only if role authority, assessment language and service conditions are documented. A shared instrument should not be assumed equivalent across languages or occupations without examining its interpretation.

Technology research should evaluate human oversight and continuity, alongside potential efficiency. A digital assessment system may simplify record keeping but introduce access, privacy or interoperability problems. These are testable questions, and claims of improvement should follow evaluation rather than precede it.

9 Discussion

The principal contribution of this synthesis is an explicit connection between competency statements and the evidence needed for a decision about work. The reviewed literature provides substantial content guidance, while recent measurement research limits what can be inferred from available self-assessment tools. The proposed response is to define observable actions and conditions rather than add another undifferentiated list.

Preparedness develops through education and practice, but generic tiers cannot adequately describe the responsibilities of every provider. Responsibility profiles instead connect an assignment with its scope, supervision and assessment. The same person can require basic preparation for one function and specialist verification for another.

The distinction between individual competence and organizational capability also changes how failures are interpreted. If the referral route is unavailable, repeating an individual's training may not resolve the problem. If the route exists but the worker cannot use it, a focused learning response may be appropriate. A framework becomes operationally useful when it identifies who must correct which condition.

There are tensions in this approach. Detailed task specifications can become burdensome and overly narrow. Over-standardization may reward checklist completion while missing judgment in unfamiliar conditions. Conversely, broad descriptions can produce inconsistent decisions. Local adoption should therefore balance a limited set of critical observable actions with case-based reasoning and an explicit account of uncertainty.

The recent literature does not support a claim that consensus on domains has solved assessment. A framework may be widely recognized yet lack evidence for a particular passing score. A tool may show internal consistency without establishing prediction of response performance. These are separate claims, and research should report them separately.

For Gulf systems, adaptation should preserve this evidential discipline. Mass gathering experience and institutional resources are valuable contexts for development, but they do not remove the need to examine workforce variation or the conditions of actual practice. The matrix offers questions and a structure for evaluation; it does not establish national compliance or rank countries.

10 Limitations

This is a purposive documentary synthesis, not a systematic review. Search-engine coverage, English-language emphasis, source selection and access constraints may have excluded relevant studies, including Arabic institutional material. The source ledger improves transparency but does not make the search exhaustive.

The corpus contains nursing-heavy evidence, and fewer directly comparable observations across physicians, paramedics and other occupations. Several regional studies are cross-sectional and rely on self-report. Some source claims were available only in abstracts or institutional overviews. Different populations, instruments and time periods prevent straightforward pooling or ranking.

The proposed ten-domain matrix, responsibility profiles and assessment records were not examined by a consensus panel or tested with healthcare workers. No reliability, validity, responsiveness or implementation-effect estimate is reported. Application requires local scope review, institutional

approval and an evaluation plan. The 2026 cutoff indicates when sources were checked, not proof that every relevant publication available by that date was identified.

11 Conclusion

Contemporary disaster competency development requires a link between professional responsibilities, observable behaviour and the conditions needed for safe performance. Selected international frameworks provide shared content, while recent Gulf studies identify useful preparedness questions and important measurement limits. Perceived readiness should inform educational diagnosis without being treated as equivalent to demonstrated competence.

The proposed matrix translates the documentary synthesis into ten functional domains and three responsibility profiles. Its contribution is a transparent structure for role definition, assessment design and corrective learning. Further content review and field validation are required before it can support consequential workforce decisions.

Declaration of generative AI assistance

ChatGPT was used to assist literature discovery, source comparison, manuscript organization and drafting, including substantive text generation. The submitted manuscript requires human author review of the interpretation, references and final wording. AI assistance does not constitute authorship, independent expert validation or approval of the work.

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Appendix A Source access and documentary interpretation

The records below identify the access level used for the central sources. Availability of a full text does not mean that the present review independently reproduced the original analysis. Institutional overviews support only the statements available in those overviews.

