Supplementary Table 1: Classified evidence matrix.

Twenty-four sources are presented in 23 rows; Robinson/Nexhip share an overlapping corpus. Core HIM/HIA studies are distinguished from adjacent education, training, and workforce evidence in the main article. Findings are descriptive unless otherwise indicated.

Reference	Design / population	Principal evidence	Principal limitation
Lewis M[16]	Questionnaire, Australia	Formal student feedback on HIM placements	Historical; no comparator
Prins H et al.[6]	Course evaluation, the Netherlands	Internship integrated theory/project and distributed student effort	Descriptive; no comparator
Haux R et al.[5]	32 practicums, Germany/Austria	Preparation, academic–service cooperation and technical settings mattered	No student outcome assessed
Bah S, Alanzi T[17]	120 internship reports, Saudi Arabia	Placement exposure varied with EHR environment and intern roles	Supervision not measured
Cox SM[26]	USA national programme survey	Internships/practicums common; readiness difficulties reported	Programme-level only
Branda D[20]	Qualitative; six USA preceptors	Limited leadership support, preparation and preceptor training	Small, pandemic-era sample
Alhur AA[21]	HI student survey, Saudi Arabia	Reported learning/interpersonal benefits; coordinator-access difficulties	Self-report; single programme
Alzghaibi H[22]	241 students; 53 faculty, Saudi Arabia	Student/faculty perceptions of internships and roles differed	Perceptions only
Andries C[30]	32 interviews, France	Health-data-science interns reported data-management preparation gaps	One programme; no supervision measure
Rajamani S[28]	Programme report, USA	Academic–practice partnerships supported placement scale (692 students)	No comparative outcome
Fenton SH, Mustata Wilson G[29]	Programme evaluation, USA	Preliminary positive experience/skills for underserved participants	No comparator
Prasad N[9]	22 students; 24 supervisors, Australia	Remote placement relied on schedules, technology and communication	One programme; pandemic
Robinson K et al.;[4] Nexhip A et al.[7]	Overlapping proposal audit, Australia	Project-based HIM placements; 38/129 proposals lacked explicit outcomes	One university; overlap; not observed supervision
Mensah NK et al.[8]	Mixed methods; 10 Ghanaian hospitals	Guidance/teamwork benefits; inadequate supervision and logbooks	Cross-sectional; no comparator
Safdari R, Ehtesham H[12]	Delphi, 20 HIT faculty, Iran	Five categories of internship-monitoring data elements	Proposed system not tested
Alzghaibi H et al.[3]	127 HI experts, Saudi Arabia	Structured internship endorsed; 6 months identified as optimal	Expert opinion only
Hayavi-Haghighi MH[35]	Two separate HIT assessment cohorts, Iran	OSPE mean 16.77→17.88; project 17.60→18.16; MCQ 15.25→14.00	Not paired; no control / support intervention
Emekli E[36]	Non-randomised medical-student study, Türkiye	Record scores: trained 38.13→88.33; comparison post 62.27	Different years; no comparison baseline; no formal inter-rater

			reliability
Ke MY[27]	Four PHI internship cohorts, USA	149 students; satisfaction stable; negative concerns decreased	Single programme; no comparator
Hajiabadi E[33]	Single-group HIT simulation, Iran	SEPAS 16.33→18.80 (p=0.003); time 7.87→5.27 min (p=0.032)	Pre-placement preparation; no control; other task results mixed
Hamada D[34]	587 HIT graduates, USA	Internship participation linked to reported employment outcomes	Retrospective; confounding
Simba R[37]	27 practicum students, Tanzania	Knowledge 45.0→75.6; attitudes 3.0→4.1; practice 2.5→4.0	Non-trained group descriptive; no inferential between-group effect
Barefield AC[13]	Two HIA programmes, USA	Virtual laboratory integrated with professional practice	Uncontrolled; denominators unclear

Caution: The study populations, instruments and designs are heterogeneous and do not support pooled estimates. The comparative and pre/post reports do not isolate the effect of HIM mentoring or supervision.

HI: health information; HIA: health information administration; HIM: health information management; HIT: health information technology; OPSE: Objective Structured Practical Examination; PHI: Public Health Institute; SEPAS: Iran Electronic Health System.