



Oct 12, 2025

Governance, Leadership, and Decision-Making Structures in Distributed Academic Health Systems: A Scoping Review Protocol

DOI

<https://dx.doi.org/10.17504/protocols.io.n2bvjejbngk5/v1>

Jukha Shater Al Marzooqi¹, Khadija Mohd AlSulaimi², Mersiha Kovacevic³, Raed Rafeh⁴, Sara Kazim⁵, Wail Bamadhaf⁶, Zeyad Alrais⁷, Aysha Alsharhan⁸, Nabil Zary³

¹Al Jalila Children's Specialty Hospital, Dubai Health; ²Latifa Hospital, Dubai Health;

³Institute of Learning, Mohammed Bin Rashid University of Medicine and Health Sciences, Dubai Health;

⁴DAI, Dubai Health; ⁵Emergency Medicine Department, Dubai Health;

⁶Graduate Medical Education, Mohammed Bin Rashid University of Medicine and Health Sciences, Dubai Health;

⁷Critical Care Department, Dubai Health; ⁸Hamdan Bin Rashid Cancer Hospital, Dubai Health

NeuroInk



Nabil Zary

Mohammed Bin Rashid University of Medicine and Health Scienc...

Create & collaborate more with a free account

Edit and publish protocols, collaborate in communities, share insights through comments, and track progress with run records.

Create free account

OPEN  ACCESS



DOI: <https://dx.doi.org/10.17504/protocols.io.n2bvjejbngk5/v1>

Protocol Citation: Jukha Shater Al Marzooqi, Khadija Mohd AISulaimi, Mersiha Kovacevic, Raed Rafeh, Sara Kazim, Wail Bamadhaf, Zeyad Alrais, Aysha Alsharhan, Nabil Zary 2025. Governance, Leadership, and Decision-Making Structures in Distributed Academic Health Systems: A Scoping Review Protocol. **protocols.io**

<https://dx.doi.org/10.17504/protocols.io.n2bvjejbngk5/v1>

License: This is an open access protocol distributed under the terms of the **Creative Commons Attribution License**, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited

Protocol status: Working

We use this protocol and it's working

Created: October 12, 2025

Last Modified: October 12, 2025

Protocol Integer ID: 229615

Keywords: organizational governance, distributed academic health systems, governance, leadership, multi-campus, academic health systems, organizational structure, decision-making, scoping review, protocol, structures in distributed academic health system, advisory panel of academic health system leader, distributed academic health system, academic health system, processes within academic health system, academic health system leader, leadership framework, medical school, regional campus, medical education, faculty satisfaction, leadership structure, governance structure, leadership model, governance mechanism, governance approach, significant variation in governance approach, structures to educational quality, detail governance structure, shared governance, organizational model, grey literature that detail governance structure, educational capacity, organizational design, literature on governance, regional healthcare demand, based organizational design, review of organizational model, educational quality, clinical train

Abstract

Introduction: Academic health systems worldwide are adopting multi-campus and distributed models to boost educational capacity, address workforce shortages, and fulfill regional healthcare demands. Recent surveys show that over 30% of U.S. medical schools currently have regional campuses, with similar growth seen internationally. Despite this, governance structures overseeing these complex, geographically dispersed systems are not well understood. A 2023 review of organizational models in medical education revealed significant variation in governance approaches, but there is limited empirical evidence connecting these structures to educational quality, faculty satisfaction, or sustainability. Clarifying how multi-campus academic health systems coordinate decision-making, delegate authority, maintain quality, and allocate resources across sites is crucial for developing effective, evidence-based organizational designs.

Purpose: This scoping review systematically examines and summarizes the existing literature on governance and leadership frameworks within multi-campus academic health systems, aiming to identify organizational models, strategies for implementation, reported outcomes, and areas lacking sufficient knowledge.

Methods: Following the Arksey and O'Malley framework, enhanced by Levac et al., and in accordance with PRISMA-ScR guidelines, we will perform a comprehensive search across eight electronic databases—PubMed, Embase, Scopus, CINAHL, Web of Science, ERIC, ProQuest Dissertations, and Google Scholar—for English studies published between January 1, 2015, and December 31, 2025. The review will include empirical studies, case reports, program descriptions, and grey literature that detail governance structures, leadership models, or decision-making processes within academic health systems engaged in educational programs or clinical training. These must operate across two or more geographically separated sites (>50 km apart) or within coordinated networks with shared governance. Two reviewers will independently screen titles, abstracts, and full texts using piloted inclusion criteria, facilitated by Covidence software. Data extraction will focus on organizational models, governance mechanisms, leadership structures, decision-making processes, stakeholder engagement, and outcomes reported. Quantitative data will be analyzed using descriptive statistics, while qualitative data will undergo Braun & Clarke's reflexive thematic analysis. An advisory panel of academic health system leaders will review and validate findings, providing insights into practical applications. Based on preliminary searches, we estimate identifying 80–150 relevant studies.



Guidelines

Methodological Guidelines

- PRISMA Extension for Scoping Reviews (PRISMA-ScR) Checklist (Tricco et al., 2018)
- Arksey and O'Malley Scoping Review Framework (2005) with Levac et al. refinements (2010)
- JBI Manual for Evidence Synthesis - Chapter 11: Scoping Reviews (Peters et al., 2020)
- PRESS (Peer Review of Electronic Search Strategies) 2015 Guideline Statement (McGowan et al., 2016)

Data Security

All study data will be stored on password-protected, encrypted institutional servers with regular automated backups. Access will be limited to research team members.

Data Retention

Data will be retained for 7 years following publication per institutional research data management policy.

Data Sharing

De-identified data (list of included studies, data extraction forms) will be made available upon reasonable request to the corresponding author, subject to any intellectual property restrictions. Complete search strategies and supplementary materials will be published with the manuscript.

