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Effectiveness of health care provider-led health education to the public on preventive measures for streptococcal infections and the risk of rheumatic fever and heart disease: A Systematic Review



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1 Introduction

Rheumatic heart disease (RHD) and acute rheumatic fever (ARF) remain a public health concern in low and middle-income countries (LMIC) ¹. Previous campaigns incorporating educational components focusing on primary and secondary prevention strategies have demonstrated success at reducing the burden of ARF and RHD ².

2 Aim

To synthesize, from published studies, evidence for the effectiveness of Health Care Worker (HCW)-delivered health education for increasing knowledge and use of health services amongst the public, in order to prevent ARF and RHD in areas of high prevalence

3 Method

We searched PubMed, the Cochrane Library, and SCOPUS. Study selection and data extraction were done in duplicate. We assessed bias with Cochrane's risk of bias tool for cluster-randomized trials (ROB 2.0 CRT) and the ROBINS -I tool for non-randomised studies. We synthesized results narratively. The GRADE method was used to assess overall certainty of evidence.

4 Results

4 Results, cont'

Four studies identified from 1022 potentially eligible articles were included in this review (one cluster RCT (n = 3,101 participants), two controlled before-after studies (n = 460) and a prospective cohort study (n = 436) from New Zealand, Brazil and India. See included table for study details.

Regarding increasing knowledge:

RCT: Nurse-led education compared to tablet-based learning interventions about ARF and RHD probably results in a similar increase in ARF/RHD knowledge (increase from baseline in mean scores of 23.5% and 23.9%, respectively), moderate certainty evidence, n = 1301 participants, 1 trial (Oliveira et al., 2020).

Non-randomised studies: HCW-led educational interventions compared to no educational intervention may result in an increased knowledge on GAS/ARF/RHD. Very low certainty evidence, n = 696 participants, 2 studies (Iyengar et al., 1992; Harre N et al., 2000).

Regarding uptake of health services:

RCT : HCW-led interventions compared to no educational intervention about ARF and RHD may result in an increased uptake of primary prevention services. Change from baseline, RR = 9.99 [95% CI 7.29-13.67]. That is, 31 more people attend health services per 1000 who receive education [95% CI 22 – 44], very low certainty of evidence, one study, n = 23,610, 1 trial (Mardani et al., 2011).

5 Conclusions

We found that educational interventions, whether nurse-led or through tablet-based learning probably results in increased knowledge and may lead to increased utilisation of health services. However, more studies are need, given the few studies available, with several limitations. As such, there remains substantial uncertainty to answer this review's objectives. We recommend that the findings are interpreted considering its limitations.

6 Acknowledgements

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7 References

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2. Nordet P, Lopez R, Duenas A, Sarmiento L. Prevention and control of rheumatic fever and rheumatic heart disease: the Cuban experience . Cardiovascular Journal of Africa. 2008;19(3):135–40.

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Table of included studies (n=4)

Study ID	Region, Country	Study design	Study aims	Participants	Study intervention	HCW-led health education component for the public	Health education focus	Comparison group
Harre 2000	South Auckland, New Zealand	CBA 4 weeks	To examine the effectiveness of three modes of communication designed to increase high school students' knowledge about throat infections and ARF in a high risk area.	Secondary school students (aged between 12 and 18 years)	The School-based Prevention of Rheumatic Fever Project: The intervention schools received three types of sore throat/ARF health education: assemblies run by nurses, lesson plans delivered by life orientation teachers and two-page take-home information sheets.	Assemblies in year level groupings were conducted by experienced public health nurses and community workers.	GAS and ARF, focusing on primary prevention	Students in a secondary school chosen in a different area of Auckland with a similar demographic profile. These participants had no access to a sore throat clinic and received no health education around sore throats or ARF.
Iyengar 1992	Haryand State, North India	Cohort 1 year	To evaluate awareness generated in ARF/RHD by training health workers, teachers and pupils.	Health workers, school teachers and pupils	A training programme initiated by a HCW (medical officer and first author SDI). This involved the training of other HCW's, a field worker, teachers and pupils.	The initial person to be trained was a field worker who then subsequently trained teachers. The teachers then trained pupils.	ARF, focusing on secondary prevention	A non-contiguous block in the same district of similar demographic and socio-economic profile. This population was given no health education.
Mardani 2011	Hawke's Bay, New Zealand	CBA 1 year	To determine whether health promotion activities increased sore throat swabbing rates among Flaxmere (Hawke's Bay, New Zealand)	Children aged 5–14 years, and in particular among Maori and Pacific children.	Rheumatic fever primary prevention strategies: a composite intervention including Flaxmere-specific pamphlets at the Flaxmere Family Festival, commentary of ARF sent to all Hawke's Bay general practitioners and distribution of pamphlets to the Flaxmere school community following every notification of ARF in a school student.	An information stall manned by public health staff at the Flaxmere Family Fun Day which had an estimated 200 people visit the stall. No mention of whether these were only people from Flaxmere.	GAS and ARF, focusing on primary prevention	The non-Flaxmere population of Hawke's Bay. Did not receive HCW-led intervention.
Oliveira 2020	Belo Horizonte, Southeast Brazil	RCT 6 months	To evaluate the effectiveness of education on RHD in schools, comparing the conventional expository teaching method with tablet-based worked examples.	School students in elementary and high school	Two different health education styles were used to cover topics of pharyngitis, ARF and RHD, with appropriate language for the age groups involved: conventional (expository classes with structured slide presentation, taught by the same research nurse who conducted the pilot study) and experimental (worked examples provided in individual interactive modules for mobile tablet devices).	Expository classes with structured slide presentation, taught by a research nurse. This was the control arm of study, but used as the intervention for the purpose of this review.	GAS, ARF and RHD	Worked examples provided in individual interactive modules for mobile tablet devices was used as the control for the purpose of this review.