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Core competencies of Evidence-Based Health Care (EBHC) educators
A development and validation study

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About this study

- Conflicts of interest: none
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Background

- EBHC is being promoted across various health care professions.
- While educators play a key role in EBHC training, a systematic framework for training these educators remains lacking.

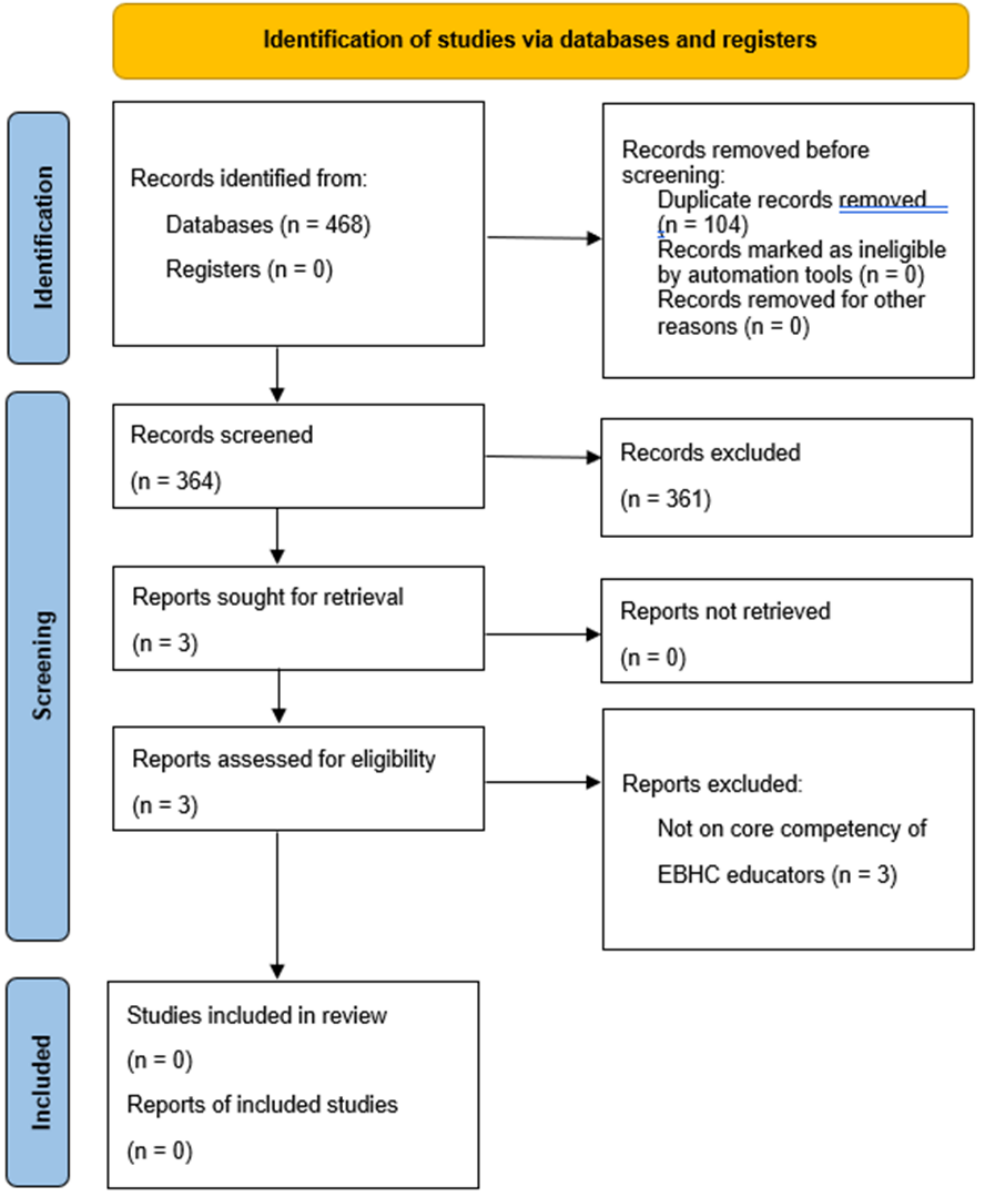
Aims

We wish to develop and validate the core competencies of EBHC educators, which would be applicable across various healthcare professions and incorporate the ability to use AI and other technology tools in teaching.