Materials

Software and Tools:

- Reference Management: EndNote 20 (Clarivate Analytics)
- Screening and Data Management: Covidence (www.covidence.org)
- Qualitative Analysis: NVivo 14 (QSR International)
- Statistical Analysis: Microsoft Excel 2021, Stata 17.0 (StataCorp)
- Visualization: Microsoft PowerPoint, Canva (for infographics)
- Collaboration: Microsoft Teams, Google Docs for team coordination

Database Access:

Institutional subscriptions through MBRU Library:

- PubMed/MEDLINE (free access)
- Embase via Ovid
- Scopus
- CINAHL Complete via EBSCOhost
- Web of Science
- ERIC via ProQuest
- ProQuest Dissertations & Theses Global

Human Resources:

- Research team: 8 co-authors contributing 10-15 hours per month each
- Research librarian: Consultation on search strategy (5 hours)
- Statistical consultant: Data analysis support (10 hours)
- Advisory panel: 10-12 stakeholders (3-5 hours per member)

Safety warnings

- ! This protocol is registered on protocols.io before starting the review. Any changes to the protocol will be recorded with the date, a description of the change, and the reason for it. The version history of the protocol will be kept on protocols.io. Significant amendments that influence the search strategy, eligibility criteria, or analysis approach will lead to a new protocol version with an updated number and date.

Ethics statement

This scoping review examines published and publicly accessible literature and does not include primary data collection from human subjects. In accordance with Dubai Health and Mohammed Bin Rashid University of Medicine and Health Sciences guidelines, ethics approval is unnecessary for this type of secondary research. All sources will be properly cited, and intellectual property rights will be upheld. No patient data or personally identifiable information will be gathered.

If the optional stakeholder consultation phase occurs, all participants will give informed consent, and approval will be obtained from the relevant institutional review board before any consultation activities begin.

OBJECTIVES

1 Primary Objective

To systematically map and synthesize the existing literature on governance and leadership structures in multi-campus academic health systems, identifying organizational models, coordination mechanisms, and reported outcomes.

1.1 Secondary Objectives

1.1.1. Identify and classify types of governance structures and organizational models used to coordinate multi-campus academic health systems

1.1.2. Describe leadership roles, responsibilities, reporting relationships, and coordination mechanisms across geographically distributed sites

1.1.3. Characterize decision-making processes, including authority distribution, delegation patterns, and shared governance mechanisms

1.1.4. Examine stakeholder engagement strategies, representation structures, and participatory governance approaches across distributed campuses

1.1.5. Synthesize reported outcomes, performance indicators, challenges, facilitators, and success factors associated with different governance models

1.1.6. Identify implementation considerations, contextual factors, and organizational change strategies for establishing or modifying governance structures

1.1.7. Map knowledge gaps, methodological limitations, and priority areas for future research in multi-campus academic health system governance

METHODOLOGY OVERVIEW

2 This scoping review follows the six-stage methodological framework established by Arksey and O'Malley (2005):

(i) Identifying the research question

(ii) Identifying relevant studies

(iii) Study selection

(iv) Charting the data

(v) Collating, summarizing, and reporting results

(vi) Consultation with stakeholders.

We incorporate methodological enhancements recommended by Levac et al. (2010), including iterative team refinement of the research question and stakeholder consultation as an integral component.

3 The review adheres to the PRISMA Extension for Scoping Reviews (PRISMA-ScR) reporting guidelines. A completed PRISMA-ScR checklist will be included as

supplementary material with the final manuscript.

- 4 Protocol registration on protocols.io was completed before commencing systematic searches.

STAGE 1: IDENTIFY THE RESEARCH QUESTIONS

- 5 Primary Research Question

What governance and leadership structures are described in the literature for coordinating multi-campus academic health systems?

- 6 Secondary Research Questions

- What organizational models and governance frameworks (centralized, decentralized, federated, matrix, hybrid) are used to coordinate educational programs and clinical training across multiple campuses or sites?
- How are leadership roles, responsibilities, reporting relationships, and accountability structures defined and implemented across distributed academic health system sites?
- What decision-making processes, authority distribution mechanisms, and shared governance structures exist in multi-campus academic health systems, and how do they function across organizational levels (strategic, operational, academic)?
- How do multi-campus academic health systems engage diverse stakeholders (faculty, students, clinical partners, community representatives) in governance processes, and what mechanisms ensure representation across distributed sites?
- What outcomes (educational quality, faculty satisfaction, financial sustainability, accreditation compliance, student performance, workforce distribution) are reported in association with different governance models, and what challenges, facilitators, and success factors are identified?
- What are the current knowledge gaps, methodological limitations, and future research priorities regarding governance in multi-campus academic health systems?

STAGE 2: IDENTIFY RELEVANT STUDIES

- 7 Information Sources

Electronic Databases:

- PubMed/MEDLINE (National Library of Medicine)
- Embase (Elsevier)
- Scopus (Elsevier)
- CINAHL Complete (Cumulative Index to Nursing and Allied Health Literature)
- Web of Science Core Collection (Clarivate)
- ERIC (Education Resources Information Center - U.S. Department of Education)

- ProQuest Dissertations & Theses Global
- Google Scholar (first 300 results based on relevance ranking)

Grey Literature Sources:

- Association of American Medical Colleges (AAMC) reports and publications
- Association for Medical Education in Europe (AMEE) guides and resources
- Liaison Committee on Medical Education (LCME) institutional reports
- World Federation for Medical Education (WFME) documents
- Organizational websites of leading academic health systems
- Conference proceedings (AMEE, AAMC Learn Serve Lead, APHA Annual Meeting)

Supplementary Searching:

- Reference lists of included studies and relevant systematic reviews
- Citation tracking of key papers using Scopus and Web of Science
- Expert consultation to identify additional sources

8 Search Strategy Development

The search strategy was developed iteratively through:

- Analysis of key papers identified in preliminary scoping
- Extraction of relevant keywords and indexing terms from key papers
- Consultation with a health sciences research librarian
- Pilot testing and refinement based on sensitivity checks

Search terms are organized into three main concept blocks, combined using Boolean operators:

8.1 Concept 1: Academic Health Systems

- Keywords: academic health center*, academic health system*, academic medical center*, teaching hospital*, university hospital*, health sciences center*, health sciences university, medical school*, academic health network*, academic health science*
- Controlled vocabulary: "Academic Medical Centers"[Mesh], "Hospitals, Teaching"[Mesh], "Hospitals, University"[Mesh], "Schools, Medical"[Mesh]

