



BEME Spotlight 56

Interventions for undergraduate and postgraduate medical learners with academic difficulties: a BEME systematic review

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Review citation

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Review website

<https://bemecollaboration.org/Published+Reviews/BEME+Guide+No+56/>

Keywords

medical education, professional competence, learning difficulties, remedial teaching, teaching methods

Headline conclusions

This review provides a repertoire of 109 undergraduate and postgraduate literature-based interventions (24 strong, 48 moderate, 26 weak and 11 very weak recommendations) for teaching/learning, faculty development, and research purposes.

Background and context

Ten to fifteen percent of learners will experience difficulties during their medical training. Factors suggestive of academic difficulties during undergraduate or postgraduate medical training and educational diagnoses are well described in the medical education literature. However, clinical teachers often struggle to report unsatisfactory trainee performance, in part because they are not familiar with evidence-based remediation options (Yepes-Rios et al., 2016).

Two reviews about remediation interventions (Hauer et al., 2009; Cleland et al., 2013) stated that most interventions for learners experiencing academic difficulties do not appear to be based on explicit conceptual frameworks. Furthermore, most rely on expert advice and few appear to have been assessed; they also concluded that evidence was lacking to guide best practices to support medical learners with academic difficulties.

Review objectives

To identify interventions for undergraduate (UG) and postgraduate (PG) medical learners experiencing academic difficulties, to link them to a theory-based conceptual framework, and to provide literature-based recommendations around their use.

Review methodology

Search Strategy: This systematic review searched the MEDLINE, CINAHL, EMBASE, ERIC Education Source and PsycINFO databases combining the following concepts: 1) medical education, 2) professional competence or difficulty and 3) educational support. The literature was searched from January 1st 1990 to December 31st 2016.

Articles retrieved in previous reviews about remediation options in medical learning were added to the selection process. Relevant non-indexed journals were hand searched. In addition, three experts in the field were contacted by email to share any study results relevant to this review.

Inclusion and Exclusion Criteria: The authors included original research studies or innovation reports from a medical discipline, focusing on undergraduate students or postgraduate trainees in difficulty, describing at least one intervention strategy aimed at supporting learners with academic difficulties, and including at least one form of program evaluation. Articles were excluded if they were written in languages other than English, French, Spanish, German or Italian.

Data Extraction: For each article, the reviewers extracted data about:

- Behaviour change techniques groupings (Michie et al., 2015);
- Program evaluation and importance of outcomes, using Stufflebeam (2003)'s CIPP model (context/input/process/product) and a modified version of Kirkpatrick's classification of training outcomes (Hammick et al., 2010);
- Effectiveness of outcomes;
- Quality appraisal of studies (using the Mixed Methods Appraisal Tool (Pluye et al., 2011).

Data Synthesis: Each type of intervention was mapped to the relevant educational diagnoses (knowledge, skills, attitudes, learner, teacher, and environment). The authors synthesized extracted evidence by adapting the GRADE approach (www.gradeworkinggroup.org) to formulate recommendations for each intervention (strong, moderate, weak and very weak).

Summary of remediation interventions with strong evidence for medical learners with academic difficulties

Remediation interventions under each Behaviour Change Technique Groupings	Level		Educational diagnosis					
	Undergraduate	Postgraduate	Knowledge	Skills	Attitude	Learner personal issues	Teacher	Learning environment
ANTECEDENTS								
Course extension	•		•	•				
Curriculum content review (reduction of unnecessary details) at the program level	•							•
Curriculum decompression	•						•	•
Eliminating norm-referenced exam performance data (e.g., z scores, ranks) and set a criterion-referenced total score for passing the course	•							•
Pass/fail grading system	•							•
Reduced contact hours across the first two years of the curriculum by approximately 10%	•							•
Reschedule a course at a relevant timing of curriculum	•							•
ASSOCIATIONS								
Standardized clinical reasoning remediation plan	•	•	•					
GOALS AND PLANNING								
Remedial program/tool	•	•	•	•	•	•		
REGULATION								
Formal psychomotor/learning assessment and therapy		•					•	
Leave of absence		•					•	
REGULATION (continued)								
Resilience and mindfulness program	•							
Stress management/well-being training (interactive sessions)	•	•					•	
Substance abuse rehabilitation		•					•	
REPETITION AND SUBSTITUTION								
Longitudinal electives	•		•	•	•	•		
Research	•			•			•	
Service opportunities	•							•
SHAPING KNOWLEDGE								
Preparation course/program	•		•	•	•			
Required conferences	•	•	•	•			•	
SOCIAL SUPPORT								
Learning communities	•		•	•	•	•		•
Mentoring	•	•	•	•	•	•		
Social events	•							•
Tutorials	•		•	•	•	•		
Tutoring and academic assistance	•	•	•	•	•	•		

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Implications for practice

This review provides clinical teachers and educators with a repertoire of literature-based interventions to use for assessment, mentoring and faculty development purposes. It encourages the use of the most effective literature-based interventions to support undergraduate and postgraduate medical learners with academic difficulties, and helps identification of program evaluation gaps to stimulate further educational scholarship and research in the field. Further development of interventions for learners experiencing academic difficulties should build upon effective BCTs and test the unexplored ones. Scholarship efforts should also reinforce the importance of thorough program evaluation.

References

- Cleland J, Leggett H, Sandars J, Costa MJ, Patel R, Moffat M. 2013. The remediation challenge: theoretical and methodological insights from a systematic review. *Med Educ.* 47(3):242-251.
- Hauer KE, Ciccone A, Henzel TR, Katsufakis P, Miller SH, Norcross WA, Papadakis MA, Irby DM. 2009. Remediation of the deficiencies of physicians across the continuum from medical school to practice: a thematic review of the literature [Review]. *Academic Medicine.* 84(12):1822-1832.
- Hammick M, Dornan T, Steinert Y. 2010. Conducting a best evidence systematic review. Part 1: From idea to data coding. *BEME Guide No. 13. Medical teacher.* 32(1):3-15.
- Michie S, Wood CE, Johnston M, Abraham C, Francis JJ, Hardeman W. 2015. Behaviour change techniques: the development and evaluation of a taxonomic method for reporting and describing behaviour change interventions (a suite of five studies involving consensus methods, randomised controlled trials and analysis of qualitative data). *Health technology assessment (Winchester, England).* 19(99):1-188.
- Pluye P, Robert E, Cargo M, Bartlett G, O'Cathain A, Griffiths F, Boardman F, Gagnon MP, Rousseau MC. 2011. Proposal: A mixed methods appraisal tool for systematic mixed studies reviews. Montreal, Canada. : Department of Family Medicine, McGill University; [accessed 2017-02-01]. <http://mixedmethodsappraisaltoolpublic.pbworks.com>.
- Stufflebeam DL. 2003. The CIPP model of evaluation. In: Kellaghan T, Stufflebeam D, Wingate L, editors. *International handbook of educational evaluation.* Springer international handbooks of education.
- Yepes-Rios M, Dudek N, Duboyce R, Curtis J, Allard RJ, Varpio L. 2016. The failure to fail underperforming trainees in health professions education: A BEME systematic review: *BEME Guide No. 42. Med Teach.* 38(11):1092-1099.