

Competency-Based Medical Education in Brain Medicine: A Scoping Review

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INTRODUCTION

Postgraduate medical training is undergoing a shift to **Competency Based Medical Education (CBME)**, which prioritizes achievement of clinical competencies over time spent in training as a marker of progress¹. The application of CBME in brain-related disciplines is underexplored, particularly at the fellowship level².

This scoping review maps knowledge about CBME implementation in brain-based disciplines and fellowship education to inform the development of an interdisciplinary fellowship in holistic brain healthcare.

OBJECTIVES

This review addresses **three primary questions** for brain-related disciplines:

1. What is the current state of the literature on CBME for graduate-level fellowships?
2. How is competency conceptualized and implemented?
3. What lessons from previous implementations can inform future program development?

METHODS

The research was carried out in five steps using the **Arksey & O'Malley (2005)**³ framework for scoping reviews as a guide:

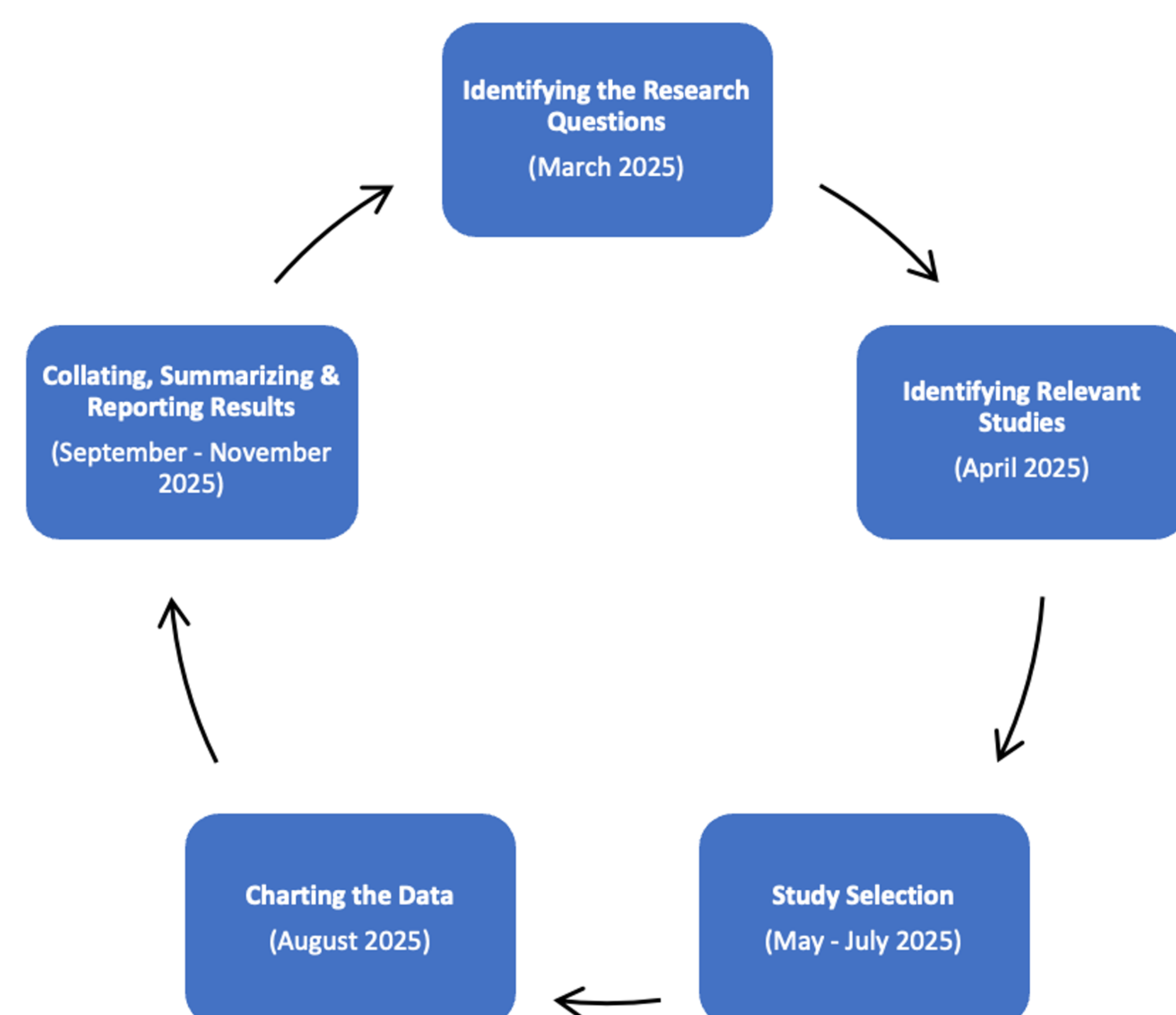


Figure 1. Five stage scoping review process based on Arksey & O'Malley (2005).