Methods (1/3)

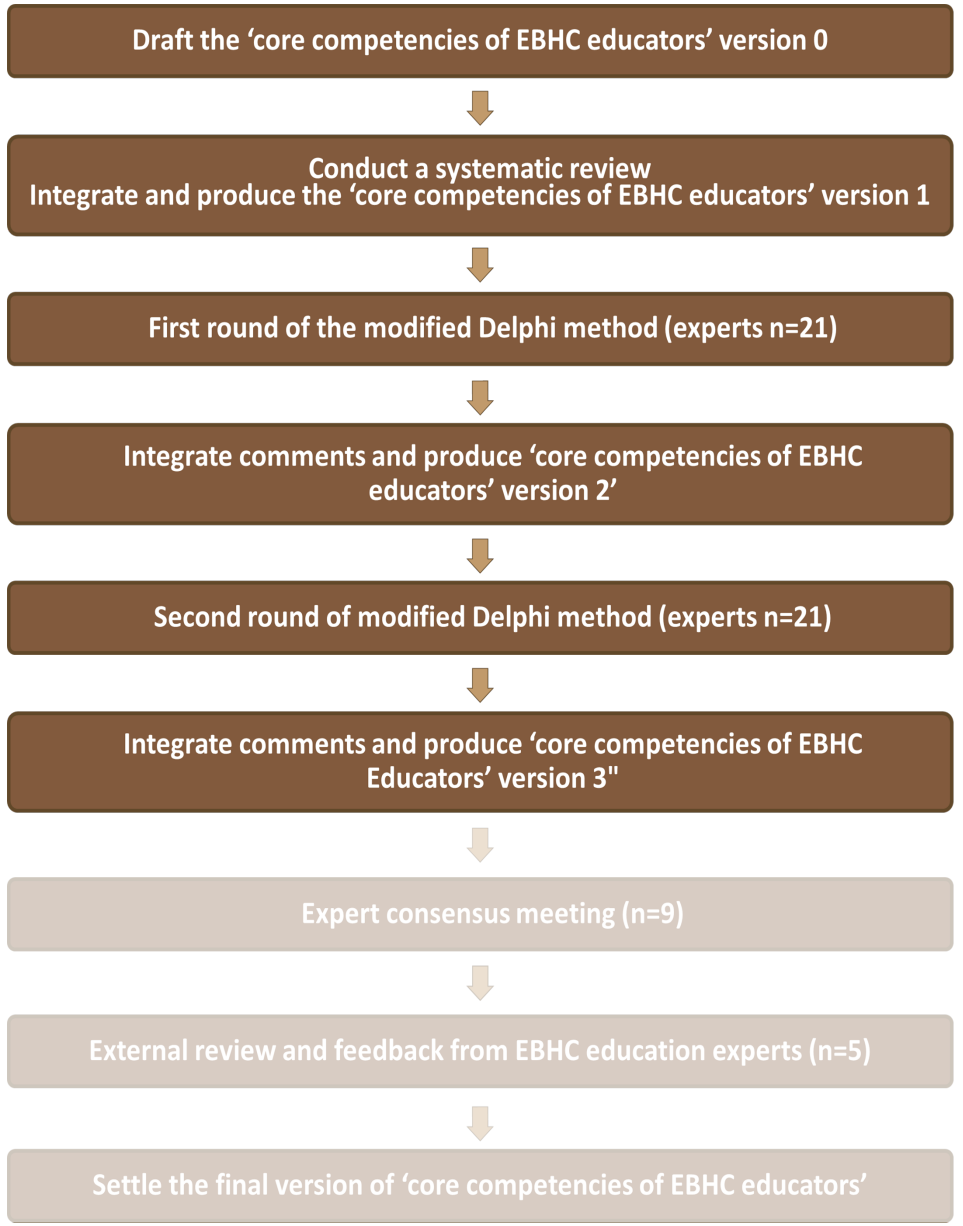
- We first drafted a set of core competencies of EBHC educators which contained 34 specific elements.

