

- Develop a competency framework for healthcare professionals in EBP and clinical effectiveness education.
- Inform academic curricula and professional development programmes at third level.
- Provide a guide for attainment of knowledge, skills and attributes/behaviours for health service staff.
- Dissemination of the competency framework to Irish statutory health regulators and educators, to inform professional standards for registration courses and continuous professional development of healthcare professionals in Ireland.

Method Multiyear project (2016–2019):

- Baseline research on the teaching of evidence-based practice in Ireland; literature review, interviews with international experts and national survey of EBP teaching at third-level institutions
- Two national consultation events on EBP education in Ireland with regulators, researchers and educators
- Analysis of health regulators requirements in Ireland in relation to education and professional standards
- Development of a competency framework by UCC; documentary analysis of national and international documents pertaining to EBP and clinical effectiveness education; relevant competencies, curriculum considerations, teaching & learning methods and assessment strategies
- Stakeholder consultation; 13 focus groups with representatives from the health services, clinical practice, third level education & professional training sectors, regulator/accrediting bodies, and the Department of Health, to examine draft competency framework
- Policy makers in the Department of Health, health service providers and the regulators of health professionals (medicine, nursing and allied health professionals) convened an implementation group to oversee dissemination and implementation.

Results Evidence-based practice is a core component of clinical effectiveness. Additional competencies in quality improvement processes and implementation science strategies were deemed essential for patient outcomes. Professional practice competencies which addressed the need for effective communication, collaborative practice and leadership were specifically recommended.

An overarching inter-disciplinary competency framework was proposed for clinical effectiveness education, which included the following domains: Evidence-based practice; Quality improvement processes; Implementation strategies and Professional practice.

Stakeholders recommended the *explicit* integration of EBP competencies throughout academic and clinical learning domains of health professional curricula.

Teaching methods recommended were based on an active learning approach and included: group-based projects; role-play/modelling; simulations and case-based studies that aid learners to apply and relate theory to real-world practice.

Conclusions A competency framework for clinical effectiveness education for health and social care professionals was published by the Department of Health in Ireland in 2018. It is intended that this framework will provide guidance to health-care educators and regulators in the blueprinting of curricula,

learning outcomes, assessment strategies, and graduate/clinician attributes.

By means of consultation with stakeholders and working in collaboration with regulators and policy makers, we can translate evidence into policy and practice, to improve patient outcomes.

Through inclusion of evidence-based practice in the curricula of all healthcare professionals at both undergraduate and post-graduate level, we aim to build capacity, educate health professionals to make informed choices, enhance real-world practice and encourage the next generation of leaders in evidence-based healthcare in Ireland.

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EBM+: INCREASING THE SYSTEMATIC USE OF MECHANISTIC EVIDENCE

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Objectives The EBM+ programme seeks to ensure that existing evidence of mechanisms is systematically evaluated when assessing the effectiveness of an intervention or the effects of an exposure. Basing assessments on mechanistic studies in addition to clinical studies leads to more reliable assessments and can sometimes speed up the time taken to make decisions.

The objectives of this paper are to:

1. Describe the aims of the EBM+ programme;
2. Explain the rationale behind the EBM+ programme;
3. Describe EBM+ methods for systematically assessing mechanistic evidence;
4. Discuss the feasibility of the EBM+ approach.

Method Objectives 1-3 of the paper will be met by discussing the EBM+ programme as set out by Parkkinen et al. (2018), *Evaluating evidence of mechanisms in medicine*, Springer, <https://link.springer.com/book/10.1007/978-3-319-94610-8>

The EBM+ programme arose from recent philosophical work on the epistemology of causality. Objectives 1 and 2 will be met by explaining what this work is, why it is new and interesting, and how it could lead to more systematic use of existing evidence in medicine and public health.

Objective 3, an account of the EBM+ methods for assessing mechanistic evidence, will be met by providing an overview of the methods set out in Parts II and III of Parkkinen et al. (2018), which cover (i) gathering evidence of mechanisms; (ii) evaluating evidence of mechanisms; and (iii) using evidence of mechanisms to evaluate efficacy and external validity.

Objective 4 will be met by providing a new feasibility analysis of EBM+.

Results The results of the feasibility analysis include:

- A critical analysis of four different grounds for thinking the EBM+ approach might be feasible to implement in practice. Two of these lines of argument are shown to fail, while two are shown to provide good evidence for the feasibility of EBM+.
- A critical analysis of the objection that the EBM+ approach is prone to bias and subjectivity. Four responses to that objection are considered, with one shown to fail and three to be successful.

Conclusions EBM+ is shown to provide a promising programme for making better use of existing evidence when assessing interventions and exposures.

Concerns about infeasibility, bias and subjectivity can be allayed, although some attempts to tackle these concerns are unsuccessful.