RESULTS

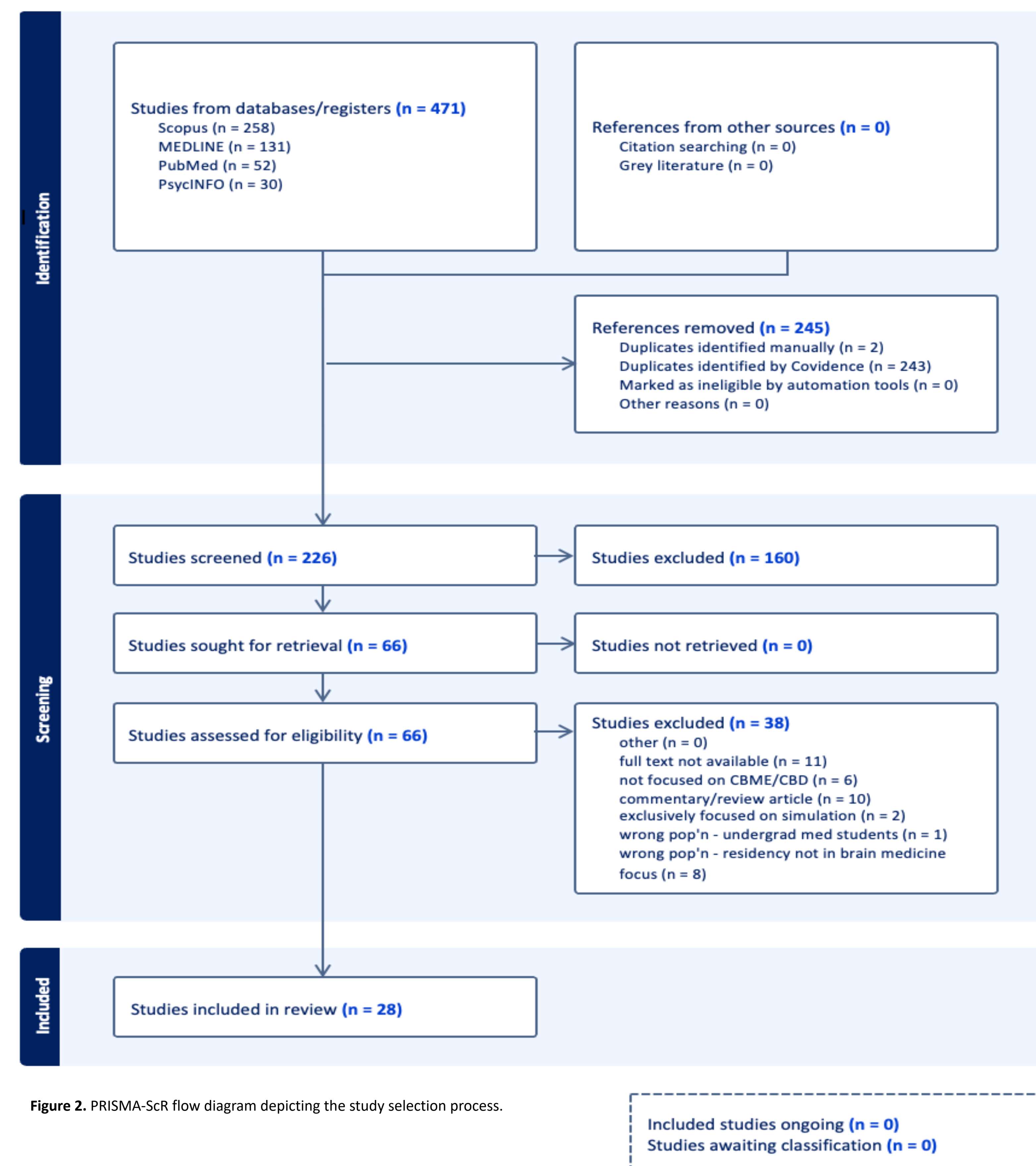


Figure 2. PRISMA-ScR flow diagram depicting the study selection process.

