UNICEF infant and young child feeding training in Zimbabwe: Analysis and Recommendations

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BSc Honours Nutrition

Dissertation submitted in fulfilment of the requirements for the degree *Magister Scientiae* in Nutrition at the Potchefstroom Campus of the North-West University

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November, 2014

Preface

The work included in this dissertation represents a passionate move to create a bridge between research and nutrition programming. It highlights the importance of continuously analysing programming efforts in order to be able to make well-informed decisions and take action. Broadly viewed, this work puts the great need for implementation research into perspective. Results of this work offer enlightenment on using the global UNICEF community infant and young child feeding training package.

Acknowledgements

I acknowledge the outstanding support I received from my research co-investigators. In particular I thank Dr Namukolo M. Covic for the support she provided through supervising this work. Many thanks go to the Nutricia Research Foundation for the generous funding they provided for this work. Many thanks goes to the various family support which I have received throughout the implementation of this work-life would not be what it is/has been without your support-***Love you all***! I acknowledge Mr Daniel Siro for his outstanding support. Lastly, I thank the National Nutrition Department of the Ministry of Health and Child Care, in particular Mrs Ancikaria Chigumira, for allowing the implementation of this research study.

Abstract

INTRODUCTION/BACKGROUND

UNICEF introduced a community infant and young child feeding (cIYCF) training and counselling package in 2010, which was implemented in Zimbabwe for community counsellors (CCs) in rural districts. The training package is generic for programming and capacity development on community-based IYCF counselling skills. The implementation includes a set of 15 pre/post-test questions on different aspects of IYCF practices. No analysis of the training pre- and post-tests for the package has been documented in literature. The main aim of the research was therefore to analyse training records on the training in Zimbabwe and identify specific IYCF practices that might require additional attention. The mini-dissertation presents recommendations for the Ministry of Health and Child Care/Welfare Zimbabwe for possible follow up.

METHODS

The study used a quasi-experimental design. We retrieved pre- and post-test training records on the 15 questions from 19 districts where training had been conducted from the Zimbabwe National Nutrition Department of the Ministry of Health and Child Care/Welfare. Fifteen districts were included for the educational material case-study experience presented in manuscript 1, while 13 districts satisfied the inclusion criteria for the in-depth analysis in manuscript 2. SPSS (version 17.1) was used to do a t-test mean comparison of the proportions of CCs giving correct responses before and after training. ANOVA was used to compare changes in proportions of correct responses from pre- to post-training by district and province. Post hoc analysis was done to determine where differences lay. A p value of < 0.05 was accepted for statistical significance. Graphical trends of proportions of CCs giving correct responses pre- and post-training for individual questions by district were generated and presented in manuscript 2.

RESULTS

The training package is valuable in taking IYCF training to community level. In manuscript 1, a total of 966 CCs evaluated the training. Ninety-one per cent of CCs evaluated all the training components on average as good, while 0.2% evaluated them as unsatisfactory. In manuscript 2, we used 88% of the retrieved data for analysis. ANOVA results of the percentage change in CCs giving correct responses pre- to post-test by district were not significant ($p>.05$) for all the questions except question 8 on milk production and the baby's suckling stimulus. The mean comparison t-test of proportions (pre- and post-test) was significant for all 15 questions ($p<.05$).

Three different trends were observed in the proportions of CCs giving correct responses to different questions.

CONCLUSION

Our results demonstrate the value of analysing the records of the pre- and post-training test training package to inform follow-up on aspects needing additional attention. The different trends in proportions of CCs giving correct responses have implications for the knowledge base on specific IYCF practices in the communities served by the CCs. We recommend analysis of similar training records where such training is planned or has taken place to inform the implementation process. For Zimbabwe we recommend follow-up of the CCs with training to address the issues raised in our findings.

Key terms: community, infant and young child feeding

Opsomming

INLEIDING/AGTERGROND

UNICEF het in 2010 ’n gemeenskapsgebaseerde opleidings- en voorligtingspakket oor die voeding van babas en jong kinders (gBJKV) bekendgestel en die opleiding is in Zimbabwe geïmplementeer vir gebruik deur gemeenskapsvoorligters (GV’s) in landelike gebiede. Die pakket is generies vir programmering en kapasiteitsontwikkeling van voorligtingsvaardighede vir gemeenskapsgebaseerde BJKV. Die implementering daarvan sluit ’n stel van 15 pre- en post-opleidingstoetsvrae in oor verskeie aspekte van BJKV-praktyke. Geen analise van die pre- en post-opleidingstoetse in die pakket is in die literatuur gedokumenteer nie. Die hoofdoelwit van die navorsing was dus om opleidingsrekords oor die Zimbabwiese opleiding te analiseer en spesifieke BJKV-praktyke wat addisionele aandag vereis, te bepaal. Die mini-verhandeling bied ook aanbevelings aan vir die Zimbabwiese Ministerie van Gesondheid and Kindersorg/-welstand vir moontlike opvolging.

METODE

Die studie het van ’n kwasi-eksperimentele ontwerp gebruik gemaak. Pre- en post-opleidingstoetsrekords van 19 distrikte wat opleiding ontvang het, is van die Zimbabwiese Nasionale Voedingsdepartement van die Ministerie van Gesondheid en Kindersorg/-welstand verkry. Vyftien distrikte is ingesluit in die gevallestudie wat gemik is op ondervinding met die opvoedingshulpmiddels, soos wat in manuskrip 1 aangebied word, terwyl 13 distrikte aan die in-diepte-analise se insluitingskriteria voldoen het, soos wat in artikel 2 aangebied word. SPSS (weergawe 17.1) is gebruik om ’n t-toets gemiddelde vergelyking te bepaal van die verhoudings van GV’s wat korrekte response voor en na opleiding behaal het. ANOVA is gebruik om veranderinge in verhoudings te bepaal tussen korrekte response pre- en post-opleiding volgens distrikte en provinsies. ’n P-waarde van $p<0.05$ toon statistiese betekenisvolheid aan. Grafiese tendense van verhoudings van GV’s wat korrekte response pre- en post-opleiding behaal het in individuele vrae volgens distrikte, is geskep en word in manuskrip 2 aangetoon.

RESULTATE

Die opleidingspakket is van waarde om BJKV-opleiding tot by gemeenskapsvlak te neem. In manuskrip 1 word aangetoon dat 966 GV’s die opleiding geëvalueer het. ’n Persentasie van 91% van die GV’s het al die opleidingskomponente as gemiddeld goed geëvalueer, terwyl 0.2% dit as onbevredigend geëvalueer het. In manuskrip 2 word aangetoon dat 88% van die verkrygde data vir analise gebruik is. Die ANOVA-persentasieverandering in GV’s wat korrekte response in toetse pre- en post-opleiding behaal het, was nie betekenisvol nie ($p>0.05$),

insluitend al die vrae, behalwe vraag 8 wat oor melkproduksie en die baba se suigstimulus gehandel het. Die t-toets gemiddelde vergelyking van die verhoudings (toetse pre- en post-opleiding) was betekenisvol vir al 15 vrae ($p<0.05$). Drie verskillende tendense is in die verhoudings van GV's wat korrekte response vir verskillende vrae behaal het, opgemerk.

GEVOLGTREKKING

Die resultate demonstreer die waarde wat analise van die pakket se toetsrekords pre- en post-opleiding inhou, om sodoende opvolg te bewerkstellig oor aspekte wat addisionele aandag vereis. Die verskillende tendense in die verhoudings van GV's wat korrekte response behaal het, hou implikasies in vir die kennisbasis van die GV's oor spesifieke BJKV-praktyke in die gemeenskappe. Die aanbeveling word gemaak dat analise van soortgelyke opleidingsrekords uitgevoer moet word waar soortgelyke opleiding beplan word of reeds plaasgevind het, om sodoende die implementeringsproses te bevorder. Verder word aanbeveel dat GV's in Zimbabwe opgevolg en opgelei word om die aspekte van belang wat in die bevindinge uitgelig is, te hanteer.

Sleutelwoorde: gemeenskap, baba- en jongkind-voeding

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Chapter 1 INTRODUCTION

1.1 Background and motivation

Community-based programmes have the potential of lowering world malnutrition, which contributes to approximately 60% of the 10.9 million deaths annually among children under the age of five years (WHO, 2003:5-25). The alarming factor is that only 35% of infants worldwide are exclusively breastfed for at least the first six months and complementary feeding is often begun too early or too late, with foods that are unsafe and nutritionally inadequate (WHO, 2003:5-25). To improve this current state in infant and young child feeding, community programming can be a pivotal entry point to influence traditional community practices in order to achieve optimal infant feeding. Community programming can ultimately lead to a reduction in the number of infant deaths and alleviate the long-term consequences of under-nutrition by using the 'critical window of opportunity', which is the time from pregnancy to two years of age (UNICEF, 2011:6). At community level, programming can be used to ensure adoption of best practices in communities. According to the World Bank, (2006) interventions that seek to improve infant and young child feeding practices for children younger than two years should be a global priority in seeking to eradicate infant and child under-nutrition.

The occurrence of malnutrition in Zimbabwe is high, as reflected in the prevalence of stunting (32%), and wasting (3%). However, there is much sub-national variation and some districts have reported stunting rates as high as 40% (Zimbabwe Statistical Office, 2010-2011). According to the Demographic Health Survey 2010-2011 (DHS), the percentages of infant and young child feeding (IYCF) practices were as follows: early breastfeeding initiation 69%, exclusive breastfeeding (EBF) rate at six months 31%, breastfeeding with complementary foods 6-9 months 80%, children still breastfeeding at 20-23 months 20% and EBF within one hour of birth 65%. All these IYCF-related rates clearly show that the country needs to make efforts to improve the current situation. Efforts to improve IYCF require investigation of the effectiveness of interventions seeking to improve IYCF caring practices.

Despite massive IYCF training efforts implemented since 1992 in the country, targeting health professionals, mostly through in-house training, optimum IYCF practices remain a challenge in Zimbabwe, especially in rural areas (Zimbabwe Statistical Office, 2010-2011). The year 2011 saw a new approach targeting capacitation of community counsellors (CCs) and village health workers (VHWs), but also some qualified nurses and community volunteers. By mid-2012, the country had managed to cover 14 of the 63 districts in the country. This amounted to more than 2000 CCs being trained and over 20 000 mother/infant pairs having accessed counselling services on a continual basis (one CC per 10 mother/infant pairs). Furthermore, women who are

receiving or have received counselling are expected to participate in supporting other mothers through peer support groups, with facilitation from a trained IYCF CC (Assefa, 2012:98). The training package comes with a set of 15 pre-and post-test questions, which assess the immediate effect of the training on IYCF knowledge from the specific areas reflected by the questions. Unfortunately, no studies have been published in Zimbabwe that have analysed the effect of this community IYCF (cIYCF) generic training programme on influencing IYCF knowledge of the trained CCs on IYCF. Unavailability of this information creates a problem evidenced in many community-based programmes, which focus on training CCs, in that there is failure to learn from current and other experiences (Lehmann & Saunders, 2007: 3-27). This does not allow for informed adaptation of CC training or engagement processes. In order to inform the current CC training process, it is necessary to analyse the immediate effect of the training on changing knowledge of the trainees on IYCF across the districts where training has taken place. This can be done by analysing the available pre-and post-test cIYCF records at each district and determining the change in knowledge that was observed to inform future implementation of the training programme and to serve as a point of comparison for future continued training activities.

The United Nations' Children's Fund (UNICEF) generic training package and planning/adaptation guide for cIYCF counselling is an initiative to bring IYCF practices to community level (UNICEF, 2011:83). The package is meant for in-service and initial training of cIYCF counsellors. It covers breastfeeding, complementary feeding, HIV and infant feeding (based on the 2010 World Health Organisation [WHO] guidelines), infant feeding in emergencies, maternal nutrition and severe acute malnutrition. These concepts are covered in the package, using interactive adult learning techniques suitable for people of low literacy and including the use of a set of 28 counselling cards. Ideally the five-day training uses a participatory problem-centred training methodology, using interactive presentations, buzz groups, matching games, brainstorming, presentations, group work, demonstrations, role play and observations. Field practice using counselling cards, visual aids and case studies also form an integral part of the training. Evaluation of the training is done through pre-and post-tests and an end-of-training evaluation.

