

WORLD CONGRESS ON RHEUMATIC HEART DISEASE

2-4 November 2023 • Abu Dhabi



Submission Id: 221

Title: Health care provider-led education to prevent streptococcal infections and the risk of rheumatic heart disease: A Systematic Review

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Background & Aims: Group A Streptococcal (GAS) infection (skin or pharynx) precedes development of acute rheumatic fever (ARF) and rheumatic heart disease (RHD). ARF/RHD remains a public health concern in lower to middle income countries, despite the availability of antibiotics for primary and secondary prevention of these conditions. Campaigns, incorporating educational components, have shown promise in reducing the burden of ARF; however, the evidence is not clear. We aimed to evaluate the effectiveness of healthcare worker (HCW) delivered health education for increasing knowledge and use of health services amongst the public, to prevent ARF/RHD in high-prevalence settings.

Methods: We conducted a comprehensive electronic search in PubMed, Cochrane Library and Scopus databases using key terms. We used the Cochrane risk of bias tool for cluster-randomized trials (ROB 2.0 CRT) and the ROBINS-I tool for non-randomised studies to assess the methodological quality of included studies. Procedures were conducted in duplicate by two independent reviewers, with disagreements resolved through consensus or discussion with a third reviewer. We synthesised results narratively. We used GRADE methods to assess the overall certainty of evidence. Prospero registration no.: CRD42023391648

Results: Four studies identified from 1106 potentially eligible articles were included in this review (one cluster RCT from Brazil (n = 1, 301 participants)), two controlled before-after studies (n = 23, 890) from New Zealand, and a prospective cohort study (n = 436) from India.

Knowledge: nurse-led education probably results in a similar increase in ARF/RHD knowledge compared to a tablet-based learning intervention about ARF and RHD (increase from baseline in mean scores of 23.5% and 23.9%, respectively), moderate certainty evidence, n = 1301 participants, 1 RCT (Oliveira et al., 2020). From two observational 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 evaluated (Iyengar et al., 1992; Harre N et al., 2000).

Uptake of health services: 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 = 23610 (Mardani et al., 2011).

Conclusions: HCW-led 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, there are few studies, and those available have several limitations. As such, there remains substantial uncertainty with ongoing need to conduct appropriately designed studies.

Acknowledging the funding of the World Health Organization.