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The impact of near-peer teaching methods in undergraduate and postgraduate surgical education using the Kirkpatrick evaluation model: a systematic review

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ADMINISTRATIVE INFORMATION

Support - None.

Review Stage at time of this submission - Formal screening of search results against eligibility criteria.

Conflicts of interest - None declared.

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Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 08 May 2024 and was last updated on 08 June 2024.

INTRODUCTION

Review question / Objective What is the impact (outcome) of near-peer teaching (intervention) on learners and tutors in surgical education (population) compared to other teaching methods (comparison) using the Kirkpatrick evaluation model?

Rationale The hypothesis for this study is that near-peer teaching (NPT) offers significant, objective, positive impacts on surgical education. The Kirkpatrick evaluation model will be used for evaluating the impact of any NPT programmes on surgical educational outcomes. The primary outcome measures will be an analysis of the reported impacts on knowledge and/or skills development; behavioural changes; and organisational practice/impact on patient care

(Kirkpatrick levels 2, 3 and 4, respectively). The secondary outcome measures will be focused on the student and tutor satisfaction ratings for the use of NPT within surgical education (Kirkpatrick level 1) and an analysis of any significant limiting factors/challenges observed for NPT implementation.

Condition being studied Near-peer teaching (NPT) refers to the delivery of educational sessions by academic or clinical colleagues who are at least one year ahead on the academic or clinical spectrum. Examples of this includes: fifth-year medical students teaching third-year medical students (undergraduate tutor and learner); postgraduate year 4 surgical residents teaching foundation year 2 doctors (postgraduate tutor and learner); or a foundation year 2 doctor teaching a fifth-year medical student (postgraduate tutor and undergraduate learner).

METHODS

Search strategy PubMed, MEDLINE, Embase, CINAHL and PsycINFO will be searched from inception to March 30, 2024. No language restrictions will be used for the search.

Participant or population The population of interest will be tutors (doctors or medical students) and students (undergraduate medical students or postgraduate trainee doctors) within undergraduate and/or postgraduate surgical education, including orthopaedics and dental surgery.

Intervention Only studies that have a clear utilisation of near-peer teaching methods for the delivery of teaching and learning. Studies that utilise near-peer teaching methods in addition to other teaching methods will be included only if the results for the near-peer teaching cohort are clearly delineated for analysis within the articles.

Comparator A comparison of near-peer teaching (NPT) methods with other educational strategies will be performed where this is reported in relevant articles (for example, NPT versus peer-to-peer teaching).

Study designs to be included The study design types to be included will include: all randomised controlled trials (RCTs); non-randomised interventional studies; observational studies; and case series involving at least five participants. The cut-off of at least five participants is in-line with published guidance (evidence for this will be provided in the main manuscript), though the peculiarities and context for each study will also be considered. Any studies with less than five participants; narrative reviews; letters to the editors; and conference abstracts (with no full text articles) will be excluded. Studies that utilised NPT in non-surgical disciplines will also be excluded.

Eligibility criteria These is as described in the PICOS criteria.

Information sources PubMed, MEDLINE, Embase, CINAHL and PsycINFO will be searched from inception to March 30, 2024. No language restrictions for the search. Furthermore, any relevant article citations identified from the reference lists of the identified articles will be included.

Main outcome(s) The primary/main outcome measures will be the impact of NPT on organisational practice (for example, improved

patient reported outcome measures in centres/units following the implementation of NPT methods); impact on behavioural changes within real-life patient care (for example, improved technical skills amongst resident doctors during surgical operations); impact on knowledge and/or skills development amongst medical students and doctors-in-training (for example, improved knowledge on how to catheterise a patient or improved basic surgical skills demonstration within an objective structured clinical examination). These primary outcomes are matched to levels 4, 3 and 2 of the Kirkpatrick evaluation model, respectively. These outcome measures will be assessed to ascertain if any changes occurred from baseline to the last follow up period in each study.

Additional outcome(s) The secondary outcome measures will be focused on the students' and tutors' satisfaction ratings for the use of NPT within surgical education (for example, Likert scale survey ratings on medical students perceived improved confidence on their clinical examinations skills). These are mapped to level 1 on the Kirkpatrick evaluation model. These outcome measures will be assessed to ascertain if any changes occurred from baseline to the last follow up period in each study. Furthermore, challenges and limitations encountered with the implementation of NPT will also be assessed.

Data management All identified article citations will be imported into the Rayyan systematic review software where removal of duplicates, abstract screening and identification of relevant articles for final inclusion will be performed.

Quality assessment / Risk of bias analysis Because it is anticipated that there will likely be a mix of quantitative, qualitative and mixed-methods studies in this review, the quality appraisal for the included randomised controlled trials, qualitative, quantitative, and mixed-methods studies will be performed using the mixed methods appraisal tool (MMAT, 2018 version). Relevant tables and diagrams summarising the quality appraisal results will be included. This will be performed by the two authors and any disagreements in the quality appraisal process will be settled by consensus discussion.

Strategy of data synthesis For this systematic review, PubMed, MEDLINE, Embase, PsycINFO and CINAHL databases will be searched from inception till date. The reference lists for relevant articles will also be searched for any articles that meet the inclusion criteria. The search terms will include "near-peer", "teach*", "learn*", "tutor*",

“surg*”, “orthopaedics”, “educat*”, “train*”. The relevant BOOLEAN terms “AND” and “OR” will be utilised for the relevant terms within each database (the full search strategy will be attached as appendices in the final published journal article). There will be no specific search term restrictions for the database search. However, only peer-reviewed articles with identifiable full text English language translations will be included in the article final inclusion. All identified article citations will be imported into the Rayyan systematic review software where removal of duplicates, abstract screening and identification of relevant articles for final inclusion will be performed. The two authors for this study will be involved in the article screening and selection stage. Any disagreements regarding certain articles will be settled by consensus. A PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-analyses) flowchart will be included summarising the article screening and selection strategy.

The summary data for the identified articles will be presented using a descriptive synthesis, as it is anticipated that there will be significant heterogeneity in this study negating the conduct of a proper meta-analysis. Pooled data synthesis or meta-analysis will only be performed if studies report on homogenous or similar outcome measures. Reported statistical summary data and p values for each outcome measure in each study will be presented as described.

Subgroup analysis A sub-group analysis of the outcomes in the undergraduate medical education will be performed, with a separate sub-group analysis for the outcomes in postgraduate surgical education.

Sensitivity analysis Not applicable.

Language restriction No language restrictions for the initial search. However, only abstracts with available full text English articles will be selected for final inclusion.

Country(ies) involved United Kingdom.

Other relevant information This systematic review is also registered with the University of South Wales as a "low-risk study" as part of a masters in medical education dissertation project.

Keywords near-peer teaching; medical education; surgical education; learning outcomes; Kirkpatrick evaluation model; medical students; resident doctors; doctors-in-training; patient reported outcomes.

Dissemination plans Following completion of this dissertation and release of the final module results, approval will be sought from the relevant USW personnel and project tutor for the submission of sections of this dissertation to PubMed-indexed peer-reviewed journals for publication and for conference presentation.

Contributions of each author

Author 1 - Fitzgerald Anazor - Conceptualisation; protocol drafting; protocol review; protocol registration; methodology-design of the search strategy; methodology-searching and screening of articles for eligibility; methodology-quality appraisal of the included studies; methodology-synthesis of results; writing-original draft of the manuscript; writing-review of the final draft of the manuscript.

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Author 2 - Marco Grech - Conceptualisation; protocol review; methodology-screening of articles for eligibility; methodology-quality appraisal of the included studies; writing-review of the final draft of the manuscript.

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