The possible advantage of the UNICEF cIYCF training strategy is that, immediately after training, the trained counsellors are attached to real cases that they follow up, targeting pregnancy and early infancy.

This quasi-experimental implementation research study for the UNICEF cIYCF training package in Zimbabwe offers a general and an in-depth analysis of the training, with particular emphasis on knowledge scores from the pre- and post-test questions. An in-depth analysis of the

proportions giving correct responses to the pre- and post-test questions would also help to identify the areas of IYCF practices where additional attention would be needed. These would be where the lowest numbers of CCs would have given correct responses both before and after training. Recommendations are drawn from the analysis as a way to inform additional and/or future training activities.

1.2 Title

UNICEF infant and young child feeding training in Zimbabwe: Analysis and recommendations.

1.3 Problem statement

Optimum IYCF remains a challenge in Zimbabwe, as especially evidenced in the recent DHS results of 2010-2011. In 2010, after the release of the UNICEF training package, a new approach was realised in Zimbabwe, with the aim of capacitating CCs, specifically targeting VHWs, but also including some qualified nurses and community volunteers. By mid-2012, Zimbabwe had managed to cover 14 of the 63 districts in the country. This amounted to over 2000 CCs having been trained and over 20 000 mother/infant pairs having accessed counselling services on a continual basis (1CC: 10 mother/infant pairs). The UNICEF community IYCF package comes with a same-set of 15 pre- and post-test yes/no/l don't know questions. The questions are administered before and after the training. They are meant to test the CCs' knowledge on IYCF practices reflected in the question. Unfortunately, no studies have been published in Zimbabwe to analyse the effect of this cIYCF generic training programme on changing the IYCF knowledge of the trained CCs on IYCF. One way of analysing the training would be to analyse the available pre-and post-community IYCF records in each district and determine the change in knowledge that was observed, to inform future implementation of the training programme. In addition, it can serve as a point of comparison for future continued training activities.

1.4 Study design

This study was implementation research following a quasi-experimental design. Training records from training done from 2011 to 2013 were obtained from the National Nutrition Department of the Ministry of Health and Child Welfare/Care (MoHCW) of Zimbabwe. We used training sites in the districts where CCs had been trained as our sampling units. The inclusion criteria were the availability of pre- and post-test results records on the 15 pre-and post-test question responses for a site where training had taken place. For a district to be included there had to be a minimum of two training sites on which data was available. The study sample was from 82 sites/centres and 19 districts where training had been given.

1.5 Aims and objectives

The aim of this study is to describe the Zimbabwean experience of using the UNICEF IYCF training package and through an in-depth analysis of pre- and post-training results recommend its use in similar developing country settings.

The following objectives were set:

1. Describe the UNICEF IYCF practice training and counselling package as excellent training material for a specific section of the Journal of Nutrition Education and Behavior (JNEB), Great Educational Materials (GEMs).

2. Conduct in-depth analysis of the pre- and post-test score records for the cIYCF training of CCs in districts from June 2011.

3. Determine the proportions of the CCs that gave correct responses to the pre- and post-tests as a proxy indication of trends of knowledge on the related IYCF practices before and after the training.

4. Determine differences in trends of proportions giving correct responses by district and province, as well as by individual question.

5. Use the proportions of CCs giving correct responses on individual questions of the pre- and post-training tests to identify IYCF practices that may need additional attention in follow-up activities.

6. Assess how the trained counsellors evaluated the generic training package using end-of-training evaluations.

7. Make recommendations to the MoHCW Nutrition Department of Zimbabwe and other interested parties on possible future data-capturing methods/tools regarding the implementation of the training.

1.6 Methods used to address the aims and objectives

The UNICEF training package has a set of 15 questions related to specific IYCF practices, which is administered pre- and post-training. To address the aims and objectives, records of the pre- and post-tests of the community IYCF training done from 2011 to 2013 were retrieved from the MoHCW Zimbabwe National Nutrition Department archives. Microsoft Office Excel was used for the initial data capturing and coding of district training records. The records were for 19 districts, involving an average of 82 sites where CCs had been trained per district. Each training

site involved CCs and a few nurses and community health volunteers who were trained to be CCs. The unit of analysis was a training site and only those districts for which training records were available for at least two sites were included in the study. The results are presented in article 2. The proportion of CCs who gave correct responses to the pre- and post-test questions was determined. The changes in proportions from the yes/no/don't know correct responses were determined using a simple numeric difference, subtracting the post- from the pre-test proportion. The statistical package SPSS was used for statistical analysis. The proportions giving correct responses and the change in proportions giving correct responses from pre- to post-test were tested for normality and the data was normally distributed and warranted for parametric statistics. Analysis of variance (ANOVA) was used to determine possible differences among districts and provinces. Questions to which the proportions of correct responses were relatively low, both pre- and post-training, were used to identify IYCF practices where additional follow-up might be required and related recommendations were made accordingly. Frequencies were calculated from the end-of-training evaluations to assess how the trainees evaluated the training package components on a scale from good, average to unsatisfactory. Specific questions where low correct response scores were obtained were identified as a proxy indication of those feeding practices that needed some attention.

1.7 Research team and contribution

Table 1.1: List of research members and roles

Team Member	Institution	Roles
Mr Wisdom G. Dube	CEN, NWU,Potchefstroom, Campus, MoHCC Zimbabwe	Principal investigator and MSc student on the project, involved in research design, data collection, data capturing, data coding, data analysis, data interpretation and writing up.
Dr Namukolo M. Covic	CEN, NWU,Potchefstroom, Campus	Study supervisor for MSc student, academic guidance on research design, data analysis and interpretation, guidance in writing up.
Mr Tasiana K. Nyadzayo	MoHCC Zimbabwe	Co-investigator, guidance with sourcing of training records in Zimbabwe

Team Member	Institution	Roles
Mrs Thokozile Ncube	UNICEF, Zimbabwe	Co-investigator, guidance on processes involved with the training package and how it was rolled out in Zimbabwe.

CEN, Centre of Excellence for Nutrition, NWU, North-West University; MoHCC, Ministry of Health and Child Care Zimbabwe

Included is a statement from all the co-authors, confirming their role in the article and providing permission for the inclusion of the article/s as part of this dissertation.

I declare that I have approved the above-mentioned article/s, that my role in the study, as indicated above, is representative of my actual contribution and that I hereby give my consent that it be published as part of the M.Sc. dissertation of Mr Wisdom G . Dube

_____ _____ _____

Dr N.M Covic Mr T.K Nyadzayo Mrs T. Ncube

1.8 Other study contributors

We acknowledge the inputs and/or contribution of the following:

Christiane Rudert, UNICEF New York for the useful inputs received during the preparation of manuscript 1 for the JNEB.

Nutricia Research Foundation for awarding a fellowship to allow funding of the research.

1.9 Structure of the dissertation

The dissertation is presented in article format. Technical aspects of thesis writing and referencing, except for chapters 3 and 4, follow the postgraduate manual of the North-West University guidelines (Arial font, size 11 and NWU-Harvard referencing). In Chapter 3 the manuscript on 'UNICEF Training Package for scaling-up skilled community infant and young child feeding counsellors" follows the author guidelines provided by the JNEB for Great Educational Materials (GEMs) (Annexure 6); the reference style follows the American Medical Association Manual of Style, 10th edition. The Chapter 4 manuscript, "Community infant and young child feeding training implementation in rural Zimbabwe: Analysis and recommendations", follows the author guidelines provided by the Journal of Rural and Remote Health (Annexure 7) for original research and the referencing style is the Vancouver style.

Chronologically the dissertation beginnings with the current chapter as Chapter 1 and it is followed by Chapter 2, which is the literature review section, the articles (Chapters 3 and 4) and Chapter 5, which incorporates the overall conclusions and recommendations.

1.9.1 Chapter 1

In Chapter 1 an introduction to the dissertation is provided. The purpose is to provide the context of the research that was done and describe how the dissertation is structured. It also introduces the study team and their roles.

1.9.2 Chapter 2

In Chapter 2 a literature review is provided from the available literature on the subject of IYCF. An overview on the importance of IYCF, particularly appropriate breastfeeding and complementary feeding practices, is provided. In the literature review capacity development is presented and emphasis is placed on the IYCF situation in Zimbabwe. In the end, the indicators used for assessing IYCF at national level are highlighted.

1.9.3 Chapter 3

This chapter presents a manuscript that has been submitted and is in the review process with the JNEB under the GEMs section. The title of the manuscript is “UNICEF training package for scaling up skilled community IYCF counsellors”, which is currently in the second peer review stage. The aim of GEMS papers, as articulated by the JNEB (Annexure 6), is to give a brief description of a useful approach to nutrition education and behaviour covered in not more than four double pages. The aim of the educational material paper is to describe the Zimbabwean experience in using the UNICEF IYCF training package for increasing the numbers of skilled community IYCF counsellors and recommend its use in similar developing country settings.

1.9.4 Chapter 4

In Chapter 4 a manuscript planned for submission to the Journal of Remote and Rural Health is presented. The title of the manuscript is “Community infant and young child feeding training implementation in rural Zimbabwe: Analysis and recommendations”. The aim was to give an in-depth analysis of the pre- and post-test knowledge scores from the community IYCF training records of the training that was done in Zimbabwe from 2011 to 2013. In this manuscript a gap in the existing information on the analysis of the UNICEF training package pre- and post-test records with respect to the training of CCs is addressed.

1.9.5 Chapter 5

The purpose of Chapter 5 is to give the overall conclusions and recommendations of the study, with emphasis on the deductions from the study findings/results.

Chapter 2: LITERATURE REVIEW

2.1 Introduction

Training on IYCF has been given by the WHO/UNICEF from as early as 2003 in their global strategy on IYCF, which states: “Infants should be exclusively breastfed for the first six months of life to achieve optimal growth, development and health. Thereafter to meet their evolving nutritional needs, infants should receive safe and nutritionally adequate complementary foods while breastfeeding continues for up to 2 years of age or beyond”. This broadly represents EBF for the first six months and adequate complementary feeding from six months to two years. Recent evidence affirms that breastfeeding promotion has large effects on survival, while education on complementary feeding has positive effects on growth indicators in infants and young children (Bhutta *et al.*, 2013). The importance of IYCF has also been shown by its prioritisation in the recent scaling-up nutrition (SUN) movement (SUN, 2012). The SUN movement is a high-level country-based coordinating body that promotes the prioritisation of nutrition efforts in a country. These nutrition efforts are based on proven nutrition interventions from the Lancet series on child survival and from this series IYCF is one of the main nutrition strategies (SUN, 2012). However, for these interventions to have maximum effect, it is important to have a trained community-based workforce to promote and support mothers at community level. For this reason training of CCs is an important aspect of such interventions. In a subsequent section a description of content topics and methods of knowledge dissemination will be covered. The aim of this literature review is to present information relating to IYCF and explore the literature on IYCF capacity-building interventions. The different indicators used to assess IYCF practices at national level are also presented. Since the setting for the research in the mini-dissertation is Zimbabwe, the current situation relating to IYCF in Zimbabwe will also be reviewed.

2.1.1 Benefits of breastfeeding

Breastfeeding as a strong component of IYCF has a number of benefits. In pre-term infants breast milk has proven to be highly beneficial (Schanler, 2001; British Paediatric Association, 1994). The benefit is attributed to the large amounts of immunoglobulins, anti-inflammatory and immuno-modulating components present in breast milk (Schanler, 2001). These positive components in breast milk can be found in both fresh and pasteurised human milk (Walker, 2004). Breast milk has been proven to be non-exchangeable with any form of feeding, especially artificial feeding, owing to its uniqueness in function and composition. The ideal balance of nutrients in breast milk makes it easy for infants to digest and this is aided by digestive enzymes present in breast milk (Picciano, 2001). The importance of breast milk has

also been evident in its ability to meet the varying needs of a growing child (American Dietetic Association, 2001) as well as its assistance in infant gut maturation (Catassi *et al*., 1995). Breast milk also has positive effects on infants' brains, extending to both cognitive and visual function (Heinig & Dewey, 1996). In addition, it provides immune factors that fight illnesses specific to a mother's and infant's environment (Hanson, 2004). This comes through the baby's digestive system, which is protected by a coating derived from oligosaccharides contained in breast milk (Zivkovic *et al*., 2010).

