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Task sharing to improve the prevention, diagnosis and management of rheumatic heart disease: a systematic review protocol

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ABSTRACT

Introduction Rheumatic heart disease (RHD) remains an important cause of cardiovascular morbidity and mortality globally due to weak health systems in many countries. RHD can be effectively prevented and managed; however, RHD-related interventions have not been widely adopted in countries with severe human resource constraints. Task sharing is a recognised approach to personnel shortages that could prove effective for RHD and has, anecdotally, been attempted in a few settings. We propose a systematic review and meta-analysis protocol to assess models that use non-physician workers to expand access to, and quality of, RHD-related healthcare.

Methods We will include randomised controlled trials (RCT), cluster RCTs, quasi-experimental and controlled before and after studies providing information on the effectiveness of non-physician workers in providing care for streptoccocal pharyngitis, rheumatic fever and RHD. We will search relevant electronic databases and grey literature using medical subject headings. Standardised data extraction forms will be used to collect effect sizes that will be pooled in random-effects models. We will also conduct subgroup analyses and note other important quantitative findings, such as cost reduction, and qualitative findings, such as patient satisfaction. We will also assess study quality and risk of bias and metabias.

Ethics and dissemination Ethics approval is not required for this systematic review of previously published literature. The results of the systematic review will be broadly disseminated via conference presentations, multidisciplinary workshops and peer-reviewed publications.

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INTRODUCTION

Rheumatic heart disease (RHD) remains a major cause of morbidity and mortality in low/middle-income countries.[1 2] It is a chronic heart valve disease that results from untreated streptococcal pharyngitis infections that lead to acute rheumatic fever (ARF) and RHD. Over the past few decades, RHD mortality has declined in high-income countries and a number of middle-income countries, owing both to

Strengths and limitations of this study

► This is the first systematic review protocol that has investigated the effectiveness of task shifting/sharing in the prevention, diagnosis and management of rheumatic heart disease (RHD).
► Our protocol will potentially review a wide range of studies that assess the effects of task-sharing interventions.
► We propose a flexible, logic model based approach to data extraction and synthesis, which is essential since the actual intervention designs are likely to vary significantly across settings and by type of care (prevention vs treatment, etc).
► The review will be limited by including only articles in English.
► The findings of this study could inform policy and practice by providing guidance on best practices in task shifting/sharing in the prevention, diagnosis and management of RHD. At a minimum, the study will identify a research agenda in this area.

improvements in living conditions (ie, reduced transmission of streptococcal infections) and to the scale-up of prevention and treatment interventions in healthcare settings.[3 4] Nevertheless, RHD remains a major problem in many parts of the world. In 2015, there were approximately 320 000 deaths from RHD and 33 million individuals living with RHD.[5] In sub-Saharan Africa, South Asia and Oceania, the overall prevalence of RHD was estimated at 10–15 per 1000.[6–8]

RHD can be prevented by means of community-based programmes that increase awareness and early detection of sore throat, ARF and RHD.[9] According to WHO, successful prevention of ARF and control of RHD involves a multipronged strategy that includes disease-specific education, treatment of streptococcal infection (primary prevention), provision of long-term penicillin to individuals who have a history of ARF or RHD (secondary prevention), and medical

and surgical treatment (tertiary prevention) of patients with complications of RHD.[2] However, these prevention programmes/interventions are not well implemented in many low/middle-income countries due to severe human resource shortages, particularly for chronic non-communicable diseases like RHD.

A widely proposed solution to health workforce shortages is task sharing, sometimes called task shifting. Task shifting refers to the redistribution of tasks among health workforce teams, often from a few, highly trained health providers to a larger contingent of providers with less formal healthcare training.[10] Task sharing is allowing a wider range of cadres to offer certain services when this can be done safely and effectively. As such, task sharing is a means of rapidly expanding access and improving healthcare.[11] Task shifting and/or sharing have already been implemented in a number of countries with health workforce crises. Examples of HIV task shifting include provision of Anti-retrovirals (ARVs) by nurses and midwives and HIV testing and counselling by lay health workers (LHWs). (In this review, we will use task sharing to imply both task-shifting and sharing activities.)

There is evidence that task sharing has made a positive contribution to other disease programmes like HIV/AIDS, family planning and overall health systems strengthening.[12] While there is a paucity of evidence on the task sharing to address RHD, the use of task sharing in principle could be applied to this condition, for example, through the effective use of LHWs to support chronic disease management.[13] Our systematic review aims to provide contemporary information on models of care that use non-physician workers to expand access to care and/or improve the quality of care for strep throat, ARF and RHD.

