

**A systematic review of the training of health care  
workers within essential medicines supply programs in  
developing countries**

**Moses Kioko Mutie**

**A thesis submitted in partial fulfillment of the requirements for the Degree of  
Master of Pharmacy, Research**

**University of Canberra**

**November 2011**

## **Abstract**

### **Background**

Deficiencies in Health Care Worker performance in developing countries are due to a variety of causes. These include for instance lack of health resources, low skill, undefined work processes. Regardless of the cause of poor Health Care Worker performance, the traditional solution has been to provide training. Consequently, many health training programs are conducted. These include the training activities within Essential Medicines supply programs. The training programs employ variety of approaches and methods. Developed on developed country models, the methods and approaches are often program depended. Incidentally, there is growing evidence that these resource-intensive training programs are not always effective. The evidence for the training effectiveness and sustainability appears weak or lacking. Therefore; demand is growing for other interventions that might help improve Health Care Workers' performance more efficiently and cost-effectively.

### **Objectives**

To investigate the effectiveness of training Health Care Workers within Essential Medicines supply programs in developing countries. this research will focus on pharmaceutical and clinical care practices at the Primary Health Care level in selected developing country regions, the impact of training will be explored. Specifically, the factors affecting the training program sustainability will be examined.

### **Search strategy**

Using a pre-defined search protocol, the Cochrane Library was initially searched for existing reviews including reviews currently being undertaken in this area of research. The search was limited from 1990 to 2010 time period. The search activity was extended to MEDLINE, PubMed and Cinahl indexing databases. Scopus and Web of Science citation databases were also searched for a comprehensive location of relevant studies. Google Scholar and organisational websites

were searched for relevant published and non published literature. Finally, reference lists of retrieved articles were checked for additional articles relevant to the study topic.

### **Selection criteria**

Trials eligible for inclusion in the review included cluster randomised controlled trials, randomised controlled trials employing various randomisation methods. In addition, intervention studies that objectively measured medicine use practices or health outcomes by Health Care Workers were eligible for inclusion.

### **Data collection and analysis**

Using a pre-determined study inclusion criterion, relevant studies that qualified on all inclusion criteria were selected for review. Data from full articles was extracted using a standardised form and assessed for study quality. A meta-study was not a primary objective of this study and was not appropriate.

### **Results**

Twelve randomised controlled studies met inclusion criteria. These employed varied randomisation procedures. Three studies focused on training in pharmacy supervised sites including untrained medicine retailer shops. The other eight studies focused on training interventions with clinical care workers. All studies focused on health services within primary care settings.

### **Conclusion**

The result of the twelve reviewed studies showed training activities delivered in repeat sessions leads to improvements in Health Care Workers' performance. This study found evidence that training is better than no training and the knowledge from one training program may be transferable to other programs and work sites. However, because of the small number of studies,

differences in training methods, and weaknesses in study designs, it was not possible to conclude that in general, training improves Health Care Workers' performance in primary care settings. Consequently, well designed trials are therefore needed to provide strong reliable evidence on what these training programs achieve. To guide policy decisions regarding which training intervention to invest in, such studies should also include data on resources and cost-effectiveness of training interventions

## **Presentations and Publications**

The work embodied in this thesis has been presented on a number of occasions and is being prepared for journal publication.

### **Presentations**

- i. Systematic Review Methodology in Public Health research (oral presentation)

Mutie, M. and Cooper, G.

Confirmation of enrolment initial Seminar, University of Canberra. June 2009.

- ii. Education and training of pharmacy assistants across the developing countries (Poster Presentation)

Mutie, M. Cooper, G. and Brown, A.

APSA Conference, Hobart, Australia Dec 2009.

### **Papers in preparation**

- i. Systematic review of the training of health care workers within Essential Medicines supply programs in developing countries.

(Under revision)

Mutie, M., Cooper G. and Davey, R.

- ii. Effects of new technologies on chronic disease management in developing countries.

Mutie, M., Cooper, G. Davey, R. and Mandal, S.

(In preparation, targeting for publication in Southern Medical Review)

## **Acknowledgements**

I wish to thank the chair of my supervisory panel Professor Gabrielle Cooper for her patience, understanding and encouragement. There are many times I turned up to you for emotional encouragement and direction. You helped me see the 'bigger' picture and strive to produce my best. I was inspired by your energy, drive and passion for research that has an infectious quality. We also had some fun times together 'working' through Sea food at Salamanca, Hobart. Thanks for the once in a lifetime opportunity.

I wish to thank Professor Rachel Davey for her invaluable assistance in the final stages of writing this thesis. Her agreement to become a supervisor of my thesis, considering Pharmacy is not her area of specialty, is greatly appreciated.

Special thanks go to Pat Tandy, the Faculty of Health Librarian, who became my lifeline to other researchers in my study area.