2.1.2 Optimal complementary feeding

Complementary feeding in infants means the timely introduction of safe and nutritionally rich foods in addition to breastfeeding at about six months of age and typically provided from six months to 23 months of age (WHO, 2002). Metabolic activities occurring during pre- and post-natal development are affected by early nutrition. Timely and adequate complementary foods promote the optimal growth and functional development of a young child. In addition, complementary foods play a pivotal role in lifelong programming effects that modulate health, mortality risks, disease, behaviour and neural function, as well as quality of adult life (Koletzko, 2005; Metzger & Dale, 2010; Owen, 2006; Singhal & Lucas, 2004). Recent evidence shows a significant positive association of appropriate complementary feeding practices with height-for-age Z-scores (Reul & Menon, 2012). In an analysis of DHS data from 14 low-income countries (Marriott, 2012), consumption of a minimum acceptable diet was associated with improved nutritional indices. Even in food-insecure populations the provision of appropriate complementary foods is associated with improvements in height and weight for age Z-scores (Bhutta *et al*., 2013). Policy guidelines on appropriate early feeding practices from 0 to 6 months and the benefits thereof are clear (Lutter, 2013). However, policies and guidelines for appropriate complementary feeding lack the same level of clarity. More evidence on the impact of complementary feeding interventions, especially with respect to specific complementary food to address stunting, is still needed (Bhutta *et al.*, 2013). In programming it is advised to avoid approaches that can affect the intake of breast milk negatively, through much emphasis on complementary food at inappropriate times (Dewey & Adu-Afarwuah, 2008). Addressing these issues properly will require adequate community-based counselling capacity for mothers and caregivers.

A comprehensive IYCF strategy can comprise action on three levels: national level processes and actions, health service level actions and community level actions (UNICEF, 2011). At the community level the most important design and planning step is a decision on an appropriate community worker or lay counsellor profile to be responsible for IYCF promotion, counselling and support. A primary process for the identified personnel is planning of their training as a way

to equip them as agents to promote and motivate appropriate IYCF (UNICEF, 2011). Capacity building and training form a pivotal and important factor in the quest for optimum community health personnel performance (Lehman, 2007). All this makes it important to consider training and capacity building in addressing IYCF.

The aim of this literature review is to provide details on the factors influencing IYCF at community level and the value of capacity building and/or training of community personnel. A section will provide information on the IYCF situation in Zimbabwe and the strategies implemented in Zimbabwe to tackle IYCF. A section of this review will place emphasis on the UNICEF cIYCF training package.

2.2 Factors influencing infant and young child feeding

IYCF is affected by a number of factors set by the WHO (2003), one of which is general negligence of the health and nutrition of women, since this is where the feeding of infants and children begins. Social changes occur rapidly and make it difficult for families to feed and care for their children. The risk of HIV transmission through breast milk poses a great challenge, even among unaffected families. Women in employment or self-employment are challenged to practise adequate IYCF owing to varying work-related commitments (WHO, 2003). The influence of the private sector, through continued violation of the code for the marketing of breast milk substitutes, also poses a great problem affecting optimum IYCF (personal communication). In practice, factors affecting IYCF are mixed breast and bottle feeding in the early period, such as the first month, and also the early introduction of complementary foods, especially at three months (Nasreddine *et.al*., 2012). The early introduction of non-milk fluids such as water, sweetened water, herbal teas and traditional medicines is a major challenge as factors affecting IYCF (Nasreddine *et.al*., 2012). These challenges exist despite evidence to show that there is no benefit in introducing solid foods to infants before the age of six months (Kramer & Kakuma, 2009). In other findings as well, the introduction of complementary foods between four and six months of age was not associated with any additional benefits for infants (WHO, 2002). Positive studies have shown that delaying the introduction of solid food until six months reduced the incidence of diarrhoeal diseases (Lartey, 2000) and increased growth patterns (Hop *et al*., 2000).

Appropriate IYCF is influenced by a range of factors, which include social, economic, religious and cultural ones. A study in a Sub-Saharan African country, Kenya, provided practical evidence of the factors influencing IYCF practices. Social factors included the perception that mothers did not have enough breast milk and this resulted in the introduction of other foods. An economic factor mentioned was the perception mothers have that if they have access to money, it is an indication of their ability to provide adequate feeding to their infants and children

(Ministry of Kenya, 2011). These factors can be compared or related to a larger perspective in the majority of other Sub-Saharan African countries.

2.2.1 Interventions for IYCF

Breastfeeding or EBF is learned and virtually all mothers can breastfeed, provided they have accurate information and support within their families and communities, especially support from health personnel (WHO, 2003). Complementary feeding, on the other hand, is dependent on accurate information and skilled support from the family, community and health care personnel (WHO, 2003). Most convincing is the fact that appropriate food and feeding practices are a greater determinant of malnutrition than the lack of food/food insecurity (WHO, 2003). Educational interventions on IYCF can be useful to increase positive behaviour regarding adequate and appropriate IYCF practices (de Onis *et al*., 2013). A study focusing on five Sub-Saharan African countries has shown the importance of nutrition education in order to increase appropriate knowledge on IYCF among health personnel (Alles, 2013). Quality nutritional education on IYCF is important, as its absence will be a challenge in adequate IYCF.

To improve breastfeeding practices, peer and lay support have a positive effect on the duration of EBF and increased early breastfeeding initiation (Fairbank *et al*., 2000). Professional counsellors aid in extending the duration of breastfeeding among mothers (Sikorski *et al*., 2002). Maternity care practices increase breastfeeding initiation and duration rates (Perez *et.al*., 1992). Support for breastfeeding is another intervention that influences breastfeeding duration, especially in industrialised countries (Cohen & Mrtek, 1994). The use of the media has proven to improve attitudes to breastfeeding and initiation rates (Sikorski *et al*., 2002), while social marketing is quite an effective behaviour change model to influence breastfeeding (Ling *et al*., 1992). A variety of community-directed breastfeeding promotion and support programmes influence breastfeeding practices, especially in developing countries (WHO, 2003).

Looking at interventions directed at complementary feeding, nutrition education directed at caregivers has positive effects on improving complementary feeding practices (Guldan *et al*., 2000; Bhandari *et al*., 2004). The use of locally available food influences complementary feeding through food combinations (Ferguson *et al.* 2006), causing traditional processes to enhance the bioavailability of complementary foods (Moursi *et al.*, 2003), inclusion of animal source foods as a way to improve diet quality (Santos *et al.*, 2001) and interventions to facilitate poultry production and home gardening (Dewey *et al.*, 2008). The use of micronutrient supplements, including vitamin-mineral powders, is also an influencing intervention towards IYCF complementary feeding (Zlotkin *et al.*, 2003; Adu-Afarwuah *et al.*, 2007). In the event of food-insecure population groups, social schemes and food distribution influence adequate complementary feeding in those population groups (Rivera, 2004).

2.2.2 Training and capacity development for IYCF

Training and capacity building of IYCF personnel is very important, given the established need for proper education in IYCF (Lehman, 2007). A lot of effort has been put into IYCF training and capacity development. This section is dedicated to an in-depth review of the training packages that have been developed. Training on the code for marketing of breast milk substitutes also formed part of this; however, its emphasis is beyond the scope of this study.

The UNICEF and WHO, together with other players, have developed several training packages, listed in Table 2.1, to promote skills development among health workers, including CCs. These packages include the “BFHI 18-hour (later changed to 20-hour) course” and the “WHO/UNICEF Breastfeeding Counselling: A 40-hour course”. Other training courses/modules followed, such as the “Five-day integrated course IYCF - An integrated course for primary care workers on infant feeding” and the “Three-day course in HIV and infant feeding”. These training courses have been tailored to build a team of trainers who can cascade the training from national level. Zimbabwe was one of the countries that have been able to implement this training through training of district managers and senior clinicians, who then led in conducting the training (UNICEF, 2005).

Table 2.1: List of WHO and UNICEF developed training packages

Name of training package	Duration of training	Target audience
Baby-friendly Hospital Initiative (BFHI)	18/20 hours	Health workers
Breastfeeding counselling training course	40- hour training	Health workers
Integrated course on Infant and Young Child Feeding	5 days	Primary care health workers
HIV and Infant Feeding course	3 days	Health workers
UNICEF Community Infant and Young Child Feeding training	3/5-day training	Community health workers

The BFHI course for training health-workers was designed as a tool to promote and support breastfeeding by following ten steps (see Box 1). The goals were to improve breastfeeding practices in maternity wards in the health system, to educate all health workers on the importance and basic skills of breastfeeding support and enforce the principles of the

international code for the marketing of breast-milk substitutes in facilities especially targeted to capacitate health workers working with mothers in maternity wards.

BOX 1: Ten steps to successful breastfeeding (in maternity services)

1. Have a written breastfeeding policy that is routinely communicated to all health care staff.

2. Train all health care staff in skills necessary to implement this policy.

3. Inform all pregnant women about the benefits and management of breastfeeding.

4. Help mothers initiate breastfeeding within a half an hour of birth.

5. Show mothers how to breastfeed, and how to maintain lactation even if they should be separated from their infants.

6. Give newborn infants no food or drink other than breast milk unless medically indicated.

7. Practice rooming in - allow mothers and infants to remain together - 24 hours a day.

8. Encourage breastfeeding on demand.

9. Give no artificial teats or pacifiers (also called dummies or soothers) to breastfeeding infants.

10. Foster the establishment of breastfeeding support groups and refer mothers to them on discharge from the hospital or clinic.

Baby-Friendly Hospital Initiative, Training Manual, WHO

Through the BFHI training a hospital/clinic (with emphasis on maternity facilities), after having managed to follow all ten steps, is awarded a certificate. The certificate is and/or was mainly awarded after following external and internal review and assessment processes (UNICEF, 2005). This course includes a component of community support with a direct link to the facilities. However, many of the facilities have been reported to have failed to get BFHI certificate status because of a weak or non-existent community-based structure (personal communications).

Two surveys (USAID-LINKAGES and UNICEF 2002) have shown that the BFHI steps are quite feasible and practical to be implemented at national level. However, many challenges resulting from the BFHI training have also been reported. For instance, the UNICEF 2002 report clearly

states that lack of commitment in terms of staff turnover and departure of BFHI supporters (trained health workers) has been an impediment in success emanating from the BFHI training. An evaluation done in Brazil showed positive/beneficial effects on breastfeeding indicators due to the use of the BFHI training (Venancio *et al*., 2012).

The "WHO/UNICEF Breastfeeding Counselling: A 40-hour course", was another course that was introduced after the *innocenti* declaration initiative. Its main goal was to train health workers so that they would be able to counsel mothers on adequate breastfeeding practices. This course played a part in cascading training on breastfeeding and it was shown in Brazil to be effective in changing the knowledge of health workers about breastfeeding counselling (Rea, 1999; Westphal, 1995). The evaluation of knowledge was done using pre- and post-tests containing 13 multiple-choice questions on topics covered in the training and the study design followed a randomised controlled trial in a health facility (Rea, 1999). An evaluation of this kind is crucial, as it can help to give an indication of the usefulness of training in imparting knowledge to health workers. This can hence ensure the effectiveness of the training on the initial levels. However, it remains important to consider changes in the breastfeeding practices of mothers, which are expected to result from the positive knowledge changes. This evaluation, similar to what was done in the pre- and post-test, can further be useful for mentorship and gap identification processes.