8.2 Concept 2: Multi-Campus/Distributed Characteristics

- Keywords: multi-campus*, multicampus*, multi-site*, multisite*, distributed, regional campus*, satellite campus*, branch campus*, multiple campus*, multiple site*, geographically dispersed, geographic* distributed, network*, system*, federated, consortium, affiliated site*, clinical training site*, coordinated network*

- Controlled vocabulary: "Interinstitutional Relations"[Mesh], "Cooperative Behavior"[Mesh]

8.3 Concept 3: Governance/Leadership/Organization

- Keywords: governance*, leadership*, organizational structure*, organizational model*, organizational design*, organizational architecture*, administration*, management*, organizational management*, decision making, decision-making, coordination*, coordinat*, authority, accountability, shared governance, collaborative governance, organizational framework*, administrative structure*, board*, council*, committee*, organizational innovat*, organizational change*, system integration*
- Controlled vocabulary: "Organizational Innovation"[Mesh], "Leadership"[Mesh], "Hospital Administration"[Mesh], "Organizational Policy"[Mesh], "Models, Organizational"[Mesh], "Organizational Culture"[Mesh], "Interinstitutional Relations"[Mesh]

8.4 Concept 4: Education Context (Optional - used for sensitivity)

- Keywords: medical education, health professions education, healthcare education, clinical education, nursing education, graduate medical education, undergraduate medical education, residency training, clinical training, educational program*
- Controlled vocabulary: "Education, Medical"[Mesh], "Education, Nursing"[Mesh], "Education, Pharmacy"[Mesh], "Education, Dental"[Mesh], "Students, Health Occupations"[Mesh]

9 Sample PubMed Search Strategy

#1 Academic Health Systems

("academic health center"[tiab] OR "academic health centers"[tiab] OR "academic health system"[tiab] OR "academic health systems"[tiab] OR "academic medical center"[tiab] OR "academic medical centers"[tiab] OR "teaching hospital"[tiab] OR "teaching hospitals"[tiab] OR "university hospital"[tiab] OR "university hospitals"[tiab] OR "health sciences center"[tiab] OR "health sciences centers"[tiab] OR "health sciences university"[tiab] OR "medical school"[tiab] OR "medical schools"[tiab] OR "academic health network"[tiab] OR "Academic Medical Centers"[Mesh] OR "Hospitals, Teaching"[Mesh] OR "Hospitals, University"[Mesh] OR "Schools, Medical"[Mesh])

#2 Multi-Campus/Distributed

("multi-campus"[tiab] OR "multicampus"[tiab] OR "multi-site"[tiab] OR "multisite"[tiab] OR "distributed"[tiab] OR "regional campus"[tiab] OR "regional campuses"[tiab] OR "satellite campus"[tiab] OR "satellite campuses"[tiab] OR "branch campus"[tiab] OR "branch campuses"[tiab] OR "multiple campus"[tiab] OR "multiple campuses"[tiab] OR

"multiple site"[tiab] OR "multiple sites"[tiab] OR "geographically dispersed"[tiab] OR "geographically distributed"[tiab] OR "network"[tiab] OR "networks"[tiab] OR "federated"[tiab] OR "consortium"[tiab] OR "consortia"[tiab] OR "affiliated site"[tiab] OR "affiliated sites"[tiab] OR "clinical training site"[tiab] OR "clinical training sites"[tiab] OR "coordinated network"[tiab] OR "Interinstitutional Relations"[Mesh] OR "Cooperative Behavior"[Mesh])

#3 Governance/Leadership

(governance*[tiab] OR leadership*[tiab] OR "organizational structure"[tiab] OR "organizational structures"[tiab] OR "organizational model"[tiab] OR "organizational models"[tiab] OR "organizational design"[tiab] OR "organizational architecture"[tiab] OR administration*[tiab] OR management*[tiab] OR "organizational management"[tiab] OR "decision making"[tiab] OR "decision-making"[tiab] OR coordination*[tiab] OR coordinat*[tiab] OR authority[tiab] OR accountability[tiab] OR "shared governance"[tiab] OR "collaborative governance"[tiab] OR "organizational framework"[tiab] OR "organizational frameworks"[tiab] OR "administrative structure"[tiab] OR "administrative structures"[tiab] OR board*[tiab] OR council*[tiab] OR committee*[tiab] OR "organizational innovation"[tiab] OR "organizational change"[tiab] OR "system integration"[tiab] OR "Organizational Innovation"[Mesh] OR "Leadership"[Mesh] OR "Hospital Administration"[Mesh] OR "Organizational Policy"[Mesh] OR "Models, Organizational"[Mesh] OR "Organizational Culture"[Mesh])

#4 Combined Search

#1 AND #2 AND #3

#5 Date and Language Limits

#4 AND ("2015/01/01"[Date - Publication] : "2025/12/31"[Date - Publication]) AND English[lang]

FINAL SEARCH: #5

- 10 The PubMed search strategy will be adapted for other databases using appropriate syntax, controlled vocabulary (Emtree for Embase, subject headings for CINAHL), and database-specific search functions. All adaptations will be documented and included as supplementary material.
- 11 Reference lists of all included studies will be manually screened for additional relevant studies not captured in database searches.
- 12 Forward citation tracking of highly relevant studies will be conducted using Scopus and Web of Science to identify newer studies citing key papers.
- 13 Grey literature will be searched through:

- Targeted website searches of AAMC, AMEE, LCME, WFME
- Google Scholar advanced search limited to the first 300 results
- Hand-searching conference proceedings from major medical education conferences (2020-2025)
- Expert consultation with advisory panel members to identify unpublished reports or institutional documents

14 Search Validation

Sensitivity Check:

Before finalizing the search strategy, we will identify 10-15 "gold standard" papers known to be highly relevant based on preliminary scoping. These papers represent diverse governance models, geographic settings, and study designs. The search strategy will be tested to ensure it captures $\geq 90\%$ of these known relevant papers. If the capture rate is $< 90\%$, the search strategy will be refined by adding additional terms or adjusting combinations until adequate sensitivity is achieved. This validation process will be documented.