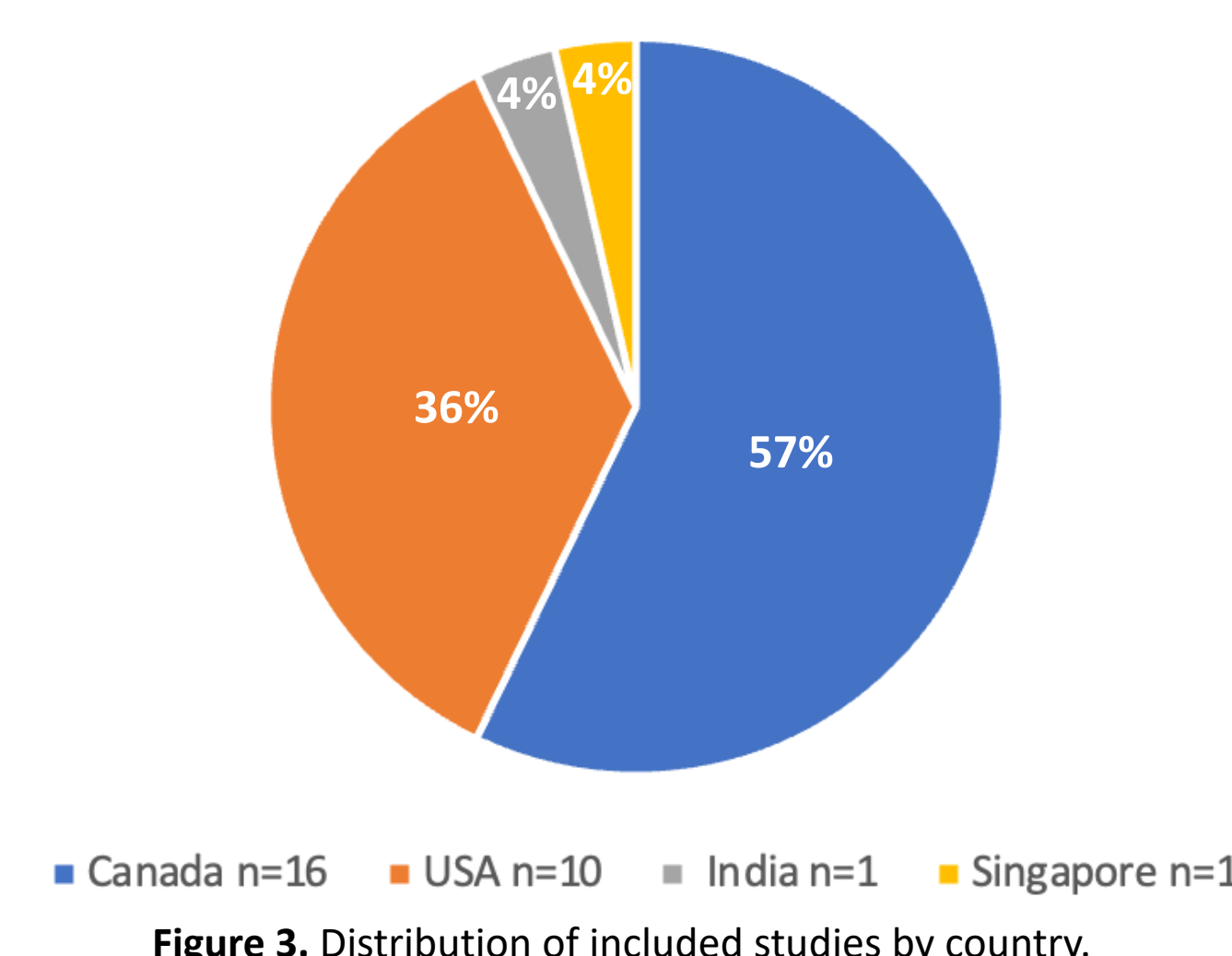


Figure 3. Distribution of included studies by country.