OBJECTIVE
To investigate the effectiveness of task sharing in the prevention, diagnosis and management of RHD.

METHODS
Criteria for considering studies for this review
The protocol was prepared according to the Preferred Reporting Items for Systematic review and Meta-Analysis (PRISMA) guidelines. A PRISMA Protocol checklist is completed and included in the online supplementary appendix 1.[14]

Types of studies
Randomised controlled trials, cluster randomised controlled trials, quasi-experimental studies, controlled before and after studies and case reports.

Types of participants
For studies where the unit of analysis is the patient, we will include studies where participants are at risk of, or affected by strep throat, ARF and RHD. For studies where the unit of analysis if the healthcare worker, we will include studies where participants are tasked with providing care for strep throat, ARF and RHD.

Interventions
We define 'interventions' as any measures that seek to share/shift any tasks related to RHD prevention or management in healthcare facilities or relevant community settings (such as schools).

Controls
We define 'controls' as the standard(s) of care relevant to the clinical scenario. Usually, this will be a specialist or generalist physician, though in some cases (such as sore throat treatment) the standard may be a clinical officer or primary care nurse.

Types of outcome measures
We will assess study outcomes using a logic model framework applied to the three major levels of RHD care: primary, secondary and tertiary prevention (table 1). The use of logic models is appropriate in the evaluation of health system interventions where long-term health impact of an intervention can be difficult to quantify and processes (and intermediate outcomes) are important from a policy and planning standpoint. In advance of conducting the review, we do not have sufficient detail on the types of outputs, outcomes and impacts that studies report. Examples of study outcomes are listed in table 1 below.

Searches
A comprehensive search strategy will be developed to search both published and unpublished articles, with restrictions to English language but no restriction on the publication date. We will include Medical Subject Headings and free-text terms relating to RHD and various strategies of task sharing/shifting, such as training of

Table 1 Matrix of potential outcomes

Prevention levels	Example output	Example outcome	Example impact
Primary	Number of tests for group A streptococcus performed	Time spent per patient visit for sore throat	Number of cases of strep throat effectively treated (cured)
Secondary	Number of nurses trained in safe penicillin administration	Proportion of months (or patients) adherent to secondary prevention	Number of ARF recurrences (per individual or in population)
Tertiary	Number of referrals for RHD placed	Time in therapeutic range (international normalised ratio) for warfarin	Number (or rate) of hospital admissions for RHD complications

ARF, acute rheumatic fever; RHD, rheumatic heart disease.

healthcare workers in low/middle-income countries (table 2). The developed search strategy will be adapted to suit each individual database using applicable controlled vocabulary. We will screen the following electronic databases: PubMed, Cochrane Central Register of Controlled Trials, Scopus, Web of Science and Cumulative Index to Nursing and Allied Health Literature.

In addition, we will search for conference proceedings from XIX Lancefield International Symposium on Streptococci and Streptococcal disease. Google Scholar and the WHO Library Information System website will be searched for grey literature. We will hand-search reference lists of the key articles retrieved during the search.

Selection of studies for inclusion

Two authors will independently screen the search outputs (titles and abstracts) to select potentially eligible studies, and then review the full text of potentially eligible studies. A third author will resolve discrepancies. We will use a PRISMA flow chart to summarise the search and selection of studies for the review. We will include a table of all included studies in the review and document the reasons for exclusion of studies.

Data extraction and management

We will use a standardised/adapted data extraction form to independently extract information from included articles. This data extraction process will be duplicated independently in order to improve reliability. The data extraction form will capture (1) basic study characteristics, including objectives, study population, sample size, years and location of study and study design; (2) details of intervention(s) and study outcomes (organised according to the matrix in table 1) and (3) an open-ended section for other important quanitative findings (such as reductions healthcare costs) and qualitative findings (such as patient satisfaction) (online supplementary appendix 2). Where study data are unclear, the original author of the manuscript will be contacted to clarify his or her findings.

