Work-based learning interventions for antimicrobial stewardship: a systematic review

Citation

Darren Langdridge, Rachel McMullan, Jennika Virhia, Duncan Banks, Koula Charitonos, Santoshi Giri, Peter Olupot-Olupot, Abhinav Vaidya. Work-based learning interventions for antimicrobial stewardship: a systematic review. PROSPERO 2023 CRD42023447115 Available from:
https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42023447115

Review question

The aim of the review is to provide the best quality evidence regarding the effectiveness of post-qualification work-based learning interventions designed to improve antimicrobial stewardship (AMS). AMS improvement is to be identified but likely to include increased knowledge, greater awareness, and changed behaviour.

The specific objectives are to assess:

(1) The nature and scope of extant post-qualification work-based learning interventions designed to improve AMS

(2) How effectiveness is operationalised (as e.g., greater awareness, increased knowledge, changed behaviour)

(3) The effectiveness of post-qualification work-based learning education interventions on target stewardship outcomes

(4) Whether technology-supported learning interventions are effective in improving AMS

The review will address the following research questions:

(1) What educational resources are used in post-qualification, work-based education for AMS?

(2) How is antimicrobial stewardship conceptualised and measured?

(3) Are there discernible patterns of post-qualification work-based learning interventions associated with effectiveness?

(4) Is there any evidence of the value of technology-supported educational interventions?

Searches

Searches will be conducted in three stages:

1. Electronic databases will be searched for published work. The following databases will be searched: CINAHL; Cochrane Central Register of Controlled Trials (CENTRAL); EMBASE; MEDLINE (via PubMed); PsycINFO; Scopus; Web of Science (SSCI).

The specifications of the electronic search will involve controlled vocabulary (e.g., MeSH or indexing terms) and search strategies will be tailored for each database.

2. Trials registers will be searched for ongoing and recently completed trials.

3. Reference lists of published studies will be searched, and citation searches of key studies and any other reviews will be conducted. Google Scholar will be added at this stage of the search process as an additional check.

Authors of included studies will be contacted for further information where necessary (for example, missing data, training manuals, intervention manuals, detailed descriptions, fidelity measures).

Time period - 2013 – 2023 and publication in English only.

Searches will be re-run prior to final analysis and any further studies identified, retrieved for inclusion.

Types of study to be included

The review will consider a range of experimental designs, including, but not limited to, randomised trials, interrupted time series studies and quasi-experimental designs such as non-randomised trials, controlled before and after studies.

Because this review aims to provide the best quality evidence regarding the effectiveness of antimicrobial interventions to enhance professional learning, study designs listed above will be prioritised. Non-controlled before and after studies will potentially be included in the review depending on search results and the number of relevant studies.

Qualitative studies will also be examined where part of the programmatic work separately tests effects of post-qualification work-based learning interventions.

Thus, final decision regarding inclusion of this design in the review will be made following the search.

Condition or domain being studied

Antimicrobial stewardship

Participants/population

The review will consider all studies that target professionals in receipt of post-qualification work-based learning interventions.

Intervention(s), exposure(s)

The review will consider all post-qualification work-based learning interventions designed to improve antimicrobial stewardship for human health. This will include educational interventions whether combined with other intervention components or not. If combined with other interventions, there must be a clear mechanism of evaluation of the educational component alone. To be included, studies must include an educational intervention described in sufficient detail to ascertain mode of delivery and outcome.

Comparator(s)/control

The review will consider all studies with any of the following control conditions:

• Time bound or geographical controls

• No exposure

Context

Studies concerned with post-qualification work-based learning to improve AMS in relation to human health.

Main outcome(s)

The review will consider all studies which have relevant short, medium or long-term outcomes related to antimicrobial stewardship behaviours, including but not limited to:

(1) Knowledge/awareness of antimicrobial resistance.

(2) Learning - antimicrobial resistance knowledge; antimicrobial skills; antimicrobial health literacy.

(3) Changed behaviour – prescribing practice; lab processes.

Additional outcome(s)

The review will consider unanticipated or negative consequences of interventions designed to improve antimicrobial stewardship among professionals (such as, but not limited to: resistance to compulsory education, clashes with existing setting practice, cross-cultural tensions; loss of autonomy; fear of withholding antimicrobials; disagreement with guidelines).

Data extraction (selection and coding)

Inclusion and exclusion criteria will be applied successively to titles and abstracts. Full reports will be obtained for those studies that appear to meet the criteria or where there is insufficient information from the title and abstract. Screening of titles and abstract and full texts will then be performed by a reviewer with assistance from other team members. Decisions will be double-checked. A third reviewer will be asked to resolve any discrepancies where consensus cannot be reached between the two reviewers at this stage. Covidence will be used to record decisions.