Finally but most importantly I thank my kind and patient wife Doris, and children, Laura, Ivy and Karyn for loving me through this thesis. Thanks a lot for believing in me and reminding me to take breaks, relax and have fun.

## TABLE OF CONTENTS

ABSTRACT .....	3
CERTIFICATE OF AUTHORSHIP OF THESIS .....	7
PRESENTATIONS AND PUBLICATIONS .....	9
ACKNOWLEDGEMENTS .....	11
LIST OF ABBREVIATIONS.....	19
<b><u>CHAPTER 1 INTRODUCTION .....</u></b>	<b><u>21</u></b>
1.1 THESIS OVERVIEW .....	21
1.2 DEFINITION OF TERMS .....	21
1.3 BACKGROUND TO THE STUDY .....	22
1.4 AIM OF THE STUDY .....	23
1.5 RESEARCH QUESTION .....	24
1.6 SUMMARY .....	25
<b><u>CHAPTER 2 BACKGROUND.....</u></b>	<b><u>27</u></b>
2.1 INTRODUCTION.....	27
2.2 PART A: THE ESSENTIAL MEDICINES LISTS.....	28
2.2.1 HISTORICAL DEVELOPMENT .....	28
2.2.2. SELECTION PROCESS FOR INCLUSION IN NATIONAL ESSENTIAL MEDICINES LIST.....	29
2.2.3. ADVANTAGES OF LIMITED LISTS OF MEDICINES .....	29
2.2.4. THE WHO MODEL LIST OF ESSENTIAL MEDICINES .....	30
2.3. PART B. ESSENTIAL MEDICINES IN PRIMARY HEALTH CARE .....	31
2.3.1. ESSENTIAL MEDICINES SUPPLY PROGRAMS IN DEVELOPING COUNTRIES.....	32
2.3.2. SKILL AND COMPETENCE .....	32
2.3.3. MEDICINES ACCESS GAP .....	33

2.3.4. AFFORDABILITY ISSUES .....	34
2.4 STRATEGIES USED FOR QUALITY HEALTH OUTCOMES IN DEVELOPING COUNTRIES.....	35
2.5. JUSTIFICATION OF THIS RESEARCH.....	36
2.6 ASSUMPTIONS .....	37
2.7. SUMMARY .....	37

**CHAPTER 3 METHODOLOGY .....39**

3.1. INTRODUCTION .....	39
3.2. SYSTEMATIC REVIEW DEFINITION .....	39
3.3. WHY ARE SYSTEMATIC REVIEWS NEEDED?.....	39
3.4. THE REVIEW PROTOCOL.....	40
3.5. RELIABILITY AND VALIDITY .....	40
3.6. CRITICAL APPRAISAL .....	41
3.7. DATA COLLECTION AND ANALYSIS .....	43
3.8. META-SYNTHESIS VERSUS META-ANALYSIS.....	44
3.9. SUMMARY .....	44

**CHAPTER 4 METHODS .....45**

4.1. INTRODUCTION .....	45
4.2. OBJECTIVE.....	45
4.3. CRITERIA FOR CONSIDERING STUDIES FOR REVIEW .....	46
4.4. SEARCH STRATEGY AND IDENTIFICATION OF STUDIES .....	46
4.5. PRE-DETERMINED CRITERIA FOR INCLUDING STUDIES IN THE REVIEW .....	49
4.6. EXCLUSION.....	49
4.7. STUDY SELECTION PROCESS AND ASSESSMENT FOR QUALITY .....	50
4.8. SUMMARY .....	51