Gold Standard Paper Examples (to be finalized):

- Papers describing well-known multi-campus systems (University of Washington WWAMI, University of Minnesota DULUTH program, University of California system)
- Key governance framework papers (Mintzberg's organizational configurations adapted to health systems)
- Recent reviews of distributed medical education

15 Documentation

All database searches will be documented with:

- Database name and platform
- Date of search
- Search strategy with line-by-line results
- Total results retrieved
- Results after deduplication
- Any limits or filters applied

This documentation will be included as supplementary material to ensure reproducibility.

STAGE 3: STUDY SELECTION

16 Population

Academic institutions offering health professions education (medicine, nursing, dentistry, pharmacy, public health, allied health) that operate educational programs or clinical

training through:

Option A: Two or more geographically distinct campus locations separated by >50 kilometers, where each campus has dedicated educational facilities and faculty, OR

Option B: A main campus coordinating with three or more affiliated clinical training sites, where students complete substantial portions (>3 months) of their education, OR

Option C: A formally coordinated network of two or more institutions with explicit shared governance arrangements for educational programs

Operational Definitions:

- "Academic health system": Institution with a medical school, teaching hospital, or health professions education program
- "Campus": Physical location with dedicated educational space, administrative presence, and regular faculty
- "Clinical training site": Healthcare facility where students complete supervised clinical experiences
- "Coordinated network": Multiple institutions with documented governance agreements, shared decision-making, or formal affiliation

17 Concept

Studies must describe, analyze, or evaluate at least ONE of the following:

Governance Structures:

- Organizational charts, reporting relationships, and administrative hierarchies
- Board or council composition, authority, and decision-making purview
- Coordination mechanisms across sites (committees, task forces, councils)
- Governance frameworks or models (centralized, decentralized, federated, matrix, hybrid)

Leadership:

- Leadership positions, roles, and responsibilities across distributed sites
- Leadership selection, appointment, or succession processes
- Leadership coordination, communication, or collaboration mechanisms
- Distributed leadership models or site-specific administrative structures

Decision-Making:

- Decision-making processes, authority distribution, and delegation patterns
- Types of decisions (strategic, operational, academic, financial, personnel)
- Stakeholder involvement, shared governance, participatory processes
- Conflict resolution, consensus-building, or dispute mechanisms

Minimum Reporting Requirement: The Study must provide sufficient detail about governance/leadership structures to extract meaningful information. Brief mentions without substantive description will be excluded.

18 Context

- Any geographic setting (urban, rural, regional, national, international)
- Any country or health system context
- Any institutional size, type, or ownership (public, private, non-profit)
- Any health professions education level (undergraduate, graduate, postgraduate, continuing education)
- Any stage of implementation (planning, early implementation, established programs)

19 Study Designs Included

All empirical research designs and descriptive reports:

- Quantitative: surveys, comparative studies, quasi-experimental, cohort studies
- Qualitative: interviews, focus groups, ethnography, case studies
- Mixed methods: any combination of qualitative and quantitative approaches
- Descriptive: program descriptions, organizational case reports, institutional analyses
- Grey literature: institutional reports, white papers, policy documents, conference proceedings with sufficient methodological detail

20 Publication Types Excluded

- Letters to the editor, editorials, commentaries <500 words without substantive data or organizational description
- Conference abstracts without full text available (abstracts will be screened for potential full papers to obtain)
- Book chapters without peer review or editorial oversight (unless from a major academic publisher and containing a substantive organizational description)
- Protocols or study plans without results or an implementation description
- Non-English language publications (due to resource constraints and validated translation costs)

21 Date Range

January 1, 2015, to December 31, 2025

Rationale: 2015 marks a period of accelerated multi-campus expansion in medical education globally, including LCME standards revision addressing distributed campuses. This 10-year window captures contemporary governance approaches while remaining manageable in scope.

22 Additional Exclusion Criteria

- Studies focused exclusively on single-site institutions without multi-campus or distributed components.
- Studies addressing only clinical care delivery, research administration, or corporate governance, without educational governance
- Studies of telemedicine, telehealth, or virtual care delivery without educational governance focus
- Studies of online education programs without physical campus or clinical training site components
- Duplicate publications (the most complete or recent version will be included)

23 Eligibility Criteria Decision Tree

To enhance consistency in screening, reviewers will apply this decision tree:

TITLE/ABSTRACT SCREENING DECISION TREE:

Q1: Is this about health professions education?

NO → EXCLUDE (not relevant population)

YES → Continue to Q2

Q2: Does it involve multiple geographically distinct sites, campuses, or a coordinated network?

NO → EXCLUDE (single-site only)

UNCLEAR → INCLUDE for full-text review

YES → Continue to Q3

Q3: Does it describe, analyze, or evaluate governance, leadership, or organizational structure/decision-making?

NO → EXCLUDE (different concept focus)

UNCLEAR → INCLUDE for full-text review

YES → INCLUDE for full-text review

FULL-TEXT SCREENING DECISION TREE:

Q1: Confirms health professions education context?

NO → EXCLUDE with reason.

YES → Continue

Q2: Confirms ≥2 distinct sites OR coordinated network?

NO → EXCLUDE with reason.

YES → Continue

Q3: Provides substantive description (≥1 paragraph) of governance/leadership/decision-making structures?

NO → EXCLUDE (insufficient detail)

YES → INCLUDE

Q4: Published 2015-2025, English, not excluded publication type?

NO → EXCLUDE with reason.
YES → INCLUDE (final inclusion)

24 Citation Management

All citations from database searches will be imported into EndNote reference management software. Duplicates will be removed using EndNote's automated deduplication function, followed by manual verification of duplicate removal accuracy by checking a random sample of 100 citations.

25 Screening Software

Following deduplication, all unique citations will be imported into Covidence systematic review software (www.covidence.org) for screening and data extraction.

26 Pilot Screening

Before full screening begins:

- Two reviewers will independently screen the same random sample of 50 titles/abstracts using the eligibility criteria and decision tree
- Agreement will be calculated (percent agreement and Cohen's kappa statistic)
- If agreement is <80% or kappa <0.60, reviewers will meet to discuss discrepancies, clarify the interpretation of the criteria, and refine the decision tree
- Pilot screening will be repeated with a new sample of 50 until adequate agreement is achieved.
- Final agreement statistics will be reported.