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A MULTIFACETED, CLINICALLY INTEGRATED EVIDENCE BASED MEDICINE CURRICULUM IMPROVES MEDICAL STUDENTS' COMPETENCY AS MEASURED BY THE FRESNO TEST

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Objectives The University of Buckingham Medical School (UBMS) is an independent medical school in the UK. Following feedback from students that they struggled to understand the relevance of Evidence Based Medicine (EBM) to clinical practice, the EBM curriculum was revised. A longitudinal, competency based, multifaceted, clinically integrated curriculum, with assessments has been designed and implemented. The aim of this study was to assess the effectiveness of the new EBM curriculum to improve students' competency using the validated Fresno test and their attitudes.

Method Blended learning approaches have been incorporated with a mix of didactic lectures, facilitated small group discussions and peer teaching of phase I (years one and two) students of the relevance of EBM to clinical practice by phase II (years three and four) students using their personal experiences in clinical rotations. Formative and summative assessments have been designed to capture written demonstration of EBM knowledge and skills as applied to clinical scenarios in short answer format.

All students from the 2017 cohort that experienced the first iteration of the integrated curriculum were invited to participate. The Fresno test of EBM competence was administered as a formative assessment test before and after the EBM teaching through our virtual learning environment. Self-reported students' attitudes and knowledge of EBM, its relevance to clinical practice were assessed and students were invited to participate in a focus group discussion at the end of EBM teaching.

Results Of the 83 students invited, 31 participated at baseline (37.3%) and 55 participated at the end of the study (66.3%). 18 students attempted the Fresno test at baseline as well as at follow-up. The average score for the test was significantly higher after teaching than at baseline, with the average score increasing by 38.7 marks, from 29.3 at baseline to 68.0 after teaching ($p < 0.001$). Analyzing responses to questionnaires from the same 18 students, showed that compared to baseline, after EBM teaching, a higher proportion of students felt confident in critically appraising journal articles and in formulating clinical questions to search for evidence. Five students participated in the focus group discussion and key themes identified were increased students' perceptions of the relevance of EBM to clinical practice, preference for interactive workshops over didactic lectures for literature searching skills and incorporating EBM teaching across the curriculum.

Conclusions It has been feasible to design and implement a multi-faceted, clinically integrated EBM curriculum in

undergraduate medical education. Early evaluation of the curriculum using the Fresno test and focus group discussions has shown an improvement in EBM knowledge, skills and students' perceptions of the clinical relevance of EBM. The Fresno test has been a useful formative assessment to assess medical students' competency in EBM- the first three steps-ask, acquire and appraise.

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CHILDHOOD CANCER HEALTH OUTCOMES IN EGYPT: TEN-YEAR REAL-WORLD EVIDENCE FROM CHILDREN'S CANCER HOSPITAL 57357 – EGYPT (CCHE) AND COMPARISON WITH RESULTS FROM ENGLAND

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Objectives To study childhood cancer survival and health outcomes over the last ten years in one Egyptian hospital CCHE (Children's cancer Hospital 57357 Egypt); determine the variations in survival by demographic, cancer type, and disease severity differences and the reasons behind these variations; and compare childhood cancer survival outcomes with results from England.

Method A retrospective observational cohort study was conducted for children (age 0-18 years) with confirmed cancer diagnosis who presented at CCHE for treatment from 2007 until 2017 and were followed up until July 2018. Confirmed diagnosis of childhood malignancy followed the WHO/ICCC-3 criteria. Patients' demographic data were extracted from hospital-based cancer registry, while disease-related and health outcomes data were extracted from hospital disease-specific registry. Health outcomes included 5-year survival rates, age-standardized mortality rates, and trends in disease relapse/progression. Five-year overall survival was calculated for each childhood cancer type using Kaplan Meier analysis. The 5-year overall survival rates at CCHE were compared to population-based 5-year survival of children with cancer in England [2001–2015]. Comparable survival was defined as $< 10\%$ difference and $> 10\%$ as inferior survival. Patients' demographics were described for the full-analysis population, and health outcomes evaluation was done for the evaluable population, based on intention-to-treat analysis.

Results A total of 15,997 children with cancer were analyzed; 58% were males and 42% females. Most of the patients (48%) were in the youngest age group [0–4 years]. Fifty-nine percent of patients had solid tumors and 41% had hematologic malignancies. The most common cancers were Leukemia, Lymphoma, CNS tumors, and Neuroblastoma. Survival was calculated for 14,553 patients, representing 92.2% of full study population. 5-year survival rates at CCHE were comparable for some cancer types; 95.6% for Hodgkin's Lymphoma; 81% for Non-Hodgkin's Lymphoma; 92.3% for Retinoblastoma; 82% for Renal tumors; 66.4% for CNS tumors; 65.9% for Ewing Sarcoma; 86.9% for Germ cell tumors; 61% for Rhabdomyosarcoma; 77.1% for other soft tissue tumors; and 91.2% for CML. Whereas for other cancer types, overall