Assessment of risk of bias in included studies

All selected studies will be critically appraised in terms of their design methodology, biases and confounders. Cochrane Collaboration tool (ROB 2.0) will be used to assess the risk of bias of randomised control trial studies. Risk of Bias tool consist of five standard criteria: bias arising from the randomisation process, bias due to deviations from intended interventions, bias due to missing outcome data, bias in measurement of the outcome and bias in selection of the reported result.[15] The other study designs will be assessed using the Critical Appraisal Skills Programme checklist.[16] For each included study, we will report our assessment of risk of bias together with a descriptive summary of the information that influenced our judgement. We will judge the 'Risk of Bias' in an included study as either 'low risk', 'high risk' or 'unclear risk'. We will present a 'Risk of bias' figure to summarise these assessments. Two authors will resolve disagreements in the assessment of risk of bias by discussion and consensus, consulting a third reviewer to resolve any persistent disagreements.

Dealing with missing data

Corresponding authors of included studies will be contacted for missing data when necessary. Failing to get a response from the corresponding author, other authors will be contacted copying the corresponding author. Sensitivity analyses will be performed to assess the extent to which missing data could affect the primary outcome.

Assessment of heterogeneity

If studies of similar interventions reporting similar outcomes are included, statistical heterogeneity will be examined using the χ^2 test for homogeneity (with significance defined at 10% alpha level). Statistical heterogeneity will be quantified using the I^2 statistic.[15]

Data synthesis

The outcomes of interest will be either dichotomous or continuous; we will calculate risk ratios and their corresponding 95% CI and P values for dichotomous outcomes, and mean differences and SD for continuous outcomes. Where outcomes are measured using different scales, we will calculate standardised mean differences. If studies are sufficiently homogenous (relating to study populations, interventions and outcomes), then data will be pooled across studies and estimated summary effect sizes will be computed using random effects models. If meta-analysis is not feasible, the findings will be presented in narrative form, organised in matrices similar to table 1. The study summary will include relevant tables and figures to aid in data presentation.

Table 2	Example search strategy (PubMed)
Subject	**Search terms**
Task shifting	(task shift*(tiab) OR task-sharing *(tiab) OR balance of care(tiab) OR non-physician clinician*(tiab) OR nonphysician clinician*(tiab) OR task sharing(tiab) OR community care giver*(tiab) OR community healthcare provider*(tiab) OR cadres(tiab) OR 'Community Health Workers'(Mesh))
GAS, RHD and ARF	(('Pharyngitis'(MeSH) OR pharyngitis OR sore throat OR strep OR group a β-hemolytic streptococcal OR 'streptococcus pyogenes'(MeSH) OR group a streptococcus OR group a streptococcal infection OR 'impetigo' (MeSH) OR impetigo OR group a streptococcus skin infection OR rheumatic fever OR 'rheumatic fever' (MeSH) OR rheumatic heart disease OR 'rheumatic heart disease' (MeSH)))

ARF, acute rheumatic fever; GAS, Group A streptococcus; MeSH, Medical Subject Headings; RHD, rheumatic heart disease.

Subgroup analysis

Subgroup analyses may be conducted if possible, taking into account but not limited to: types of healthcare workers, study design, level of prevention and study setting (world region or country income level).

Sensitivity analysis

If studies are similar enough to justify meta-analysis, sensitivity analyses will be conducted as appropriate to check the robustness of the results.

Grading the quality of evidence

The Grading of Recommendations Assessment, Development and Evaluation (GRADE) approach will be used to assess the quality of evidence related to each of the primary outcomes. The GRADE approach will assess the quality of evidence as very low, low moderate or high, with implications on how confident we can rely on the results and if further research is likely to change the results.

Assessment of reporting biases

We will search for and include relevant unpublished studies to reduce possible publication bias. In addition, publication bias will be assessed using symmetry of funnel plots if 10 or more eligible studies are identified.

DISCUSSION

We anticipate that this review will not only be useful in giving evidence on the expanding access to care and/or improve the quality of care for strep throat, ARF and RHD but also it will inform the policy-maker on the role and potential impact of task sharing. A task sharing policy will promote rational redistribution of tasks among existing health workforce cadres. It will allow moving specific tasks, where appropriate, from highly qualified health workers to health workers with shorter training and fewer qualifications in order to make more efficient use of the available health workers and to improve access to services. We hope that lessons for successful implementation in different contexts will also be identified.

Reporting of this review

The eligibility criteria of studies and the selection process of relevant articles will be summarised as flow diagrams. This systematic review will be reported according to the PRISMA guidelines.[14]

ETHICS AND COMMUNICATION

No formal ethical review is required, as the systematic reviews will use publicly available data. The findings of this systematic review will be broadly disseminated via conference presentations, multidisciplinary workshops and peer-reviewed publications.

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