27 Title/Abstract Screening

Two reviewers will independently screen all titles and abstracts using the eligibility criteria. Citations will be classified as:

- Include (clearly meets criteria)
- Exclude (clearly does not meet criteria with reason)
- Uncertain (insufficient information to decide - include for full-text review)

28 Conflict Resolution

Disagreements between reviewers at the title/abstract stage will be resolved through:

- Discussion between the two reviewers to reach a consensus
- If consensus cannot be reached, a third reviewer will make the final decision
- All conflicts and resolutions will be documented in Covidence

29 Full-Text Retrieval

Full texts of all studies marked "include" or "uncertain" at title/abstract screening will be retrieved through:

- Institutional library electronic access
- Interlibrary loan requests
- Direct requests to authors via email or ResearchGate
- Open access repositories

Studies for which full text cannot be obtained after reasonable efforts (3 attempts over 3 weeks) will be documented as "unobtainable" with reasons.

30 Full-Text Screening

Two reviewers will independently assess full-text articles against eligibility criteria using the full-text decision tree. Detailed reasons for exclusion will be documented using standardized categories:

- Wrong population (not health professions education)
- Wrong concept (no governance/leadership focus)
- Wrong context (not multi-site/distributed)
- Insufficient detail (lacks substantive description)
- Wrong study design (excluded publication type)
- Wrong date range
- Wrong language
- Duplicate publication
- Full text unobtainable

31 Inter-Rater Reliability

Cohen's kappa will be calculated for both title/abstract screening and full-text screening to assess inter-rater reliability. Kappa values will be interpreted as: <0.40 poor, 0.40-0.60 moderate, 0.60-0.80 substantial, >0.80 excellent agreement.

32 PRISMA Flow Diagram

The study selection process will be documented using a PRISMA-ScR flow diagram showing:

- Records identified from each database
- Records after deduplication
- Records screened at title/abstract
- Records excluded at title/abstract with reasons
- Full texts assessed for eligibility
- Full texts excluded with reasons (categorized)
- Studies included in the final synthesis
- Additional studies identified through other methods

STAGE 4: DATA CHARTING

33 Data Extraction Form Development

The data extraction form will be developed through an iterative, consensus-based process:

Phase 1: Initial Form Development

- Research team reviews included studies from pilot screening
- Identifies key variables relevant to research questions
- Develops a draft data extraction form in Microsoft Excel

Phase 2: Pilot Testing

Two reviewers independently extract data from the same five diverse studies representing:

- Different governance models (centralized, decentralized, federated)
- Different study designs (qualitative, quantitative, mixed methods)
- Different geographic settings (North America, Europe, Asia, other)
- Different institutional sizes (small, medium, large systems)
- Different health professions (medicine, nursing, multiple professions)

Phase 3: Reliability Assessment

- Calculate percent agreement for categorical variables
- Calculate the intraclass correlation coefficient (ICC) for continuous variables
- Identify variables with low agreement (<70%)
- Analyze sources of disagreement

Phase 4: Form Refinement

- Team discusses discrepancies and ambiguous cases
- Refines variable definitions and decision rules
- Creates a data extraction manual with examples and clarifications
- Updates the data extraction form

Phase 5: Re-Pilot Testing

- The same two reviewers re-extract data from the same five studies using a refined form
- Calculate agreement statistics
- If agreement >80% for categorical variables and ICC >0.70 for continuous variables
→ proceed to complete extraction.
- If agreement remains <80%, conduct additional refinement and re-testing

Phase 6: Documentation

- Finalize data extraction form
- Document all refinements and decision rules
- Create a detailed data extraction manual
- Include as supplementary material with the manuscript

34 Data to be Extracted

34.1 Study Identification and Characteristics

- Study ID: First author surname-Year (e.g., Smith-2020)
- Citation: Full bibliographic reference
- Country/Region: Location of institution(s)
- Publication Year: Year published
- Publication Type: Peer-reviewed journal article, Grey literature report, Conference proceeding, Dissertation/thesis, Book chapter, Other (specify)
- Study Design: Descriptive (case report, program description, institutional report), Qualitative (interviews, focus groups, ethnography, document analysis), Quantitative (survey, comparative, quasi-experimental, cohort), Mixed methods (qual + quant), Systematic review, Other (specify)
- Study Aim/Objective: Brief statement of primary aim (verbatim quote if <25 words)
- Study Duration/Timeframe: Time period covered by the study (if applicable)
- Data Collection Methods: How data were obtained (surveys, interviews, document review, etc.)
- Data Source: Primary empirical data, secondary analysis, expert opinion, or mixed

34.2 Institutional Characteristics

- Institution Name: Name(s) of academic health system(s) (if identifiable)
- Institutional Type: Public academic health center, Private academic health center, University hospital system, Health Sciences University, Community-academic partnership, Other (specify)
- System Size - Number of Campuses/Sites: 2 sites, 3-5 sites, 6-10 sites, > 10 sites, Not reported
- System Size - Geographic Span: Local/Regional (within one state/province), Multi-state/Multi-province, National, International, Not reported
- Geographic Distribution: Urban, rural, mixed, or not reported
- Student Enrollment: Total number of students (if reported)
- Programs Offered: Types of health professions programs: Medicine (MD/MBBS), Nursing (BSN, MSN, DNP), Dentistry, Pharmacy, Allied health, Public health, Graduate medical education (residency/fellowship), Multiple programs, Other (specify)
- System Age/Maturity: Planning stage (<1 year operational), Early implementation (1-3 years), Established (3-10 years), Mature (>10 years), Not reported

34.3 Governance Structure

Governance Model Classification:

- Centralized: A Single administrative center makes all major decisions with minimal site autonomy
- Decentralized: Each site has substantial autonomous decision-making authority
- Federated: Coordinated model with shared system-level authority and site-specific authority for local matters
- Matrix: Dual reporting lines (both functional and geographic)
- Hybrid: A Combination of multiple models
- Unclear/Not specified
- Other (describe)

Decision Rule:

If the governance model is not explicitly named, classify based on the described authority distribution and decision-making patterns. If characteristics of multiple models are present, code as "Hybrid" and note which models. If insufficient information, code as "Unclear."