In 2006 other courses were developed, directed at capacitating health workers in IYCF, especially with emphasis on bringing into perspective complementary feeding and HIV/AIDS issues. These courses have been implemented at various levels, but documented evaluations of the effectiveness of the training on knowledge have not been reported, particularly in the Zimbabwean context (personal communications).

The emergence of IYCF training packages from the time of the *innocenti* declaration left a gap for a training package directed at community level cadres. UNICEF in 2009-2010 satisfied this gap through the development of a generic training package for community IYCF counselling (UNICEF, 2013). This package was field-tested in August 2010 in Lusaka, Zambia (UNICEF, 2011). The package (downloadable from: http://www.unicef.org/nutrition/index_58362.html) provides a fully integrated set of materials for use at community level. It includes nine components, including tools to support planning and adaptation at country level, counselling and behaviour change (UNICEF, 2011), supervision, mentoring and monitoring (UNICEF, 2013). This package is based on an adaptation of the WHO/UNICEF 2006 integrated IYCF counselling course crafted for low-literacy cadres. It addresses breastfeeding issues, complementary feeding, maternal nutrition, the latest guidelines on HIV and infant feeding, IYCF in emergencies and IYCF in the context of severe acute malnutrition (UNICEF, 2013).

Development of the community IYCF materials by UNICEF was done through the Academy for Educational Development LINKAGES project, the CARE USA and URC/CHS. The Emergency Nutrition Network production on the integration of IYCF support into CMAM (Community Management of Acute Malnutrition) was also incorporated in the training package (UNICEF, 2011). The technical content of the package seeks to reflect the guidelines on HIV and infant feeding 2010, principles and recommendations for infant feeding in the context of HIV and a summary of evidence related to IYCF in the context of HIV. The graphics of the package draw heavily from the IYCF behaviour change materials and other job aids, which have been developed with technical support of an organisation, URC/CHS, (UNICEF, 2011).

The UNICEF generic cIYCF training contains tools that equip community-based cadres with an interactive and experiential adult learning approach. This is meant to enhance their skills in counselling, problem solving, negotiation and communication. All this prepares the cadres to use the related job aids and counselling tools of the training package effectively. To implement the generic cIYCF training package, it can be structured over five days, with the possibility of being adapted for three days. It is made up of 19 sessions.

What is of particular interest in the training package is the administration of pre- and post-tests (Table 2.2)

These are meant to test the knowledge of trainees before and after the training. The tests consist of a set of 15 yes/no/I don't know response questions, which cover all nine components of the training. The pre- and post-test questions are used as a measure to check change in knowledge after training of the IYCF CCs.

Table 2.2: The UNICEF community IYCF training 15 pre- and post-test questions

Question No	Pre-/Post-test Question
1	The purpose of an IYCF support group is to share personal experiences on IYCF practices.
2	Poor infant feeding during the first two years of life harms growth and brain development.
3	A child aged six to nine months needs to eat at least twice a day in addition to breastfeeding.
4	A pregnant woman needs to eat one more meal per day than usual.
5	At four months, infants need water and other drinks in addition to breast milk.
6	Giving only information to a mother on how to feed her child is effective in changing her infant feeding practices.
7	A woman who is malnourished can still produce enough good quality breast milk for her baby.
8	The more milk a baby removes from the breast, the more breast milk the mother makes.
9	The mother of a sick child should wait until her child is healthy before giving him/her solid foods.
10	At six months, the first food a baby takes should have the texture of breast milk so that the young baby can swallow it easily.
11	During the first six months, a baby living in a hot climate needs water in addition to breast milk.
12	A young child (aged 6 to 24 months) should not be given animal foods such as eggs and meat.
13	A newborn baby should always be given colostrum.
14	An HIV-infected mother should never breastfeed.
15	Men play an important role in how infants and young children are fed.

Source: UNICEF community IYCF Training Facilitator guide

2.2.3 The WHO indicators for infant and young child feeding

It is important to monitor trends in IYCF practices at national level in order to inform progress. For this reason different indicators have been developed, which are presented here.

To appreciate the factors influencing IYCF appropriately, the WHO has developed different indicators used to assess adequate and appropriate IYCF globally (WHO, 2008). Ten of these indicators and the way in which they are calculated are presented in Table 2.3.

Table 2.3: Ten WHO Indicators for assessing infant and young child feeding

Indicator	Definition and Calculation of the Indicator
Indicator 1: Timely initiation of breastfeeding (Children 0-23 months)	Definition: In this indicator it is defined as the proportion of children 0-23 months that were put to the breast within one hour. Calculation: Numerator - number of children 0-23 months who were put to the breast within the first hour of birth, divided by denominator - number of children 0-23 months old.
Indicator 2: Exclusive breastfeeding under six months	Definition: The proportion of infants 0-5 months of age who were fed exclusively with breast milk in the past 24 hours. Calculation: Numerator - number of infants 0-5 months who received breast milk in the past 24 hours and did not receive any other food or liquids in the past 24 hours divided by denominator - number of infants 0-5 months old.
Indicator 3: Timely complementary feeding	Definition: Percentage of infant's 6-9 months of age who receive breast milk and a solid or semi-solid in the previous 24 hours. Solid, semi-solid and soft foods are defined as mushy or solid foods, not fluids. Calculation: Numerator - number of infants 6-9 months who breastfed in the past 24 hours and who also received at least one food in the past 24 hours divided by denominator - number of breastfed infants 6-9 months old
Indicator 4: Introduction of solid, semi-solid or soft foods	Definition: Proportion of infants 6-8 months who receive solid, semi-solid or soft foods Calculation: Numerator - Number of infants 6-8 months who received at least one food in the past 24 hours divided by denominator - number of infants 6-8 months old.
Indicator 5: Continued breastfeeding at one year. (An alternative indicator is continued breastfeeding at two years of age - when children are 20-23 months old.)	Definition: The proportion of children 12-15 months old who are fed breast milk Calculation: Numerator - number of children 12-15 months who received breast milk in the past 24 hours divided by denominator - number of children 12-15 months old.
Indicator 6: Proportion of children 6-23 months who received food from four or more food groups in the past 24 hours	Definition: The seven food groups used to calculate this indicator are i) grain, root tubers ii) legumes and nuts iii) dairy products (milk, yogurt, cheese) iv) flesh foods (meat, fish, poultry, liver/organ meats) v) eggs vi) vitamin A-rich foods and vegetables vii) other fruit and vegetables. Calculation: Children from 6-23 months who

Indicator	Definition and Calculation of the Indicator
	received food from four or more of the seven food groups in the past 24 hours divided by denominator - number of children 6-23 months old.
Indicator 7: Minimum meal frequency	Definition: The proportion of breastfed and non-breastfed children 6-23 months of age who receive solid, semi-solid or soft foods the minimum number of times or more. Calculation: Number of breastfed children 6-23 months of age who received solid, semi-solid or soft foods the minimum number of times or more during the previous day divided by number of breastfed children 6-23 months old. Alternative calculation: Non-breastfed children 6-23 months of age who received solid, semi-solid or soft foods the minimum number of times or more during the previous day divided by non-breastfed children 6-23 months old.
Indicator 8: Minimum acceptable diet	Definition: The proportion of children 6-23 months of age who receive a minimum acceptable diet (apart from breast milk) - calculated for breastfed and non-breastfed children. Calculation: Breastfed children: Numerator: Breastfed children 6-23 months who had at least the minimum dietary diversity and minimum meal frequency in the past 24 hours divided by denominator - breastfed children 6-23 months Calculation: Non-breastfed children: Numerator – non-reastfed children 6-23 months who had at least the minimum dietary diversity and minimum meal frequency in the past 24 hours divided by denominator - non-breastfed children 6-23 months old.
Indicator 9: Consumption of iron-rich or iron-fortified foods	Definition: The proportion of children 6-23 months old who receive an iron-rich food or iron-fortified food that is especially designed for infants and young children or that is fortified in the home. Calculation: Numerator: Number of children 6-23 months who received at least one iron-rich or iron-fortified food divided by denominator - number of children 6-23 months old.
Indicator 10: Bottle feeding	Definition: The proportion of children 0-23 months who were fed with a bottle during the previous day. Calculation: Numerator: Children 0-23 months who were fed with a bottle during the previous

Indicator	Definition and Calculation of the Indicator
	24 hours divided by denominator – number of children 0-23 months old.

Source: WHO, (2008)

It is important to look at the background for the IYCF indicators. The IYCF indicators have been developed from research done by principal investigators who were part of the working group on Infant and Young Child Feeding Indicators. The Principal investigators were involved in a 10-site analysis research which assisted to build the research evidence which directed the development and latest updating of the IYCF indicators (Conclusions of a consensus meeting, 2007). More than a decade has elapsed since the introduction of a set of IYCF indicators for assessing breastfeeding practices (WHO, 1991), proposed for use by countries to assess infant feeding and evaluation of breastfeeding promotion efforts. In this section concentration is placed on the new revised set of IYCF indicators. To illustrate some of the revisions were based for example, the World Health Organization(WHO) in the first version of the indicators the recommendation for introduction of complementary foods at 4-6 months. This was revised following research supporting exclusive breastfeeding for the first 6 months (WHO, 2001& WHO, 2001b). Such a result made the previous indicator on exclusive breastfeeding 0-4 months inconsistent with the new evidence and hence for revision.

Looking at complementary feeding, the first set of indicators had only one indicator for complementary feeding which was the timely complementary feeding rate. The indicator lacked information about the quality and quantity of complementary feeding rate. The indicator lacked information about the quality and quantity of complementary foods. This gap resulted in the WHO from the year 2002 publishing a conceptual framework for identifying potential indicators of complementary feeding practices (Reul *et al.,* 2003). In addition further evidence on complementary feeding for the breastfed child (PAHO/WHO, 2004) and the non-breastfed child Dewey *et.al.,* (2004) was developed and this was synthesized into a parallel guiding principles(WHO, 2005). In 2004, the working group on IYCF indicators started activities aimed at defining and validating the indicators for reflecting dietary quantity and quality making use of existing data sets from 10 different sites in developing countries (Conclusions of a consensus meeting, 2007). As part of the activities, the process was guided by the targets and recommendations of the Global Strategy for Infant and Young Feeding(WHO/UNICEF, 2003). A synthesis or reports of the results from the analyses carried out by the working group on IYCF indicators can be assessed from the analyses carried out by the working group on IYCF indicators can be assessed from the working groups reports of 2006 and 2007 (Working group of Infant and Young Child Feeding, 2006).

The finalisation of the IYCF Indicators was then perfomed at the WHO Global Consensus Meeting held in November 6-8, 2007. The concensus gave birth to the 8 core IYCF indictors and the 7 optional IYCF indicators for assessing infant and young child feeding. These IYCF indicators are population-based and can be derived from household survey data.

The purpose of the IYCF indicators is to provide a measuring unit for improving feeding practices for children 6-24 months. This is motivated by the fact that IYCf practices directly affect the nutritional status of children under 2-years of age and ultimately impact on child survival. Having optimum IYCF practices is therefore critical for improving health, nutrition and the development of children.

The current set of IYCF indicators (8-core and 7-optional) were designed to provide a simple, reliable and valid population-level based indicators for assessing IYCF practices(Conclusions of a consensus meeting, 2007). At population level the IYCF indicators are used for,

- Assessment- to make national and sub-national comparisons and to describe trends over time.

- Targeting- to identify populations at risk, target interventions and make policy decisions about resource allocation.

- Monitoring and evaluation- to monitor progress in achieving goals and to evaluate the impact of interventions.

Applicability of the IYCF indicators (8-core and 7-optional) are mainly for use in large scale surveys or national programs. At a smaller(local) and regional level, it may possibly find uses for the IYCF indicators however the limited set of measures cannot meet all the needs for program monitoring and evaluation at this particular level. A recommendation would be to augment the IYCF indicators with more specific indicators which reflect the objectives of the particular program/project. In addition due to the small sample sizes used in smaller scale programs, some of the recommended IYCF indicators may be too imprecise to be used for assessment or for monitoring change. An example would be for IYCF indicators with narrow age ranges in the numerator and the denominator(Conclusions of a consensus meeting, 2007).