- We first performed a systematic review to check current available core competencies of EBHC educators but found none.



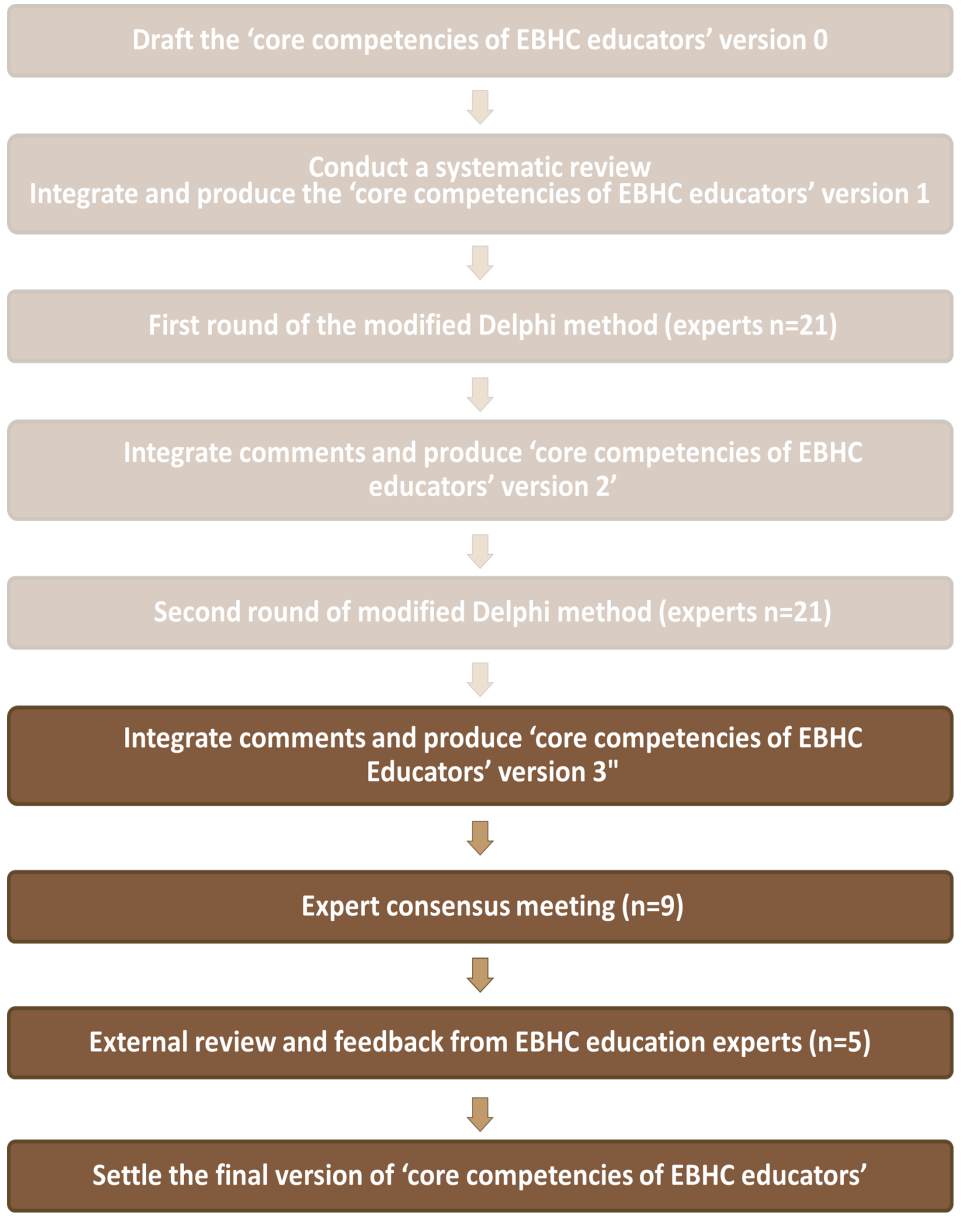
Methods (2/3)