- Organizational Chart Provided: Yes (include in supplementary materials) / No / Partial
- Governance Bodies Described: System-wide board/governing board, Executive leadership team/cabinet, Academic council/senate, Site-specific councils, Standing committees, Ad hoc committees/task forces, Community advisory boards, Student representation bodies, Other (specify)
- Board/Council Composition: Description of who serves on key governance bodies (roles, representation)
- Authority Distribution: Description of what decisions are made at what levels (system, regional, site, departmental)
- Coordination Mechanisms: How sites/campuses coordinate (regular meetings, shared platforms, liaison roles, etc.)

34.4 Leadership Roles and Structure

- System-Level Leadership Positions: Titles and roles described (e.g., CEO, Dean, Vice President, Chief Academic Officer)
- Site-Level Leadership Positions: Titles and roles at individual campuses/sites
- Leadership Reporting Relationships: Description of who reports to whom
- Leadership Qualifications: Required credentials, experience, or qualifications (if described)
- Leadership Selection Process: How leaders are appointed, selected, or elected (if described)
- Leadership Span of Control: Number of direct reports, sites overseen (if reported)

- Faculty Leadership Roles: Department chairs, program directors, site directors, course coordinators
- Support/Administrative Roles: Non-faculty administrative positions supporting governance

34.5 Decision-Making Processes

- Types of Decisions Addressed: Strategic planning, Budget/financial allocation, Academic affairs (curriculum, admissions, assessment), Faculty appointments and promotion, Quality assurance and accreditation, Research priorities, Clinical partnerships, Technology/infrastructure investments, Other (specify)
- Decision-Making Authority by Level: What decisions are made at the system level? What decisions are made at the regional/cluster level? What decisions are made at the site level? What decisions are made at the department level?
- Decision-Making Processes: Description of how decisions are made (voting, consensus, consultation, executive authority)
- Stakeholder Involvement: Who participates in what types of decisions
- Communication Mechanisms: How decisions are communicated across the system
- Conflict Resolution: How disagreements or conflicts are resolved (if described)

34.6 Stakeholder Engagement

- Stakeholder Groups Engaged: Faculty (basic science, clinical, community-based), Students (by program type), Clinical partners/affiliated hospitals, Community representatives, Alumni, Staff/administrators, Patients/public, Other (specify)
- Engagement Mechanisms: Representation on boards/councils, Standing committees, Advisory groups, Town halls/forums, Surveys/feedback mechanisms, Focus groups, Other (specify)
- Shared Governance Structures: Description of shared governance arrangements
- Cross-Site Representation: How distributed sites are represented in governance
- Equity of Representation: Whether all sites have proportional or equal representation

34.7 Outcomes and Impact

- Outcome Measures Assessed/Reported: Educational quality indicators, Accreditation compliance/status, Student performance metrics, Graduate outcomes (match rates, licensure pass rates), Faculty satisfaction/retention, Institutional efficiency/cost-effectiveness, Workforce distribution (graduates practicing in the region), Research productivity, Community impact, Patient care quality, Other (specify)
- Quantitative Outcomes: Numerical results (extract specific values, sample sizes, p-values, effect sizes if reported)
- Qualitative Outcomes: Described impacts, benefits, and changes
- Challenges Identified: Barriers, obstacles, and difficulties reported: Communication across sites, Ensuring quality consistency, Resource allocation equity, Faculty

recruitment/retention, Technology infrastructure, Cultural differences across sites, Accreditation compliance, Other (specify)

- Facilitators/Success Factors: Elements that supported successful governance: Strong leadership commitment, Clear role definitions, Effective communication systems, Shared vision/culture, Adequate resources, Technology infrastructure, Stakeholder engagement, Other (specify)
- Lessons Learned: Key takeaways or recommendations from authors

34.8 Implementation Considerations

- Implementation Strategy: How governance structures were established or changed
- Timeline: Duration from planning to implementation (if reported)
- Resources Required: Financial, human, and technological resources needed
- Change Management Approaches: Strategies for Organizational Change
- Barriers Encountered: Obstacles during implementation
- Contextual Factors: Environmental or organizational factors influencing implementation
- Sustainability Considerations: Long-term viability factors

34.9 Study Quality Descriptors

Note: This is a descriptive quality assessment, not an exclusionary quality appraisal

Study Design Rigor:

- High: Multi-site comparative study with robust methodology, validated instruments
- Moderate: Single-site case study with systematic data collection
- Low: Descriptive report without systematic methodology
- Unclear: Insufficient methodological information

Governance Description Quality:

- Comprehensive: Detailed description of structures, processes, and outcomes with supporting documentation/data
- Moderate: Structured description with some supporting information
- Minimal: Brief mention or overview without substantial detail
- Unclear: Vague or ambiguous description

Evidence Type:

- Primary empirical data (original data collected for this study)
- Secondary analysis (analysis of existing data)
- Expert opinion/institutional knowledge
- Mixed (multiple sources)

Theoretical Framework:

Is a governance or organizational theory/framework explicitly used to guide the study?

(Yes/No/Unclear; if yes, name framework)

34.10 Reviewer Information

- Data Extractor: Initials of person who extracted data
- Date of Extraction: Date data extraction completed
- Notes/Comments: Any additional information, clarifications, or uncertainties

35 Data Extraction Procedures

- Single Data Extraction: One reviewer will extract data from each included study
- Verification: A second reviewer will verify extraction accuracy for 20% of studies (randomly selected)
- Verification Agreement: Calculate the percent agreement for the verification sample
- Target Agreement: $\geq 90\%$ agreement on verification sample
- Discrepancy Resolution: Any discrepancies identified during verification will be resolved through discussion between the two reviewers, with final arbitration by a third reviewer if needed
- Quality Control: The Principal investigator will review all extraction forms for completeness and consistency

36 Missing Data

- Missing or unreported data will be coded as "Not reported" or "NR"
- Authors will NOT be contacted for missing data due to resource constraints and potential for response bias
- The extent of missing data will be described in the results
- Sensitivity analyses will examine whether findings differ based on the completeness of reporting