The data for IYCF indicators is collected from interviews conducted at the household level making use of household level making use of household survey methodologies. Data for the indicators can be generated using data from living children of less than 24 months of age. An inclusion of deceased children is only considered on the IYCF indicator calculation such as “early initiation of breastfeeding “.

When the survey is being done, mothers will not be asked when they started or stopped particular feeding practices. The previous-day recall period is used with the objective to describe infant feeding practices within the populations and this approach was discovered as appropriate following widely used past surveys for dietary intake. Since practices are likely to vary from day to day, indicators derived from the previous day recall should not be used to make assessment at individual level. The IYCF indicators come with a criteria which is used for defining the indicators and it seeks to classify a child as following a particular practice if the criteria listed for that practice is met (Conclusions of a Consensus meeting, 2007). For example, one interesting modification is on exclusive breastfeeding where Medicine in particular ORS(Oral Rehydration Solution) was agreed for it to be included under the definition of exclusive breastfeeding . This then means Exclusive Breastfeeding now means that the infant receives breastmilk (all forms of breastmilk) and to receive ORS, drops, syrups(vitamins and minerals) but nothing else (Conclusions of a consensus meeting).

The term complementary feeding is no longer used for assessing IYCF indicators practices and it is represented by the indicator “Introduction of solid,semi-solid or soft foods” which is a measure of a single feeding practice . Nevertheless, the term complementary feeding is still very useful to describe appropriate feeding practices in children 6-24 months of age and will continue to be used in programmatic efforts to improve infant and young child feeding as guided by the Global Strategy on Infant and Young Child Feeding.

2.3 Infant and young child feeding in Zimbabwe and strategies to promote optimal practices

The Zimbabwe DHS 2010-2011 provided a series of statistical data on the IYCF situation in Zimbabwe (ZIMSTAT, 2012). Generally it shows that there is still a lot of effort that needs to be made to ensure maximum coverage of proper/adequate IYCF practices. Hope to increase coverage is driven by the recent immense success of the community IYCF programme roll-out, which has been a clear demonstration of the effect of high commitment and investment to ensure progress towards adequate and appropriate IYCF by the MoHCW , 2013.

ZIMSTAT used some of the indicators given in section 2.2.3 in the DHS 2010-2011. Taking a closer look, the IYCF indicators have shown that the rate of EBF for infants remains low (Table 2.4).

Table 2.4: IYCF Indicators in Zimbabwe based on DHS, 2010-2011

IYCF Indicator	Percentage (%) represented
EBF for under 6 months of age	31
EBF at 4-5 months of age	15
Continued breastfeeding at 1 year	87
Introduction of solid, semi-solid or soft foods at 6-8 months	86
Continued breast feeding at 2 years	20
Age-appropriate breastfeeding at 0-23 months	58
Predominant breastfeeding at 0-5 months	60
Bottle feeding at 0-23 months	8

Source: ZIMSTAT, (2012)

Similar indicators in relation to complementary feeding still show low levels in relation to the minimum acceptable diets (Table 2.5), aggregated in terms of breastfed and non-breastfed children.

Table 2.5: IYCF indicators in Zimbabwe in relation to complementary feeding for children 6-24 months

Indicator	Breastfed babies	Non-breastfed babies	All children
Children with minimum dietary diversity (%)	19	37	24
Minimum meal frequency (%)	46	42	45
Minimum acceptable diet (%)	13	5	11

Source: ZIMSTAT, (2012)

A recent study in Zimbabwe, published by the MoHCW (2013), provided a comprehensive review of IYCF in the country. The IYCF situation in Zimbabwe can best be described by looking at 10 main components of IYCF in the country.

The country has recently established a national comprehensive IYCF policy, moving from a draft policy that had been in existence for a long while (MoHCW, 2013). This IYCF policy has components guiding into the policies and guidelines of other Ministry of Health Departments and related government ministries (MoHCW, 2013). The international code of marketing of breast

milk substitutes was implemented in Zimbabwe through the enactment of Statutory Instrument 46 in 1998 as a public health (Breast Milk Substitutes and Infant Nutrition) regulation (Government of Zimbabwe, 1998). A committee was set up to monitor the code and it was in operation until 2009. Recently 94.6% of health care workers have been shown to be compliant with the code for marketing of breast milk substitutes (MoHCW, 2013).

In 2005, Zimbabwe adopted some of the provisions of the International Labour Organisation Maternal Protection Convention 183 of 2000 (ILO, 2000). This was to enable working mothers time to attend to their babies during breastfeeding. In addition, an amendment was issued in 2005 to allow mothers an hour of breastfeeding breaks daily for a six-month period. The BFHI was implemented in 1992 and by 2006 (latest data), the country had 49 hospitals certified as baby-friendly (MoHCW, 2013).

To deal with lack of training in IYCF, the MoHCW Nutrition Department in the early 1990s embarked on a multi-sectoral approach towards capacity building of health and non-health professionals involved with nutrition (MoHCW, 2013). To date in-service and pre-service training continues, with a variety of schools and education programmes offering training addressing breastfeeding and complementary feeding (MoHCW, 2013). Communication and information materials are widely distributed during the yearly Breastfeeding Week held every August. However, the communication strategy for the IYCF programme remains inadequate (MoHCW, 2013).

Community-based activities related to IYCF have been organised by VHWs and implemented through the introduction of various programmes to protect, promote and support mothers in appropriate IYCF. The IYCF-directed programmes include community-based growth monitoring and promotion, Health Harvest training (UN-FAO) and the mainstreaming of nutrition into the Protracted Relief Programme (MoHCW, 2013). In August 2011 community-based IYCF counselling training was initiated as a way to impart counselling skills to VHWs (MoHCW, 2013). The MoHCW adopted the first recommendations on infant feeding in the context of HIV in 2006 and enhanced this with the advent of the 2010 WHO guidelines on infant feeding and HIV (MoHCW, 2013).

The integration of IYCF services with other maternal and child health services in Zimbabwe poses a big challenge that can only be dealt with by the MoHCW Nutrition Department (MoHCW, 2013). There is a need to address the current situation, which has seen structures being run in vertical and parallel ways (MoHCW, 2013). Monitoring and evaluation of IYCF are at present weak in Zimbabwe (MoHCW, 2013). Funding for IYCF mostly relies on donors and partners operating in the country, such as USAID, UNICEF, the WHO, World Food Programme and Food and Agricultural Organisation (MoHCW, 2013). There is still a great need to facilitate

a forum to enable sharing of IYCF-related research findings in Zimbabwe (MoHCW, 2013). All this shows a need to address IYCF at all levels in Zimbabwe.

2.4 Strategies for optimum infant and young child feeding in Zimbabwe

In Zimbabwe a number of strategies have been implemented to address and attain optimum IYCF in the country. One of the main strategies that the country has spearheaded was the training of health workers at national level, taking the lead in this initiative (UNICEF, 2005). However, despite the training in Zimbabwe, after seven years EBF rates and appropriate complementary feeding practices remain low (UNICEF, 2012).

In Table 2.6 a comparison of the key activity relating to IYCF in Sub-Saharan neighbouring countries, Zambia and Zimbabwe, is provided. For the purpose of comparison, emphasis is placed on capacity building (UNICEF, 2005) and the key IYCF indicator for the two countries is EBF (DHS, 2010-2011).

Table 2.6: Comparison of capacity development versus EBF rates for Zambia and Zimbabwe

Country	Capacity development sub-score (lowest score, 0 and highest 10), 2006	Trained community health workers in community-based IYCF since 2006	Number of community health workers trained as part of another health course from 2006-2009	Exclusive breast-feeding rates
Zambia	10	60	187	60.9%
Zimbabwe	10	nil	nil	31%

Source: DHS, Zambia and DHS, Zimbabwe

As highlighted earlier, capacity development of health workers has been placed as an important strategy in the *innocenti* declaration. This has been carried out well in Zimbabwe, as seen in Table 2.6, with the highest scores in capacity development of health professionals. However, Zambia took up the further training of community-based health workers, while Zimbabwe just trained professionals. Taking capacity building/training as a surrogate measure for influencing EBF, lower rates in Zimbabwe can be related to the lack of trained community health workers. A quick extrapolation can obviously lead to the conclusion that the 60.9% EBF rate in Zambia can

be attributed to efforts to implement IYCF at community level. The 31% EBF in Zimbabwe can be hypothesised to have been due to lack of a community IYCF initiative. The rates in Zambia might further be improved through increased numbers of trained community-based health workers. However, it can even be helpful to do formal training evaluations, to ensure lesson learning and appropriate adjustments.

Still considering the two countries, it can be postulated that the training has had an effect on increasing the knowledge of the trainees. Nonetheless, an assessment of the training's effect on changing knowledge is required. This can assist in establishing a consistent monitoring and evaluation system at community level. At the time of the assessment Zambia was recorded as having no existing community level monitoring and evaluation system for its community-based programmes. This might have resulted in low EBF rates not reaching 100%. An investment in a mentoring, monitoring and evaluation system might be a crucial initiative, but it needs to start by evaluating the effectiveness of the training. This would enable measurement of how each of the trainees appreciated/understood the initial training, which could enhance the implementation of support and mentorship programmes to ensure that the correct information is indeed reaching the communities.

More recently the country has undertaken to engage through high investments in the introduction of IYCF efforts at community level (MoHCW, 2012). This was motivated by the apparent need to build the capacity of VHWs to support mothers and caregivers to adopt optimal infant feeding practices and to refer complicated issues to health institutions (Dube *et al.*, 2012). The introduction of the UNICEF community IYCF counselling package was important in covering a need that had already been established: to strengthen and scale up effective IYCF counselling in the community (Dube *et al.*, 2012).

In mid-2011, the MoHCW in Zimbabwe, through the Department of Nutrition, implemented cIYCF training. Workers in 12 districts were trained between August and December 2011. In the 12 districts, close to 2000 VHWs were trained to support an initial 20 000 women from pregnancy to 24 months of lactation (Dube *et al*, 2012). Each of the trained VHWs also initiates and facilitates at least one mother support group in the community to allow women to share experiences and support one another with optimal infant feeding practices. Community counsellors/VHWs refer mothers with complications they cannot handle to the local health centre and the health centre staff likewise refer mothers who need community support to the CCs (Dube *et al*, 2012).

The implementation of the training followed the five-day training approach with the administration of pre- and post-test questions. This training has been a positive step in starting to capacitate/train IYCF personnel operating at community level. However, the quality of the

training and continued/sustained supervision of the community workers make a positive difference in sustaining the propagation of the information imparted to the trained workers (Labbok, 2012).

It is important to note that the introduction of the community IYCF programme was unfortunate to be set on an already existing weak IYCF monitoring structure (MoHCW, 2012). This is in addition to lack of any form of follow-up to training in the short and long term. In the short term simple evaluation of knowledge change scores can be undertaken as a way to advise on the performance of the trainees and hence problematic areas. This type of comprehensive informative evaluation has not been done since the introduction/implementation of the UNICEF community IYCF package, despite the package coming with pre- and post-tests. In the long term it will need follow-up of the counsellors to evaluate change in practices in the community and the quality of the counselling they are giving the communities. It is the purpose of the current study to extract some informative value from the pre- and post-test training records of the cIYCF training. This can potentially serve as input into the monitoring structure for IYCF.

2.5 Conclusion

This literature review section has provided a synthesis of information in the literature on IYCF, with particular emphasis on capacity building. The WHO and UNICEF are the main players that have led the development of training materials for IYCF, targeting mostly health professionals. Later in 2010 UNICEF took a leading role in introducing the first training package to extend IYCF training services at community level. This was evidenced by the release of the UNICEF cIYCF training package.

The WHO indicators on IYCF play a pivotal role in assessing IYCF in countries and can be divided into core indicators and optional indicators. Use of the indicators can help to analyse EBF rates and appropriate complementary feeding practices.

Zimbabwe has low rates of EBF and few children receive the adequate recommended amounts of complementary feeding. The country has played a leading role in rolling out training packages for capacity building of health workers. This has involved the implementation of the UNICEF community IYCF training package with the purpose of extending training to community-based workers/VHWs.