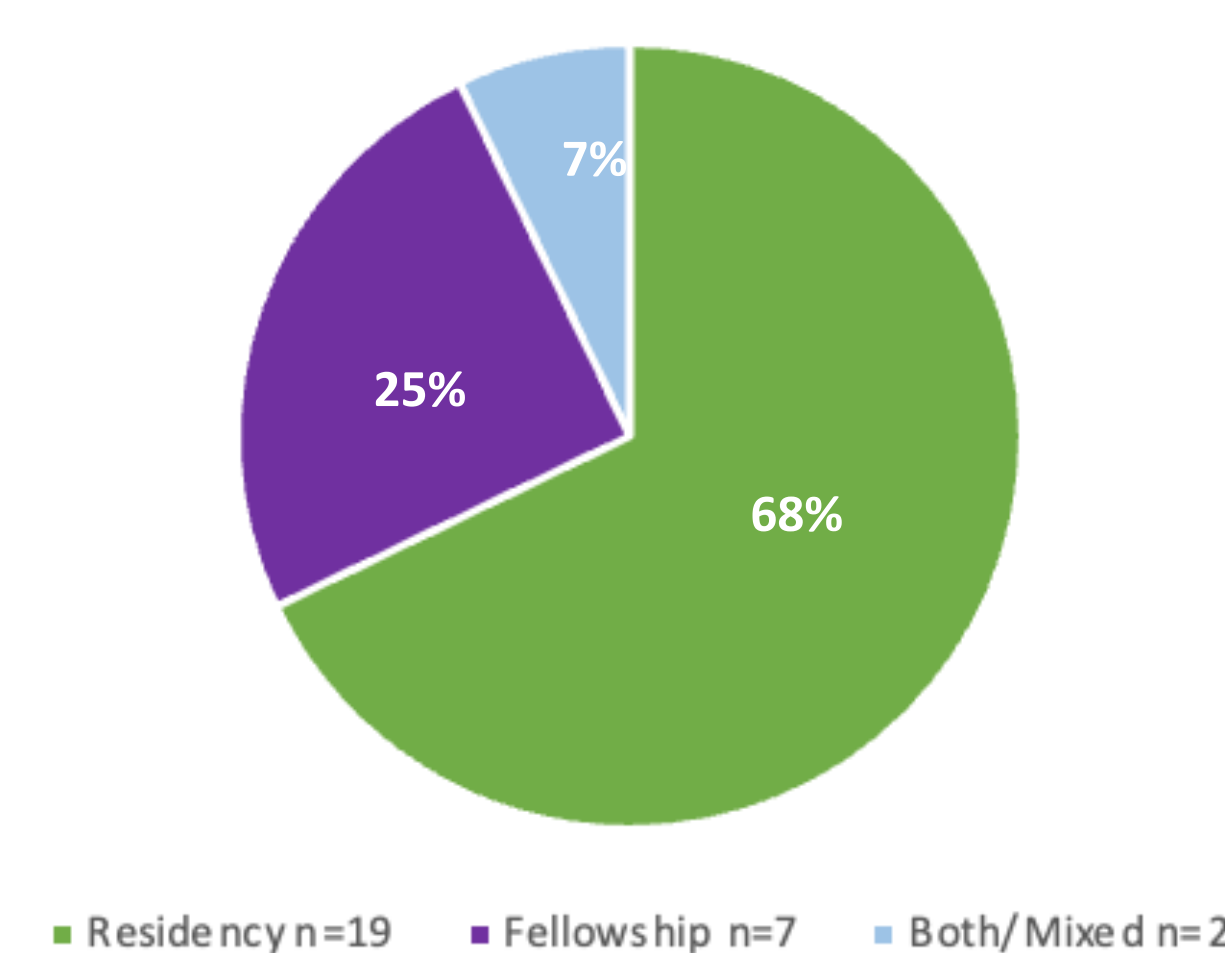


Figure 4. Distribution of included studies by program level.