STAGE 5: COLLATE, SUMMARIZE, AND REPORT THE RESULTS

37 Data Management

All extracted data will be compiled in Microsoft Excel with:

- One row per study
- Columns for all extraction variables
- Data validation rules to ensure consistency
- Version control with dates and contributor initials
- Regular backups to secure institutional servers

38 Descriptive Quantitative Analysis

Quantitative data will be analyzed using descriptive statistics:

- Frequencies and Percentages: For categorical variables (governance model types, stakeholder groups, outcome types)
- Measures of Central Tendency: Means and medians for continuous variables (number of sites, student enrollment)
- Measures of Dispersion: Ranges, standard deviations, interquartile ranges
- Confidence Intervals: 95% CIs for proportions where sample size permits
- Cross-Tabulations: Governance models by institutional characteristics, outcomes by governance type
- Temporal Trends: Publication trends over time, evolution of governance approaches

Results will be presented in:

- Summary tables with frequencies and percentages
- Bar charts showing the distribution of governance models, stakeholder types, and outcomes
- Pie charts showing proportions of study designs, geographic distribution
- Geographic maps showing the distribution of included studies by country/region
- Timeline showing publication trends and key milestones

All quantitative analyses will be conducted using Microsoft Excel, SPSS, and/or R.

39 Qualitative Thematic Analysis

Qualitative data (text descriptions of governance structures, challenges, facilitators, lessons learned) will be analyzed using Braun & Clarke's (2006) reflexive thematic analysis approach:

Phase 1: Familiarization with the Data

- Two reviewers will independently read all extracted qualitative data
- Immersive reading to develop deep familiarity
- Initial observations and reflections documented

Phase 2: Generating Initial Codes

- Systematic coding of data extracts using NVivo 14 software
- Initial codebook developed collaboratively after coding the first 10 studies
- Codes applied systematically to all remaining studies
- Codebook refined iteratively as new concepts emerge
- Both inductive (data-driven) and deductive (theory-informed) coding approaches used

Coding Strategy:

- Descriptive codes: What governance structures/processes are described?
- Interpretive codes: How do structures function? What are mechanisms?
- Pattern codes: What patterns emerge across different models/contexts?

Phase 3: Searching for Themes

- Codes grouped into broader potential themes
- Visual mapping (mind maps, tables) to explore relationships between codes
- Iterative team discussions to refine theme boundaries
- Candidate themes developed

Phase 4: Reviewing Themes

- Themes reviewed against coded data extracts to ensure fit
- Themes reviewed against the entire dataset to ensure coherence
- Themes refined, split, combined, or discarded as appropriate
- Ensure themes are distinct, coherent, and meaningful

Phase 5: Defining and Naming Themes

- Final theme definitions developed with clear descriptions
- Themes named with concise, informative labels
- Scope and boundaries of each theme specified
- Sub-themes identified within main themes where appropriate

Phase 6: Producing the Report

Themes reported with:

- Clear definition and description
- Supporting data extracts (quotes/examples)
- Analysis of how the theme relates to the research questions
- Links to literature and theoretical frameworks

Inter-Coder Reliability:

- Two coders will independently code 20% of the data extracts
- Calculate Cohen's kappa for coded segments
- Target kappa ≥ 0.70 for acceptable agreement
- Discuss and resolve discrepancies to calibrate coding
- Document coding decisions in the audit trail

40 Integration of Quantitative and Qualitative Findings

Following convergent mixed methods synthesis approaches:

Joint Displays: Create tables integrating quantitative patterns with qualitative themes:

- Example: Governance model frequencies (quantitative) linked with the described implementation challenges by model type (qualitative)
- Example: Institutional characteristics (quantitative) linked with reported success factors (qualitative)

Narrative Weaving: Describe how quantitative patterns and qualitative insights complement and extend each other

Comparison and Confirmation: Identify areas of convergence, divergence, or complementarity between quantitative and qualitative findings

Meta-Inferences: Draw integrated conclusions that go beyond either data type alone

41 Subgroup and Sensitivity Analyses

If sufficient data permit, conduct exploratory subgroup analyses:

- Governance models by geographic region (North America, Europe, Africa, Asia, other)
- Governance models by institutional size (number of sites)
- Governance models by program type (medicine-only vs. multi-professional)
- Outcomes by governance model type
- Challenges by system maturity (early vs. established)

Sensitivity analyses:

- Include only peer-reviewed studies vs. all studies
- Include only comprehensive governance descriptions vs. all descriptions
- Compare findings from different time periods (2015-2019 vs. 2020-2025)

42 Synthesis Products

The synthesis will produce:

- Descriptive Overview: Characteristics of included studies (design, setting, focus)
- Governance Model Typology: Classification and description of identified governance models
- Thematic Analysis: Key themes related to leadership structures, decision-making, stakeholder engagement, and implementation
- Outcome Synthesis: Summary of reported outcomes, challenges, and success factors
- Evidence Gaps Map: Visual representation of where evidence exists and where gaps remain
- Conceptual Framework: Integrative framework synthesizing key findings
- Implementation Considerations: Practical recommendations for academic health system leaders

43 Reporting Standards

The final manuscript will follow PRISMA-ScR reporting guidelines, including:

- Completed PRISMA-ScR 22-item checklist
- PRISMA-ScR flow diagram documenting study selection
- Comprehensive description of all synthesis methods
- Transparent reporting of findings with supporting data

44 Supplementary Materials

The following will be provided as supplementary materials:

- Complete search strategies for all databases
- PRISMA-ScR checklist
- List of included studies with full citations
- List of excluded full-text studies with reasons
- Data extraction form (template)
- Sample completed data extraction forms (de-identified)
- Additional tables and figures not included in the main manuscript
- Detailed coding framework for qualitative analysis

STAGE 6 (OPTIONAL): STAKEHOLDER CONSULTATION

45 Rationale for Stakeholder Consultation

Consistent with Arksey and O'Malley's framework and Levac et al.'s enhancements, we will conduct stakeholder consultation to:

- Validate findings and interpretations
- Identify practical implications and implementation considerations
- Ensure relevance to end-users (academic health system leaders, policymakers)
- Identify additional grey literature or unpublished reports
- Inform knowledge translation and dissemination strategies

46 Stakeholder Identification and Recruitment

We will establish a 10-12-member Advisory Panel representing diverse perspectives:

Target Stakeholder Groups:

- Academic health system CEOs or senior executives (n=2-3)
- Deans of medicine or health sciences (n=2-3)
- Governance/organizational experts in healthcare or education (n=2)
- Accreditation body representatives (n=1)
- Community clinical site leaders (n=1-2)
- Medical student or resident representative (n=1)

Recruitment Strategy:

- Identify potential members through professional networks, author contacts, and organizational leadership.
- Send personalized invitations describing the project, time commitment, and value of participation.
- Aim for geographic diversity and representation of different governance models

47 Consultation Activities

Activity 1: Initial Orientation

- Distribute project overview, research questions, and preliminary findings from searches.
- Solicit input on the interpretation of eligibility criteria and data extraction priorities.
- Identify additional grey literature sources or institutional reports.

Activity 2: Interim Findings Review

- Share preliminary synthesis findings (governance models identified, emerging themes)
- Facilitate a 90-minute virtual workshop to discuss findings
- Discussion questions: Do these findings resonate with your experience? Are there governance models or considerations we're missing? What are the most important implications for practice? What barriers exist to implementing evidence-based governance?

Activity 3: Final Validation and Implications

- Share draft manuscript sections (results and discussion)
- Collect written feedback on: Accuracy and completeness of synthesis, Practical implications and recommendations, Knowledge translation priorities
- Conduct a 60-minute virtual meeting to discuss recommendations and dissemination

48 Stakeholder Engagement Documentation

All stakeholder consultation activities will be documented:

- Participant demographics and affiliations (de-identified in publication)
- Consultation methods (surveys, workshops, interviews)
- Summary of input received
- How stakeholder input influenced interpretation or recommendations
- Description of consultation process in the methods section of the manuscript

49 Ethical Considerations for Consultation

If stakeholder consultation is conducted:

- Informed consent will be obtained from all participants
- Participation will be voluntary with the option to withdraw
- Confidentiality will be maintained (comments not attributed to individuals)
- Ethical approval will be obtained from the MBRU Institutional Review Board before consultation activities.
- Participants will be acknowledged in the manuscript (with permission) or de-identified

DISSEMINATION

50 Peer-Reviewed Publication

The completed scoping review will be submitted to a high-impact, peer-reviewed journal specializing in medical education, health systems, or organizational research. Target journals (in order of preference):

- Academic Medicine (Impact Factor: 7.4)
- Medical Education (Impact Factor: 5.6)
- BMC Medical Education (Open Access, Impact Factor: 3.6)
- Learning Health Systems (Emerging journal focused on health system innovation)
- Advances in Health Sciences Education (Impact Factor: 4.1)

51 Conference Presentations

Key findings will be presented at major international conferences:

- Association for Medical Education in Europe (AMEE) Annual Conference (August 2026)
- Association of American Medical Colleges (AAMC) Learn Serve Lead Annual Meeting (November 2026)
- Society for Education in Anesthesia (SEA) / Society for Education in Surgery (SES) - relevant specialty education conferences
- International Conference on Residency Education (ICRE) - if GME governance findings are significant

52 Institutional Dissemination

Results will be shared with Dubai Health and MBRU stakeholders through:

- Executive brief (2-page summary) for leadership
- Presentation to Dubai Health governance committees
- Integration into Flex Campus Network strategic planning
- Internal seminar for faculty and administrators

53 Broader Knowledge Translation

To maximize impact, we will create:

- Infographic summarizing key findings for social media and website
- Policy brief for accreditation bodies and medical education organizations
- Webinar for academic health system administrators (in partnership with AAMC or AMEE)
- Blog post or article for medical education publications (e.g., AAMC Reporter, MedEdPublish)
- Toolkit or implementation guide for academic health systems (if findings support)

54 Open Science Practices

To promote transparency and reproducibility:

- Protocol published on protocols.io with DOI
- Complete search strategies and PRISMA checklist in supplementary materials
- De-identified data extraction forms are available upon reasonable request
- Consider depositing the whole dataset in an institutional repository or OSF (if no proprietary concerns)

TIMELINE

- 55 Month 1:
- Finalize and register protocol on protocols.io
 - Validation of the search strategy with a librarian
 - Sensitivity check with gold standard papers
 - Establish the Covidence project
- Months 2-3:
- Conduct comprehensive database searches
 - Export and deduplicate citations
 - Import to Covidence
 - Pilot title/abstract screening (n=50)
- Months 4-5:
- Title/abstract screening of all citations
 - Calculate inter-rater reliability
 - Retrieve full-text articles
 - Full-text eligibility screening
- Month 6:
- Complete full-text screening
 - Finalize included studies
 - Update PRISMA flow diagram
 - Pilot data extraction (n=5)
- Months 7-8:
- Complete data extraction from all included studies
 - Data verification (20% sample)
 - Data quality checks and cleaning
 - Preliminary descriptive analysis
- Month 9:
- Thematic analysis of qualitative data
 - Integration of quantitative and qualitative findings
 - Stakeholder consultation workshop
 - Synthesis development
- Month 10:
- Manuscript drafting
 - Internal peer review by co-authors
 - Stakeholder feedback on draft
 - Manuscript revision



Month 11:

- Final manuscript preparation
- Supplementary materials compilation
- Internal approval processes
- Journal submission

Month 12:

- Respond to peer review
- Manuscript revision and resubmission
- Begin conference abstract preparation
- Knowledge translation activities

Flexibility Note: This timeline is aspirational but realistic. We have built in flexibility and will adjust if needed based on the number of studies identified, team capacity, and peer review timelines.

Acknowledgements

We thank the CORE/loL team for consultation on search strategy development and PRESS peer review. We acknowledge the support of Dubai Health leadership in providing time and resources for this research initiative. We are grateful to our Advisory Panel members (to be named upon recruitment) for their valuable insights and expertise.