Source group	Access examined	Use and limit
Powers and Daily 2010	Publisher description, contents and bibliographic record	Historical disciplinary context; no claim of full-book analysis
Walsh et al 2012	Publisher abstract and bibliographic record	Cross-professional foundation; not a deployment credential
Al Thobaity et al 2017	Author-institution abstract and citation	Historical domain discussion; no reanalysis of included studies
ICN 2019 and 2022	Official full reports	Scope and responsibility distinctions; not a verbatim reproduced checklist
WHO 2019 and 2021	Official reports and publication overviews; framework and coordination sections	System and team context; not a complete technical compliance assessment
WHO 2020 and 2024	Climate publication overview and AI report executive summary	Facility and AI governance context; not worker-level validation evidence
WHO 2025 and 2026	Official reports; executive summaries and introductory framework sections	Workforce, exercises and agency capability context

Source group	Access examined	Use and limit
Hung et al 2024	Publisher full text; license correction checked	International mapping; not local performance evidence
Almukhlifi et al 2024	Publisher abstract	Defined Saudi EMS sample and associations
Alrabie et al 2025	Publisher full text	Hajj evidence synthesis; heterogeneous measures
Qutishat and Al Ali 2025	Author-institution abstract	Preparedness and burnout association; no causal claim
Alqahtani and Toloo 2026	Publisher full text	Saudi paramedic literature distribution; final citation year verified
Beckert et al 2026	Publisher full text	Measurement properties; final citation year verified
Burke et al 2026	Indexed and publisher abstract information	Focused consensus revision; no training-effect claim
Mersal et al 2026	Publisher full text	Self-reported nursing competency and resilience
Elshami et al 2026	Publisher full text	Perceptions and organizational context
Woodward et al 2026	Publisher abstract and bibliographic record	Specialist preparation synthesis; full text not examined
Bowen 2009 and Baethge et al 2019	Method description and full SANRA article respectively	Documentary method and narrative reporting orientation

Arabian Gulf Journal
Humanities and Social Studies

Appendix B Proposed competency evidence record

This record is a proposed implementation aid rather than a validated research instrument. It should be adapted to professional scope, local protocols and the purpose of the assessment.

Record field	Information required
Assignment	Profession, role, responsibility profile and supervisor
Task	Observable action and relevant domain
Conditions	Scenario, equipment, information and available support
Standard	Locally reviewed expected performance and critical actions
Evidence	Observation, knowledge task, team exercise or documented work
Result	Demonstrated under stated conditions, supervised development required, not demonstrated or not assessed
System constraints	Unavailable equipment, failed communication route or missing authority
Assessor	Identity, preparation and basis of judgment
Development plan	Specific learning or system correction and responsible owner
Reassessment	Required task evidence, trigger and decision authority
Record governance	Access permission, retention rule and review route

The record should preserve the distinction between an individual development need and an institutional condition requiring correction. Completion of the form does not itself establish readiness.

Appendix C Example assessment development sequence

C1 Define the decision

Specify whether the assessment supports a learning plan, supervised practice or a particular assignment. Identify who has authority to make that decision. Avoid using a general educational result for a consequential purpose it was not designed to support.

C2 Select and review tasks

Select tasks from the local role analysis and the proposed domains. Professional reviewers confirm scope and the relevant protocol. People familiar with the setting check whether the task can be completed using the actual resources and communication arrangements.

C3 Pilot the assessment

Use fictional scenarios and test the clarity of instructions, assessor judgments and record requirements. Examine accessibility and reasons for missing evidence. Record implementation burden rather than assuming the design is feasible.

C4 Evaluate and revise

Investigate inconsistent judgments and unintended effects. Revise ambiguous requirements and repeat the relevant checks. A future research protocol can examine validity and reliability, but no such findings are supplied by this documentary review.

C5 Maintain the evidence

Review task requirements when responsibilities, equipment, protocols or hazards change. Link identified gaps to corrective actions and verify their completion. Keep records proportionate to the decision and protect identifiable workforce information.