- We then adopted the modified Delphi technique and recruited 21 EBHC education experts to comment and score each specific element on a 5-point scale.
- Inclusion criteria for EBHC education experts: Experience in conducting EBHC faculty development workshops at the Taiwan Evidence-Based Medicine Association (TEBMA) or teaching hospitals.
- All specific elements rated < 3 by any expert were removed.
- The specific elements were modified or merged considering experts' feedback.
- When all specific elements were rated ≥ 3 by all experts with an interquartile range (IQR) of ≤ 1, a consensus on the element was achieved.



Methods (3/3)

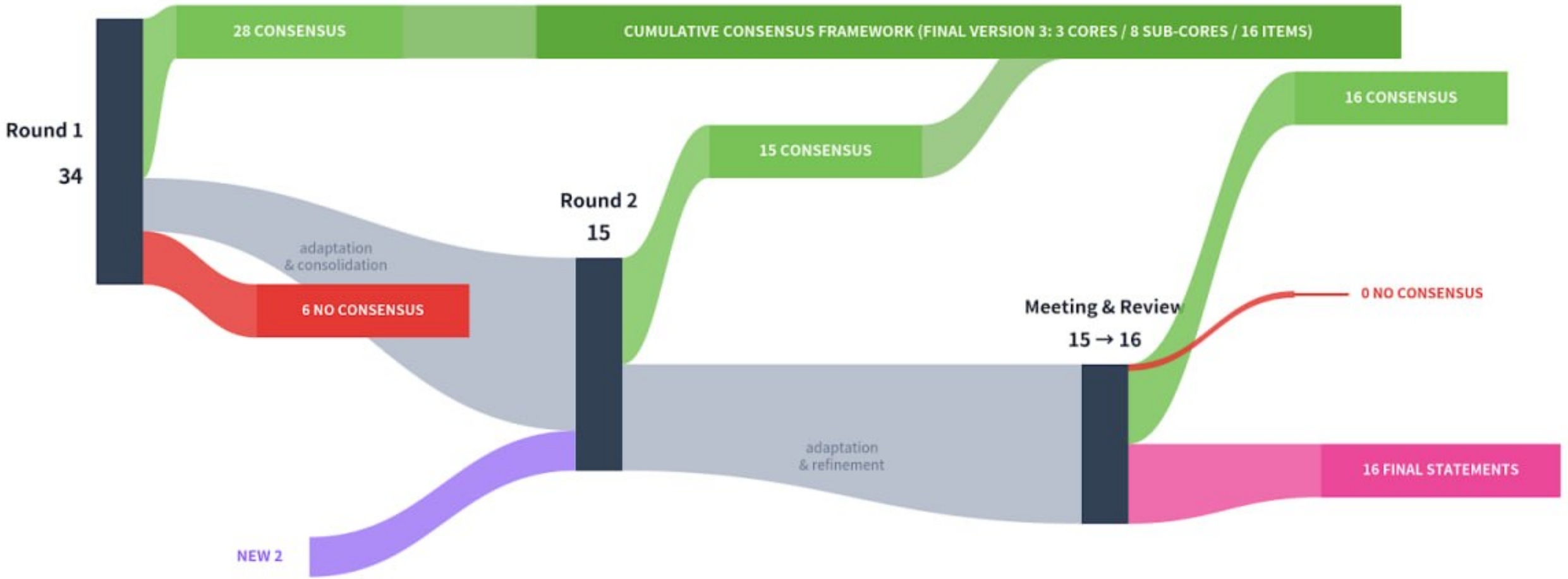
- The content validity index (CVI) was calculated.
- **Item level content validity index (I-CVI)** = Proportion of experts who give a specific item a relevance rating of 4 or 5.
- **Scale level content validity index Average (S-CVI/Ave)** = Average of the I-CVI scores for all the items.
- The content validity was considered constructed when all the I-CVIs were ≥ 0.78 and the S-CVI/Ave was ≥ 0.9.
- The contents of core competencies of EBHC educators were finalized through an expert consensus meeting