This literature review reflects that the UNICEF community IYCF training package is the first generic package introduced for taking IYCF services to community level. Currently no analysis is presented in literature of the implementation of the UNICEF cIYCF training package.

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Chapter 3: MANUSCRIPT 1: UNICEF TRAINING PACKAGE FOR SCALING UP SKILLED COMMUNITY INFANT AND YOUNG CHILD FEEDING COUNSELLORS: ZIMBABWE EXPERIENCE

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Submission type: Great Educational Material (GEMs)

First manuscript submission for reviewers: June, 2014

Feedback received from reviewers: September, 2014

Manuscript revisions submission for reviewers: October, 2014

Current submission status: Accepted for Publication in May/June issue Journal of Nutrition Education and Behaviour.

3.1 Abstract/summary of educational material

UNICEF developed a generic counselling package on community-based infant and young child feeding (IYCF) counselling based on WHO/UNICEF guidelines and lessons learned in the implementation of community-based IYCF programmes and adult learning. We report on the experience of training conducted at six centres in a Zimbabwean district. The training package is adaptable to different situations and could serve different purposes.

3.2 Introduction

In the context of improving nutrition in Zimbabwe and other developing countries, the need to the build capacity of community based health workers (CBWs) is well recognized[1]. This capacity is needed to support mothers and caregivers on optimal infant and young child feeding (IYCF) practices and for timely referrals to the health institutions on issues beyond CBWs expertise[2]. In Zimbabwe and other developing countries facing a high burden of child malnutrition[3], there is a need to increase the numbers of skilled IYCF counseling services at community level. The UNICEF global generic community IYCF training and counseling package, was introduced (2011) in Zimbabwe[4]. The aim of this great educational material is to describe the Zimbabwe experience in using the UNICEF IYCF training package and recommend its use in similar developing country settings.

3.3 Programme description and implementation

The UNICEF generic community IYCF training has 20-sessions delivered over 5-days. It takes 30 minutes to a maximum of 4 hours per training session (Table 1). The adaptation of the training package takes into account the prevailing community context. Adult learning techniques and guidelines are used and also considered in the

adaptation process[5,6]. This makes the training material and delivery process relevant to the target audience. The training process is implemented using available community structures (Figure 1) such as primary health care centers. The package was implemented in Zimbabwe starting with building a pool of national level trainers who then administered the training at district level [4]. The community counselors (CCs) trained included mainly village health care workers but also a few nurses and community volunteers. A maximum of 6 training sites per district were targeted leading to a total of 150 trained CCs for each of the 15 districts trained.

The proportion of CCs getting correct responses, per training site on the 15 evaluation questions were computed to represent knowledge scores. The difference in knowledge scores from pre to post-training were used to give a proxy indication of the effect of the training on IYCF knowledge. Normality testing of knowledge score data was done using Q-Q plots and the data were found to be normally distributed. Paired t-tests were used to determine if there were significant differences in the average knowledge at pre compared to post-training for each district. An ANOVA test was also performed to compare the average change in knowledge scores from pre to post training among the 15 districts.

Table 3.1 Topics/Sessions Covered and Daily Duration of the UNICEF Community IYCF Training

Training day	Session number	Topic(s) covered	Time/hours covered
1	1	Introductions, pre-assessments	1 hour
	2	Why IYCF matters	1 hour
	3	Common situations that affect IYCF	1 hour
	4	How to counsel: Part 1	1 hour
	5	Recommended IYCF practices: Breastfeeding	1 hour 30 minutes
	6	How to breastfeed	1 hour 30 minutes
2	7	Recommended IYCF practices: Complementary feeding 6-24 months	1 hour 30 minutes
	8	Complementary feeding	1 hour
	9	How to counsel: Part 1	1 hour
	10	How to counsel: Part 2	1 hour
	11	Common breastfeeding difficulties	1 hour 30 minutes
3	12	Field visit practice 1	4 hours
	13	How to conduct: Action-oriented groups, IYCF support groups, home visits	2 hours
4	14	Field visit practice 2	4 hours
	15	Women's nutrition	1 hour 30 minutes
	16	When to bring the sick child to the health facility	30 minutes
5	17	Infant feeding in the context of HIV	2 hours
	18	Integrating IYCF support into CMAM community services	1 hour
	19	IYCF in emergencies	1 hour
	20	Post-assessment evaluation	1 hour

Figure 3.1: Illustration of in-class and field practice sessions for competence capabilities among the trained community counsellors

3.4 Training evaluation

The CCs evaluated how they experienced the training objectives, methods, materials and the field practice used on a 3-point Likert scale (good, average or unsatisfactory) (Table 3.2). The training package includes 15 yes/no/I don't know evaluation questions which are administered pre and post training (Supplementary data 1). These questions are designed to assess knowledge on different aspects of IYCF practices and the

question structure used targets a basic/low literacy adult learner reading level[5] which was appropriate for the CCs.

3.5 Results

2000 rural CCs from 8 districts were trained over a period of 5 months when the program was first implemented in Zimbabwe. An additional 93 CCs were trained between 2012 and 2013 from 7 other districts. A total of 966 CCs evaluated the cIYCF training. An average of 91% of the CCs evaluated all the training components as good, while an average of 0.2 % gave an unsatisfactory evaluation rating (Table 3.2).

The t-test comparison of the average knowledge scores for the districts at pre compared to post-test showed statistically significant differences ($P<0.05$) in 14 of the 15 districts analyzed (Table 3.3). Figure 2 reflects the trend in average knowledge scores of CCs presented by district at pre and post-test. Based on the ANOVA test there were no significant differences in the mean changes in knowledge scores from pre to post training among the 15 districts ($P=0.233$) implying similar changes in knowledge scores across districts.

Table 3.2: Training Component Evaluation of the Community IYCF Training by the Trained Community Counsellors

	Evaluation category					
Training Component	**Good (n)**	**% Good**	**Average (n)**	**% Average**	**Unsatisfactory (n)**	**% Unsatisfactory**

Training Objectives	895	92.7	19	2	4	0.4
Methods Used	882	91.3	24	2.5	1	0.1
Materials Used	887	90.9	44	4.6	1	0.1
Field Practice	850	88	67	6.9	2	0.2
Average	879	91	39	4	2	0.2

Table 3.3: Mean Comparison Test for Proportion of Correct Responses in Community IYCF Trained Districts (n=15)

District Code	**Percentmean pre-test correct respnses;[SD]**	**Percent mean correct response; [SD]**	**P-value**
001	(70) [0.1]	(100) [0.0]	0.000
002	(70) [0.1]	(90) [0.1]	0.015
003	(50) [0.2]	(80) [0.3]	0.006
004	(50) [0.3]	(70) [0.4]	0.034
005	(60) [0.1]	(90) [0.1]	0.002
006	(60) [0.1]	(100) [0.0]	0.025

District Code	Percentmean pre-test correct respnses;[SD]	Percent mean correct response; [SD]	P-value
007	(70) [0.0]	(90) [0.0]	0.000
008	(60) [0.1]	(90) [0.1]	0.000
009	(60) [0.1]	(90) [0.1]	0.002
010	(50) [0.2]	(80) [0.3]	0.008
011	(60) [0.2]	(90) [0.0]	0.003
012	(70) [0.0]	(90) [0.1]	0.002
013	(50) [0.3]	(70) [0.3]	0.104
014	(70) [0.1]	(90) [0.0]	0.004
015	(70) [0.1]	(90) [0.0]	0.003

3.6 Recommendations and future implications

Having implemented the UNICEF community IYCF training package in Zimbabwe with an indication of positive results on knowledge scores we recommend the adaptation and use of the package in other developing country settings. The package can be a useful tool to train CCs needed to bring about behavior change targeting IYCF at community level. However, the evaluation we have reported on only concentrated on knowledge scores which although an important component in training CCs do not necessarily mean

better counseling skills. Counseling skills were not evaluated but are a critical component in promoting IYCF behavior change. Furthermore when planning such a training program it would be vital to include a monitoring and evaluation strategy that addresses counseling skills in addition to knowledge scores and other quality assurance factors.

Although the post evaluation questions included 3 open ended questions by which the CCs were asked to indicate the most and least useful among the training sessions and suggest possible improvements for future trainings, this was not captured in the database we used. The pre/post test questions used represent different aspects of IYCF. It would therefore be useful to have a more in-depth analysis of the knowledge scores on individual questions because the questions on which few CCs got correct responses would reflect areas where IYCF practices may need additional attention. Incorporation of an evaluation of counseling skills pre, post training and after at least 6 months is recommended for similar training programs. Finally it would also be important to include elements to evaluate possible changes in IYCF practices and the extent to which this could be attributed to the training intervention.

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Chapter 4: MANUSCRIPT 2: COMMUNITY INFANT AND YOUNG CHILD FEEDING TRAINING IMPLEMENTATION IN RURAL ZIMBABWE: ANALYSIS AND RECOMMENDATIONS

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Submission Journal: The Journal of Remote and Rural Health (JRRH)

Section for Submission: Original Research

4.1 Abstract

Introduction

Taking infant and young child feeding (IYCF) training to community level was a new strategy implemented in Zimbabwe after the introduction of the UNICEF community IYCF counselling package in 2011. The package is a set of generic tools for programming and capacity development on community-based IYCF counselling. This package can be useful in providing skills on IYCF counselling services at community level where trained personnel have contact with mothers and infants/children, as well as their broad families. The training package comes with 15 brief pre- and post-test questions. The purpose of this research was to implement a retrospective analysis of the records from the pre- and post-test questions and identify areas where particular attention would be required to advise future training activities from the community IYCF training implemented in rural districts of Zimbabwe from 2011 to 2013.

Methods

Following a quasi-experimental design the authors used community IYCF training data from 19 districts representing a pool of 2093 trained village (community) health workers from several rural training centres. Sites were obtained from the Zimbabwe National Nutrition Department of the Ministry of Health and Child welfare. The authors applied mean comparison test statistics and ANOVA on proportion and percentage knowledge score changes. The knowledge scores were based on a same-set of 15 questions administered pre- and post-training.

Results

The authors used 88% of the retrieved data in the analysis. There were variations in the proportion knowledge scores ranging from 20% to 90%. The percentage knowledge scores were statistically insignificant for all the questions across the districts, except for question 8. Three main trends were observed, namely low, medium and high level trends. Special circumstances in the trends were also observed, particularly at question 9, and one training centre recorded a consistently low trend across several questions.

Conclusion

The UNICEF package is useful for training community-based health workers/volunteers in IYCF and the authors advocate similar or enhanced training evaluations to be able to address issues that require further attention.

Keywords: Community, education, generic tools, IYCF, knowledge scores, practices, pre- and post-test, rural area, training.

4.2 Introduction

Infant and young child feeding (IYCF) initiatives form part of strategies to address child survival and development[1]. This is well supported by scientific evidence, such as that documented in several Lancet series, for instance the child survival series of 2003, the new-born health series of 2005, the childhood development series of 2007, the nutrition series of 2008 and the maternal and child nutrition series of 2013. Evidence thus affirms the crucial role of optimum IYCF in achieving optimal child growth, development and survival. Studies looking at efficacy and effectiveness[1] have shown the usefulness of community-based approaches to improving breastfeeding and complementary feeding practices. However, for sustained achievement in child growth, development and survival through IYCF, there is a need for increased attention and commitment[1] to promoting optimum IYCF practices. One way of ascertaining success can be capacity development, taking advantage of the dependence of IYCF on social and behaviour change, especially when carried out at scale[1].

