

Cost consequence analysis of facility-based lay health worker intervention to improve hypertension management in rural South Africa

Abstract

Introduction

In the year 2011, the South African government introduced the Integrated Chronic Disease model (ICDM) as one of the primary healthcare reforms. The model aimed to improve operational efficiency in primary healthcare facilities and to improve health outcomes for patients living with chronic communicable and non-communicable diseases (NCDs), achieved through reduction of patient waiting times and patient load. However, as this was a nurse-led initiative, this meant that nurses had to take on additional tasks like scheduling appointments, defaulter tracing and prepacking medications for patients. Resultantly, due to the shortage of health care personnel in facilities, nurses struggled to handle the additional workload which then affected quality of health care.

Healthcare personnel shortages continue to be a global health systems problem. In South Africa alone, the physician density ratio in 2017 was estimated at 0.91 per 1000 population while nursing and midwifery personnel ratio were 3.51 per 1000 population. This in turn affected public health care facilities especially rural primary health facilities causing increased waiting times, poor chronic disease management and decreased clinic attendance.

As part of reorientation of services to support the Integrated Chronic Disease Model (ICDM), the Nkateko trial implemented a lay health worker intervention, in rural Mpumalanga. The trial was a task shifting intervention which aimed to improve hypertension health outcomes, in rural Mpumalanga. Tasks were shifted from nurses to lay health workers (re-organisation of health services). The trial had a process evaluation which sought to understand the impact of the use of lay health workers on integrated chronic care for patients with hypertension and how the use of such a cadre of workers

would modify patient outcomes. This paper reports on the study that assessed the cost and consequences associated with using lay health workers to improve management of hypertension in rural South Africa within the Nkateko Randomized Controlled Trial (RCT).

Methods

Costs associated with deploying lay health care workers in the Nkateko trial were prospectively recorded, including costs of training. An activity-based approach also called the ingredients-based approach was used to select cost data to include in the analysis. Costs were categorised into capital and recurrent costs. Expenditure data, collected between the years 2014 to 2015 during the RCT, was used as the primary source of cost data. The cost analysis was performed from a health provider perspective using South African Rands (R). Final costs were presented in 2015 prices.

Due to the different outcomes assessed in the primary study, a cost consequence analysis was chosen as the method of economic evaluation. Typically, a cost-consequence analysis (CCA) calculates and presents estimates of resource use alongside the benefits (clinical or financial) as separate domains. The benefits (intermediate health outcomes) presented in this CCA were derived from the primary study and include clinic attendance and waiting times. A traditional literature search (not a systematic review) was conducted to understand the potential financial and health consequences of improving hypertension outcomes, using recent research papers and publications from the period 2013 to 2020. These were presented on a cost-consequence table.

Results

The study showed that to roll-out the intervention it cost R1 308 605 (\$102 459) (in two years) across four clinics. There were no significant differences in the total cost of intervention across all four intervention clinics. However, the cost per person per health facility ranged from R3.59 to R12,66 (which was almost triple the cost where patients who attended clinics were fewer). Timber clinic had the highest cost whilst the other three clinics were almost the same. This was due to the reduction in

patient numbers in Timber. Total capital costs for the period of 2 years in the intervention amounted to R17 770(\$1 391). This makes up about 1.4% of the total intervention costs. Recurrent costs made up 87.9% (R1 148 555) of the total intervention costs. The lay health worker intervention showed an improvement in clinic attendance and improvement attendance on scheduled dates. Part of the descriptive and financial consequences includes increased hypertension awareness, and potential costs (R2.5 – R4.2million) saved on stroke treatment in the Mpumalanga region, respectively.

Conclusion

This study estimated the costs associated with the use of lay health workers in the context of the Nkateko trial. The study showed that using lay health workers offers a potentially promising low-cost means to intervene to significantly reduce waiting times at health facilities and to improve intermediate health outcomes in patients with hypertension. Future research should explore the relationship between intermediate health outcomes reported in this study and final health outcomes (e.g. stroke prevention) through, potentially, modelling techniques.