Results (1/5)

- Through a two-round modified Delphi process, an expert consensus meeting, and external review, we identified **3 core competencies**, **8 sub-competencies**, and **16 specific elements** that EBHC teachers should possess.
- The content validity was strongly supported, with all item-level CVIs (I-CVI) ≥ 0.78 and the scale-level CVI average (S-CVI/Ave) ≥ 0.9.
- These competencies encompass *EBHC instruction, assessment, constructive feedback, curriculum design, resource management, professional reflection, continuous development, and educational*

Results (2/5)



Systematic consensus progression: Initial 34 draft items condensed and refined into 16 final validated elements.

Results (3/5)

Core competencies of EBHC educators			Expert scoring results		
Core Competence	**Sub-Core Competence**	**Specific elements**	**Median**	**I-CVI**	**IQR**
I. Methods and practice of teaching	1.1 Teaching of EBHC	1.1.1 Able to select appropriate clinical scenarios and guide learners in practicing the 5A steps of EBHC	5	1	0
		1.1.2 Make good use of lecturing skills, teaching models[1], and technology tools[2] to assist teaching and enhance learning effectiveness. *[1]For example gamification, online interactive software, team-based learning.* *[2]For example RevMan Web, GRADEpro, and AI-productivity tools.*	5	1	0
	1.2 Assessment of EBHC	1.2.1 Apply appropriate assessment methods (e.g., pre- and post-test questionnaires, OSCE, mini-CEX, workplace-based assessment, etc.) to evaluate EBHC learning effectiveness	5	1	0
	1.3 Feedback in EBHC	1.3.1 Provide constructive feedback based on learners' needs and deficiencies, and guide learners in using relevant learning resources	5	1	0

Results (4/5)

Core competencies of EBHC educators			Expert scoring results		
Core Competence	**Sub-Core Competence**	**Specific elements**	**Median**	**I-CVI**	**IQR**
II. Management of teaching	2.1 Planning of EBHC teaching and curriculum design	2.1.1 Proper time management for teaching	5	1	1
		2.1.2 Design EBHC courses that meet learners' needs	5	1	1
	2.2 Utilization of EBHC teaching resources	2.2.1 Management and cultivation of EBHC faculty	4	1	1
		2.2.2 Properly utilize existing resources (manpower, time, space, software and hardware, etc.) for EBHC teaching	4	1	1
		2.2.3 Expand EBHC teaching resources	4	1	1

Results (5/5)

Core competencies of EBHC educators			Expert scoring results		
Core Competence	**Sub-Core Competence**	**Specific elements**	**Median**	**I-CVI**	**IQR**
III. Reflection, growth and innovation	3.1 Reflection	3.1.1 Reflect on and improve personal performance in EBHC teaching	5	1	0
		3.1.2 Appropriately adopt suggestions from peers or learners regarding EBHC teaching performance	5	1	0
	3.2 Self-growth	3.2.1 Continuously update EBHC knowledge and teaching methods	5	1	0
		3.2.2 Be an EBHC role model for learners and demonstrate professionalism	5	1	0
	3.3 Innovation and research development	3.3.1 Develop new EBHC teaching models	5	1	0
		3.3.2 Develop new tools for evaluating EBHC learning effectiveness	5	1	0
		3.3.3 Play a role in teaching innovation and academic leadership within the evidence-based team (e.g., introducing new teaching tools or models, setting academic directions, promoting academic research)	4	1	1

Limitations

- First, the expert panel was limited to individuals within a specific national context, which may affect generalizability.
- Second, although content validity has been established, further studies are needed to assess construct validity and real-world applicability.
- Third, behavioral benchmarks, for example developmental milestones and observable entrustable professional activities (EPAs), are currently under development to operationalize these competencies in workplace settings.

Conclusions

- This set of core competencies can be used to guide the designing and implementing of the training of EBHC educators.
- We are developing the milestones and Entrustable Professional Activities (EPAs) to create a comprehensive competency-based roadmap for EBHC educator training.