The importance of IYCF has been emphasised by the WHO/UNICEF from as early as 2003 in the global strategy on IYCF of 2013, which says:

> *Infants should be exclusively breastfed for the first six months of life to achieve optimal growth, development and health. Thereafter to meet their evolving nutritional needs, infants should receive safe and nutritionally adequate complementary foods while breastfeeding continues up to 2 years of age or beyond.*

In summary, this represents exclusive breastfeeding for the first six months and adequate complementary feeding from six months to two years. More recent literature has affirmed that breastfeeding promotion can have a large effect on survival, while education on complementary feeding has a positive effect on growth indicators in infants and young children[2]. The importance of IYCF has also been demonstrated by its prioritisation in the scaling-up-nutrition (SUN) movement[3]. The SUN movement is a high-level country-based coordinated effort, which focuses on the prioritisation of nutrition efforts within a country and mobilising resources from national and development partners to support the process. These nutrition efforts are based on proven nutrition interventions as recommended by the Lancet series, including IYCF being one of the main recommended nutrition strategies[3].

To address IYCF capacity development as a complementary process to implementing nutrition strategies related to IYCF, in 2009-2011 UNICEF developed and field-tested a generic community IYCF (cIYCF) counselling package for community-based workers[1]. This package covers nine components, as well as tools to support planning and adaptation at country level. In addition, the package covers behaviour change and counselling, supervision, monitoring and

mentoring. The materials are based on an adaptation of the WHO/UNICEF 2006 integrated IYCF counselling course, designed for workers of low literacy[1]. The UNICEF training package covers a broad range of concepts on IYCF, as shown in Figure 4.1. The concepts are covered using interactive adult learning techniques. The five-day training uses a participatory problem-centred training methodology, using interactive presentations, buzz groups, matching games, brainstorming, presentations, group work, demonstrations, role play and observations. Field practice using counselling cards, visual aids and case studies also forms an integral part of the training. Evaluation of the training is done through a set of 15 pre- and post-test questions addressing the materials covered. In addition, trainees are given a chance to evaluate the training processes[1].

Figure 4.1: Concepts covered by the UNICEF IYCF training package

- Breastfeeding
- Complementary feeding
- Maternal nutrition
- Latest guidelines on HIV/AIDS and infant feeding
- Infant feeding IYCF in emergencies
- IYCF in the context of severe-acute malnutrition

IYCF practices in Zimbabwe remain poor with respect to exclusive breastfeeding, adequate and appropriate complementary feeding and other key practices such as hygiene[4,5]. Under-nutrition remains a challenge, as evidenced by one in every three children being stunted[4]. Zimbabwe took advantage of the UNICEF cIYCF package to strengthen and scale up improved IYCF counselling at community level[5]. An IYCF technical working group was formed in early 2012 and 57 national level trainers were trained to facilitate scaling up of the training of community counsellors (CCs)[5]. The training package includes a same-set of 15 questions used to test the knowledge of the CCs on key IYCF practices pre- and post- training. Although over 2000 CCs were trained between 2011 and 2013, there has never been an evaluation of the training conducted. An evaluation of the data on the pre- and post-question knowledge scores is very important, as it could shed light on areas that may require additional follow-up activities. It can further provide information on specific IYCF practice areas that may require particular attention when proportions of counsellors giving correct responses are used as a proxy indication of cIYCF practice knowledge.

The aim of this quasi-experimental study was therefore to use existing records from the UNICEF cIYCF training to conduct an in-depth analysis of the pre-and post-test responses. The

researchers assessed the proportion of the trained CCs who gave correct responses to the 15 pre-post questions. They used the information on the proportion of counsellors giving correct responses to the 15 questions pre- and post-training, to identify specific areas of IYCF practices that may be particularly problematic to follow up. It is believed that this research project will provide useful information to the Ministry of Health and Child Care Nutrition Department of Zimbabwe and other implementers, on areas of IYCF practices that may need additional attention in the implementation of this training programme and follow-up activities.

4.3 Methods

4.3.1 Study design

The UNICEF training package includes 15 test questions that are used to test the participants' pre- and post-training. The study has used a retrospective programme implementation research approach in a quasi-experimental design to conduct an in-depth analysis of existing training records from the Ministry of Health Department of Nutrition cIYCF training programme on districts where cIYCF training is offered. The pre- and post-training test records for community-based cIYCF training sites in rural districts in Zimbabwe were analysed. An individual training site in a district was used as the sampling unit. The sample size of training sites was a convenient sample of 1840 trainees/CCs and 63 training sites where training was offered between 2011 and 2013 for which pre- and post-training test records were available. The rural districts included in the training programme by the Ministry of Health were selected based on high levels of malnutrition in the particular districts.

4.3.2 Implementation of the training programme

The first phase of the training programme involved training of trainers at national level[5]. The second phase involved the trained trainers providing training to CCs at district level centres[5].

At district level, typical training targeted at least six different training sites in which training was done simultaneously, with each site allocated to four trainers for the five-day training. Before and after the training the 15 tests questions that form part of the UNICEF training package were posed to the trainees. The true/false response options in the pre- and post-training tests were randomly distributed across the 15 questions to minimise the chances of correct responses occurring by chance.

The different sites in the district varied geographically and were selected to ensure that the entire district was covered. In addition, the selected geographic locations represented all the catchment areas naturally serviced by the local village health workers (VHWs). The trainees

were mainly VHWs, augmented by some community health volunteers and primary health-care nurses from nearby clinics.

The district health level where the cIYCF training was implemented is supervised by the provincial health administration, which ultimately reports to the national health structure. The districts where workers were trained were all rural ones, as reflected in the map (Annexure 4).

4.3.3 Trainee characteristics

The cIYCF training was mainly targeted at VHWs who provide health extension services at community level and are thus the agents for health promotion and disease prevention. They work in close co-operation with health centres. The health centres act as a hub for support in any health situations that the VHWs cannot handle and as a point of access for local capacity development. Since the VHWs were from the targeted communities, they had good knowledge of the communities they serviced. Each VHW serviced up to 100 households[5]. The training also included other community health volunteers who would normally be operating under the supervision of the VHW. Since the training was done in or close to a selected rural health centre, one of the primary health care nurses from the rural health centre also participated in the training.

4.3.4 Data collection and inclusion criteria for training sites and districts

For this study, the researchers accessed and analysed existing data on the pre- and post-training test responses to the 15 questions, from the Department of Nutrition, Ministry of Health. They used training sites in the districts where training had occurred as sampling units. The inclusion criterion was the availability of pre-and post-test results data for a site where training had been offered. For a district to be included it needed to have a minimum of two training sites on which data was available.

4.3.5 Data handling and analysis

The records at the Ministry of Health on the pre- and post-training questions were accessed. Using the training centres or sites as sampling units, the number of trainees giving correct responses per training site to the 15 true/false/I don't know pre- and post-test questions was recorded.

Figure 4.2: The pre-and post-test questions of the UNICEF cIYCF training

1. The purpose of an IYCF support group is to share personal experiences on IYCF practices.

2. Poor infant feeding during the first two years of life harms growth and brain development/

3. A child aged six to nine needs to eat at least twice a day in addition to breastfeeding.

4. A pregnant woman needs to eat one more meal per day than usual.

5. At four months, infants need water and other drinks in addition to breast milk.

6. Giving only information o a mother on how to feed her child is effective in changing her infant feeding practices.

7. A woman who is malnourished can still produce enough good quality breast milk for her baby.

8. The more milk a baby removes from the breast, the more breast milk the mother makes.

9. The mother of a sick child should wait until her child is healthy before giving him/her solid foods.

10. At six months, the first food a baby takes should have the texture of breast milk so that the young baby can swallow it easily.

11. During the first six months, a baby living in a hot climate needs water in addition to breast milk.

12. A young child (aged 6 up to 24 months) should not be given animal foods such as eggs and meat.

13. A newborn baby should always be given colostrum.

14. An HIV-infected mother should never breastfeed.

15. Men play an important role in how infants and young children are fed.

*Source: The UNICEF community IYCF training facilitator guide (2012)

The proportions of trainees giving correct responses pre- and post-training were also computed separately. The computation of each of the variables described above was done for each of the 15 test questions separately for more meaningful interpretation with respect to the related feeding practices. The variables were tested for normality and found to be normally distributed. Descriptive statistics were computed on proportions giving the correct responses pre- and post-training and the percentage change in proportions giving correct responses by district and province. The mean frequencies (standard deviation) of the proportions giving correct responses pre- and post-training were reported by question. The observed patterns of the frequencies of proportions giving correct responses were plotted to reflect different trends observed pre-and post-training by district with respect to IYCF practices represented by individual questions. In addition, the researchers carried out paired mean comparison t-tests of pre- and post-test proportion changes. Analysis of variance (ANOVA) was used to compare the percentage change in proportions giving correct responses by district and province. Where differences were observed, least square difference post hoc analyses were done to determine which districts or provinces were significantly different. A $p<.05$ was used for statistical significance. The statistical package SPSS (v. 17.1) IBM, 2013 was used for all statistical analyses.

4.3.6 Ethics approval

This project received approval from the Ministry of Health and Child Welfare Permanent Secretary of Zimbabwe on 19 December 2012 and from the Faculty of Health Sciences Research Ethics Committee at North-West University (approval number NWU-00084-13-S1). Further approval was obtained from the Medical Research Council of Zimbabwe (MRCZ approval number MRCZ/B/568).

4.4 Results

4.4.1 Community counsellors trained

According to the records obtained, training was offered in 82 rural training sites to 2093 community-based health workers from 19 districts, using the UNICEF cIYCF package (Table 4.1).

Table 4.1: Distribution of community counsellors trained in the cIYCF, numbers of districts and provinces (2011-2013)

Category	Distribution				Training Areas/Sites		
	Village Health Workers (n)	Other Community-based Volunteers(n)	Primary Health Care Nurses (n)	Total Trained	District-level training sites (n)	Number of Dis-tricts	Number of Provinces
Total number trained retrieved	1877	105	111	2093	82	19	7
Total number included in analysis	1658	88	94	1840	63	13	7
Percentage of retrieved included in analysis	88	84	85	88	77	68	100

4.4.2 Analysis of variance for percentage changes in proportion of giving correct responses for questions by district and province

ANOVA of percentage changes in correct responses was computed by district and province. This is reflected in Table 4.2 and Table 4.3 respectively. At district level there was no significant difference in the percentage change in correct responses, except for question 8 ($p>0.05$). Based on post hoc tests, differences were observed, for example between Binga and Lupane, Gokwe South, Gokwe North and Gwanda districts, as shown in, Table 4.2. Similar observations were made at the provincial level where a statistical difference occurred only at question 8 ($p>0.05$). The results of post hoc analyses at provincial level are also reflected in Table 4.3, with differences observed between Matebeleland province and the other six provinces.