**CHAPTER 5 . RESULTS.....53**

5.1. OVERVIEW OF SEARCH RESULTS .....53

5.2. OVERVIEW OF THE STUDIES INCLUDED FOR REVIEW .....55

5.3. GROUP A STUDIES: PHARMACISTS AND UNTRAINED MEDICINE RETAILERS.....55

5.3.1. ROSS-DEGNAN ET AL, CONDUCTED IN INDONESIA AND KENYA, PUBLISHED 1996.....55

5.3.2. CHALKER ET AL, CONDUCTED IN VIETNAM AND THAILAND, PUBLISHED 2005 .....57

5.3.3. ABUYA ET AL, CONDUCTED IN KENYA, PUBLISHED 2009.....58

5.4. GROUP B STUDIES: CLINICAL HEALTH CARE WORKERS .....59

5.4.1. ANGUNAWELA ET AL, CONDUCTED IN SRI LANKA, PUBLISHED 1991 .....60

5.4.2. BEXEL ET AL, CONDUCTED IN ZAMBIA, PUBLISHED 1996 .....61

5.4.3. SANTOSO STUDY, CONDUCTED IN INDONESIA, PUBLISHED 1996.....62

5.4.4. TRAP ET AL, CONDUCTED IN ZIMBABWE, PUBLISHED 2001 .....63

5.4.5. MOHAN ET AL, CONDUCTED IN INDIA, PUBLISHED 2007 .....64

5.4.5. FAIRHALL ET AL, CONDUCTED IN SOUTH AFRICA, PUBLISHED 2005 .....65

5.4.6. QURESHI ET AL, CONDUCTED IN PAKISTAN, PUBLISHED 2007.....66

5.4.7. REYNOLDS ET AL CONDUCTED IN KENYA, PUBLISHED 2007.....66

5.4.8. ARIFEEN ET AL, CONDUCTED IN BANGLADESH, PUBLISHED 2009 .....67

5.5. SUMMARY .....68

**CHAPTER 6 . DISCUSSION.....69**

6.1. INTRODUCTION .....69

6.2. GENERAL COMMENTS .....69

6.2.1. OVERVIEW OF STUDY QUALITY.....69

6.2.2. TRAINING INTERVENTIONS .....70

6.2.3. TRAINING METHODS .....71

6.2.4. TRAINING CHARACTERISTICS.....71

6.2.5. GROUP TRAINING.....71

6.2.6. SUPERVISION, AUDIT AND FEEDBACK .....71

6.2.7. COMMUNITY CASE MANAGEMENT .....72

6.3. WHAT HAS FAILED?.....72

6.4. LIMITATIONS IN THIS REVIEW .....	73
6.4.1. EXPERTS IN THE FIELD .....	73
6.4.2. LIMITED NUMBER OF STUDIES.....	73
6.4.3. INCONSISTENCY IN REPORTING.....	73
6.4.4. PUBLICATION BIAS.....	74
6.4.5. METHODOLOGICAL BIAS.....	74
6.4.6. COMPARATIVE STUDIES .....	74
6.5 GAPS IN KNOWLEDGE .....	75
6.5.1. HEALTH SETTING AND CONTEXT.....	75
6.5.2. COMMUNICATION BY HEALTH CARE WORKER.....	75
6.5.3. PHARMACIES AND UNTRAINED MEDICINE SELLERS .....	76
6.5.4. COMPARATIVE COST-EFFECTIVENESS .....	76
6.6. SUMMARY .....	76
<b><u>CHAPTER 7 RECOMMENDATIONS .....</u></b>	<b><u>77</u></b>

7.1 RECOMMENDATION 1-TRAINING PRINCIPLES.....	77
7.2. RECOMMENDATION 2-CO-ORDINATION FOR CAPACITY BUILDING .....	77
7.2.1. RECOMMENDATION 3-TRAINING TO IMPROVE COMMODITY SUPPLY.....	78
7.2.3. RECOMMENDATION 4-COMPETENCY BASED TRAINING.....	79
7.3. RECOMMENDATION 5-TRAINING EXPANSION .....	79
7.3.1. RECOMMENDATION 6-IMPROVED COMMUNICATION.....	80
7.3.2. RECOMMENDATION 7-IMPROVED REPORTING.....	80
7.3.3. RECOMMENDATION 8-TRAINING ASSESSMENT .....	80
7.3.4. RECOMMENDATION 9-TRAINING TO MEET PRIMARY HEALTH CARE GOALS .....	81
7. RECOMMENDATION 10-HEALTH CADRE SPECIFIC TRAINING.....	81
7.5. RECOMMENDATION 10 ESSENTIAL MEDICINES CONCEPT AS TRAINING THEME .....	82
7.6. RECOMMENDATION 11-ADOPTION OF THE CONSORT GUIDELINES .....	82
7.7. RECOMMENDATION 12-RESEARCH AND DEVELOPMENT .....	83
7.8. SUMMARY .....	85

REFERENCES .....	87
APPENDICES.....	94
APPENDIX A .....	95
APPENDIX B.....	99

**List of Figures**

Figure 1 Essential Medicines representation.....	30
Figure 2 Study selection process .....	51
Figure 3. Schematic representation of the study assessment and selection process .....	54

**List of Tables**

Table 1 Components of critical appraisal.....	43
Table 2 Databases and organisations searched in the review.....	48
Table 3 Study designs considered acceptable for inclusion .....	49
Table 4. Inclusion/exclusion criteria .....	53
Table 5.GRADE approach for levels of quality of evidence .....	69
Table 6.Factors that may decrease quality levels of evidence .....	70

## LIST OF ABBREVIATIONS

### **EM**

Essential Medicines

### **EML**

Essential Medicine List

### **NEML**

National Essential Medicine List

### **NHMRC**

National Health and Medical Research Council

### **HCW**

Health Care Worker

### **CHCW**

Community Health Care Worker

### **PHC**

Primary Health Care

### **WHO**

World Health Organisation

### **UNICEF**

The United Nations International Children's Fund

### **INRUD**

International Network for Rational Use of Drugs

### **ORS**

Oral Rehydration Salts

### **DAP**

Drug Action Program