A standardised framework will be devised for data extraction. This framework will be applied to all full text papers that fulfil the eligibility criteria. The following data will be extracted:

• Study design: trial design and quality, data collection methods, modes and techniques, validity of tools, adherence to protocol (attempts will be made to retrieve protocols from searches, including by contacting the authors), statistical and other analyses.

• Participants (intervention and control): demographic characteristics (e.g., age, ethnicity); target learner group.

• Intervention: purpose and aim of intervention; setting and recruitment methods, components of the intervention, details of modes of delivery (e.g., use of educational technology) and any other aspects of content, frequency, intensity and duration of the intervention, educational framework employed in intervention design; any concomitant interventions included in the study.

• Outcomes: all short, medium and long-term outcomes (described above). Data extraction will be conducted by one independent reviewer and checked by a second reviewer. Any discrepancies will be resolved through discussion between the two reviewers or by adjudication by a third reviewer when necessary.

A minimum of two requests will be made to study authors for any missing data and intervention materials.

Risk of bias (quality) assessment

The risk of bias in individual studies will be assessed by one reviewer and checked by a second reviewer using standard EPOC risk of bias criteria (EPOC, 2015). Any disagreements will be subject to checks from a third reviewer.

Eligible studies will not be excluded based on the quality assessment, but the strengths and limitations of the evidence base will be highlighted in a narrative discussion.

Strategy for data synthesis

Individual study characteristics and outcomes will be summarised and presented in an evidence table. The study will identify and summarise the existing evidence on post-qualification work-based learning interventions designed to improve AMS among professionals working in human health.

A narrative synthesis will be employed due to the likelihood of different types of interventions being deployed in the included studies. A narrative synthesis is the most appropriate mode of synthesis because, with the broad inclusion criteria of the study designs, there will likely be high levels of heterogeneity resulting from variations in the definitions, measures, sample designs, modes of data collection, time of data collection, and populations. Due to this, Popay's four-stage framework will be used to increase the robustness, transparency, and consistency of the narrative synthesis process (Popay et al., 2006). This involves summarizing and organizing the extracted data thematically, identifying patterns, and exploring relationships between different factors. This synthesis approach will provide a coherent and comprehensive

understanding of the key factors within the literature.

We shall adopt the analytic strategy of Price et al., (2018). As such, studies will be grouped into those meeting or not meeting the EPOC criteria and categorized according to the target population. In order to identify patterns of effectiveness, identified studies will be mapped across five categories of intervention effectiveness.

In addition, if sufficient interventions are suitable and materials are made available, intervention descriptions and materials will be systematically analysed for their affective components following the method developed by Professor Langdridge (Langdridge et al., 2019; Langdridge et al., 2021).

References:

Langdridge, D., et al., (2019). The effectiveness of interventions to increase antimicrobial stewardship: a visual affective analysis. British Journal of Health Psychology, 24, 66-87.

Langdridge, D., et al., (2021). A qualitative examination of affect and ideology within mass media interventions to increase HIV testing with gay men garnered from a systematic review. British Journal of Health Psychology, 26(1), 132-160.

Popay et al., (2006). Guidance on the conduct of narrative synthesis in systematic reviews. ESRC Methods Programme.

Price L., et al., (2018). Effectiveness of interventions to improve the public's antimicrobial resistance awareness and behaviours associated with prudent use of antimicrobials: a systematic review. Journal of Antimicrobial Chemotherapy, 73(6), 1464-1478.

Analysis of subgroups or subsets

Dependent on availability of data, the following subgroups will be considered for separate analysis using the strategy described above: interventions delivered in low- and middle-income countries (LMICs); technology supported learning interventions.

Contact details for further information

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Organisational affiliation of the review

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Type and method of review

Narrative synthesis, Systematic review

Anticipated or actual start date

02 August 2023

Anticipated completion date

22 December 2023

Funding sources/sponsors

The Open Societal Challenges (OSC) Fund, The Open University, Walton Hall, Milton Keynes, MK7 6AA

Grant number(s)

State the funder, grant or award number and the date of award

The Open Societal Challenges (OSC) Fund, The Open University, Walton Hall, Milton Keynes, MK7 6AA

Conflicts of interest

Language

English

Country

England

Stage of review

Review Ongoing

Subject index terms status

Subject indexing assigned by CRD

Subject index terms

MeSH headings have not been applied to this record

Date of registration in PROSPERO

24 July 2023

Date of first submission

20 July 2023

Stage of review at time of this submission

The review has not started

Stage	Started	Completed
Preliminary searches	No	No
Piloting of the study selection process	No	No
Formal screening of search results against eligibility criteria	No	No
Data extraction	No	No
Risk of bias (quality) assessment	No	No
Data analysis	No	No

The record owner confirms that the information they have supplied for this submission is accurate and complete and they understand that deliberate provision of inaccurate information or omission of data may be construed as scientific misconduct.

The record owner confirms that they will update the status of the review when it is completed and will add publication details in due course.

Versions

24 July 2023