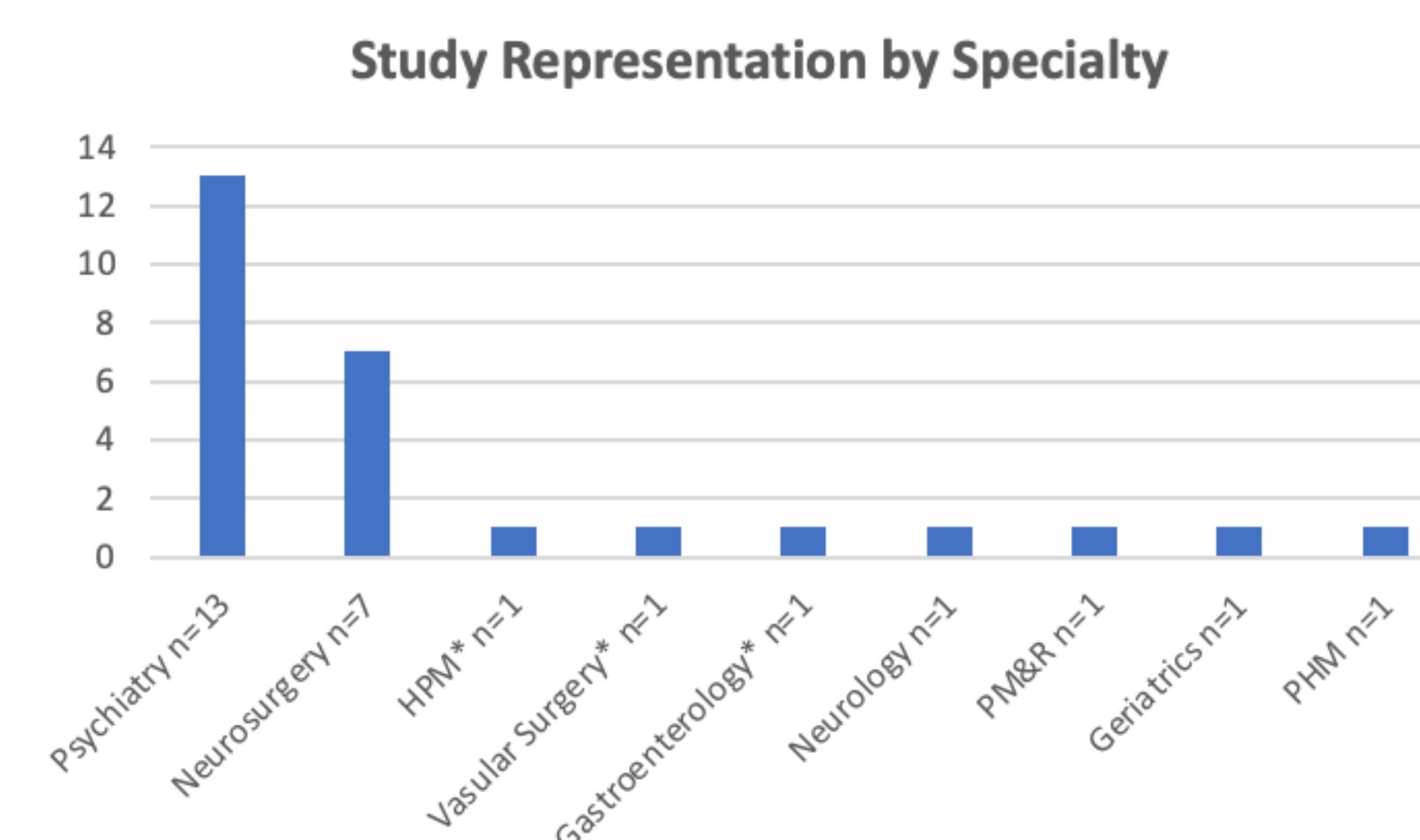


Figure 5. Distribution of included studies by specialty.

Studies marked by an asterisk* were conducted at the fellowship level and did not occur within brain-related specialties.

IMPLEMENTATION OF CBME

1. Evaluation Practices	2. Feedback	3. Supervision	4. Time Burden
Evaluations are initiated by learners more often than faculty.	Multiple forms of delivery identified (e.g., written, app based). Learners value timely and actionable feedback following direct observation.	Tension emerged when the roles of supervisor, assessor and coach became blurred.	CBME resulted in significant time burdens for both learners (scheduling assessments) and faculty (performing evaluations and feedback delivery).

Table 1. Themes related to implementation of CBME.

COMPETENCE

1. Varied Definitions	2. EPAs ≠ Competence	3. Key Markers
Definitions of competence varied across diverse settings, specialties and between assessors.	Attainment of entrustable professional activities does not always equate to competence.	Patient safety and physician autonomy are considered key markers of competence.

Table 2. Themes related to conceptualization of competence in CBME programs.

LESSONS LEARNED

1. Positive Impacts	2. Negative Impacts	3. Facilitators
CBME may result in increases in physician competence due to enhanced feedback, structure, mentorship and opportunities for reflection.	CBME may lead to time consuming assessments, superficial skill checks, gaps in essential competencies and poor collegial interactions.	The primary facilitators of CBME implementation were supportive program frameworks, stakeholder engagement, program flexibility and consistent implementation.

Table 3. Themes related to lessons learned in the literature.

CONCLUSION & FUTURE DIRECTIONS

This review synthesizes current knowledge about implementing CBME in brain medicine-related disciplines to highlight key gaps and opportunities in fellowship education.

These findings may inform the design of fellowship programs aligned with CBME frameworks in brain medicine.

Strategies for improvement include **curricular adjustments, increased learner and faculty engagement and administrative improvements.**

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1. Ferguson PC, Caverzagie KJ, Nousiainen MT, Snell L, Collaborators I. 2017. Changing the culture of medical training: an important step toward the implementation of competency-based medical education. *Med Teach*. 39(6):599–602.
2. Levitt S, Henri-Bhargava A, Hogan DB, Shulman K. The Brain Medicine Fellowship: A competency-based training program to treat complex brain disorders. *Acad Med*. 2023;98(5):590-4.
3. Arksey H, O'Malley L. Scoping studies: Towards a methodological framework. *Int J Soc Res Methodol*. 2005;8(1):19–32.