Table 4.2: ANOVA and post hoc results on mean changes in percentage of correct responses pre- to post-training by district

Question number	§D1 mean (SD)	§D2 mean (SD)	§D3 mean (SD)	§D4 mean (SD)	§D5 mean (SD)	§D6 mean (SD)	§D7 district mean (SD)	§D8 mean (SD)	§D9 mean (SD)	§D10 mean (SD)	§D11 mean (SD)	§D12 mean (SD)	§D13 mean (SD)	p-value
1	10.3(12.5)	25.9(8.6)	1.9(2.6)	14.0(11.1)	15.0(16.4)	0.84(5.3)	10.6(11.7)	10.2(7.0)	5.6(6.4)	5.7(13.7)	6.3(4.4)	17.4(10.3)	10.7(2.6)	0.11
2	12.1(10.2)	15.9(10.6)	8.2(1.2)	10.5(10.5)	9.9(16.6)	4.9(14.8)	13.4(12.7)	13.2(0.2)	10.3(12.6)	24.8(32.6)	9(5.5)	28(26.4)	13.6(10.7)	0.617
3	26.4(17.4)	38.6(17)	9.3(13.1)	15.8(10.8)	21.7(19.6)	14.6(15.4)	24(15.6)	21.7(15)	10.9(15.6)	15.4(16.9)	27.9(16.3)	27.1(16.3)	28.6(22.2)	0.419
4	42.7(20.8)	26.5(47.4)	25.4(41.2)	35.2(11.3)	37.3(32.5)	28.8(17)	43.8(10.5)	13.9(27.5)	13.5(15.6)	45.8(31.2)	30.1(14.9)	54.6(9)	36.3(10.6)	0.326
5	12.1(10.7)	21.4(2.4)	12.8(7.6)	16.8(10)	20.1(23.2)	13.4(11)	-7.3(30.6)	19.4(14.3)	15(12.1)	5.1(6.6)	19.2(31.7)	5.1(8)	26.4(12.3)	0.321
6	54.2(24.1)	42.9(32)	35.4(18)	64.6(31.3)	73.8(20.4)	60.5(30.7)	57.1(24.5)	76(13.4)	38.9(29.5)	25.3(47.6)	57.7(40.3)	36.4(46.4)	44.8(42.3)	0.479
7	63.8(16.1)	84.8(14.1)	61.4(3.1)	67.0(30.2)	72.7(18.9)	51.9(34.7)	52(30.8)	66.3(20.7)	59.4(41)	63(27)	75.3(14)	80.5(11.6)	79.9(15.5)	0.635
8	15.2(9)a	39.1(22.1)^{b,a}¶	12(4)^{b,a}	16.3(14.7)^{b,a}	14.4(14.8)^{b,a}	3.5(2.7)^{b,a}	11(15.1)^{b,a}	32.1(20.2)^{b}	15.1(10.8)^{b,a}	20.8(19.2)	34.2(14.8)^{b}	38.9(16.7)^{b}	36.9(21.8)^{b}	0.004*
9	23.2(29.4)	46.3(27.7)	1.4(8.5)	21.4(19.3)	12.6(21.7)	19.6(25.3)	24.5(13.8)	8(10.5)	43.3(34.4)	20.7(5.7)	14.1(10)	26(42)	33.4(21.1)	0.458
10	56.9(25.2)	74.5(6.2)	39.6(40.4)	69.4(28.1)	75.1(14.7)	53.5(36.6)	33.9(53.9)	61(21.3)	49.8(34)	72.8(13.2)	76(15.7)	72(14.2)	77.2(7.1)	0.273
11	28.5(22)	53.6(31.5)	19.2(11.4)	29.5(22)	25.3(10.9)	18.1(15.9)	27(11.2)	31.4(27.4)	18(16.1)	6.3(57.1)	20.8(14.5)	27.9(38.3)	25(16.1)	0.703
12	18(9.1)	28.1(15.4)	18.8(5.6)	14.9(7.8)	13.5(16.2)	7.1(7.5)	15.1(14.7)	11.3(18.6)	14.3(11.4)	17.6(18.2)	21(30.2)	24.6(32.1)	32.8(11.1)	0.806
13	4.8(3.2)	22(12.1)	1.9(2.6)	10.2(14.4)	9.4(17.5)	2.7(1.8)	14.3(10)	8.8(7.6)	11.3(8.4)	3.2(6.4)	10.3(24.1)	10.7(11.4)	14.5(4.8)	0.655
14	15.3(14.9)	5.4(40.3)	25.6(15.2)	14.8(12.3)	15.0(20.3)	23.5(40.6)	21.9(7.5)	13.9(7.6)	14.2(11.8)	20.1(9.8)	13.5(9)	21.6(23)	16.4(18.3)	0.988
15	37.7(26.6)	27.1(9.9)	50.5(7.1)	17.9(16.8)	29.7907(29.8)	17.5(15.8)	14(9.8)	22.4(7.2)	22.4(18.3)	20.8(18.2)	25.4(18.3)	25.9(12.2)	46.4(28.7)	0.316

§The names of the districts were: D1-District 1, D2-District 2; D3, District 3;D4,District 4;D5,District 5;D6,District 6;D7 District 7;D8 District 8; D9,District 9;D10,District 10;D11,District 11;D12,District 12,D13,District 13.

a, b within a row with unlike superscript lower case letters were significantly different (P<.05)

Note: Paired t-tests were used to compare percentage changes in correct responses.

Table 4.3: ANOVA and post hoc results on mean changes in percentage knowledge scores pre- to post-training by province

Questions numbers	§P1 mean (SD)	§P2 mean (SD)	§P3 mean (SD)	§P4 mean (SD)	§P5 mean (SD)	§P6 mean (SD)	§P7 mean (SD)	P-value
1	15.1(13.4)	1.9(2.6)	12.1(13.4)	10.5(9.6)	6(7.7)	14.9(8.6)	9.6(12)	0.321
2	13.2(10)	8.2(1.2)	10.8(13.7)	13.3(9.6)	13.9(18.6)	22.6(22)	2.8(7.9)	0.455
3	30.2(17.6)	9.3(13.1)	17.8(15.5)	23.1(14.3)	19.5(16.9)	27.7(17.1)	15.8(11.2)	0.291
4	37.7(30.2)	25.4(41.2)	35(22.1)	32.6(22.8)	29.9(23)	47.7(13)	32.8(13.6)	0.728
5	15(9.9)	12.8(7.6)	17.6(16.6)	2.7(28)	14(21.6)	13.1(14.2)	15.1(6.6)	0.694
6	50.7(26)	35.4(18)	68.5(28.1)	64.2(22.1)	43.1(39.3)	39.6(42)	59.8(24.1)	0.241
7	70.3(18)	61.4(3.1)	64.2(30.6)	58(26.7)	67.2(26.2)	80.3(12.1)	70.8(13.7)	0.647
8	22.6(17.6)[b]	12(4)[b]	14.2(14.4)[b]	19.5(18.8)[b]	25(16.5)[b]	38.2(17.2)[a]	8.5(10.3)[b]	0.028[*]
9	30.3(29.9)	1.4(8.5)	19.7(21.9)	18.3(14.6)	24.3(21.9)	28.8(33.9)	12.9(15.2)	0.615
10	62.3(22.4)	39.6(40.1)	65.9(29.1)	44(44.6)	67.6(23.2)	73.9(11.7)	75.4(11.7)	0.251
11	36.2(26.8)	19.2(11.4)	28(19.2)	28.7(17.1)	15.8(30.6)	26.8(30.2)	17.7(6.1)	0.499
12	21.2(11.8)	18.8(5.6)	12.8(12.3)	13.6(15)	18.1(21.6)	27.7(25)	13(2.9)	0.488
13	10.1(10.6)	1.9(2.6)	9.1(15)	12.2(9)	8.6(16.2)	12.1(9.2)	5.8(7.7)	0.927
14	12.2(24)	25.6(15.2)	18.1(23.8)	19(8.1)	15.6(9.7)	19.7(20.1)	11.3(11.6)	0.921
15	34.4(22.9)	50.5(7.1)	23.5(22.7)	17.1(9.4)	23.2(16.9)	33.5(20.8)	14.6(13.3)	0.129

The names of the provinces were: **§**P1,Province 1; P2,Province 2; P3,Province 3;P4,Province 4;P5,Province 5;P6,Province 6;P7,Province 7.

a, b within a row with unlike superscript lower case letters were significantly different (P<.05) Note: Paired t-tests were used to compare percentage changes in knowledge scores

4.4.3 Trends in proportion of trainees giving correct responses

Trends on proportions of CCs giving correct responses were analysed graphically by plotting districts as separate points on the graphs for each question. Three main trends were observed from the graphs. Additional figures reflecting trends for the rest of the questions are given in Annexure 5.

The first trend, A, was for questions where the proportion of correct responses at pre-test was relatively low, exemplified by question 6 at pre-test with a mean (SD) of 0.2 (0.2) thus relatively low to start and reaching a mean (SD) of 0.7 (0.3) at post-test (Figure 4.3). Other questions reflecting a trend similar to question 6 were questions 7 and 10.

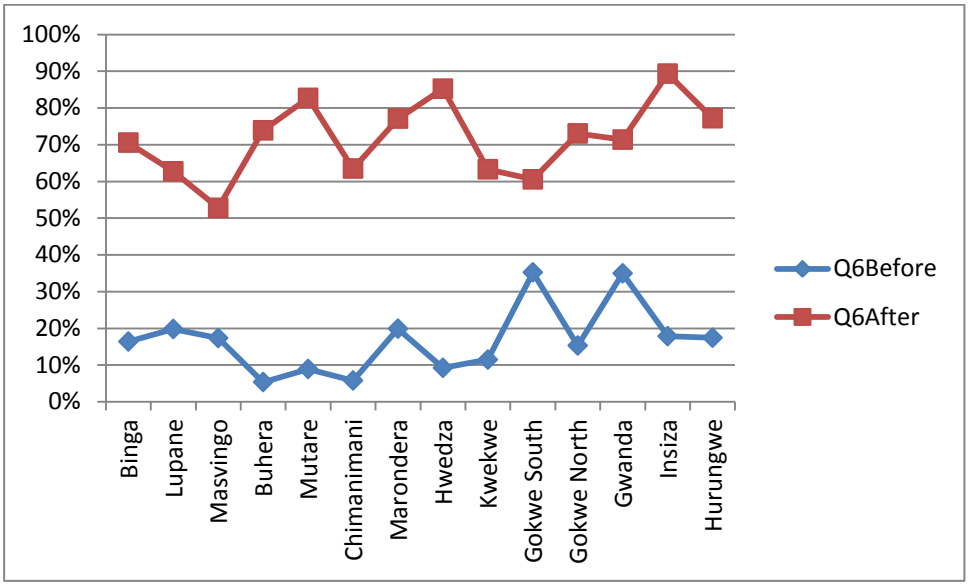

Figure 4.3: Trend A- - observed proportion of trainees giving correct responses reflecting relatively low-medium for pre- (20%) and post- (70%) training scores plotted for districts: Example, Question 6

A second trend, B, was noticed for questions where the proportion of correct responses at pre-testing was on medium level, exemplified by question 4 at pre-testing with a mean (SD) of 0.5 (0.2), thus close to the middle to start and reaching a mean (SD) of 0.9 (0.2) at post-testing (Figure 4.4). Other questions reflecting a similar trend to question 4 were questions, 9, 11 and 15.

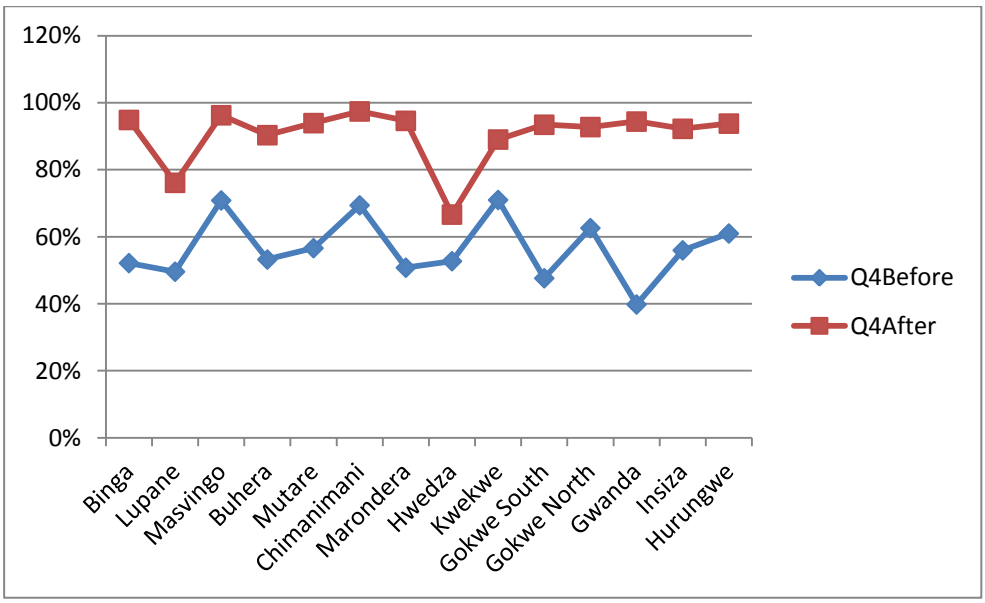

Figure 4.4: **Trend B - Oobserved proportion of trainees giving correct responses reflecting relatively medium for pre- (50%) and post- (90%) training scores plotted for districts: Example,Question 4**

The third trend, C, was for questions where the proportion of correct responses at pre-testing was relatively high, exemplified by question 1 at pre-testing with a mean (SD) of 0.8 (0.2), thus relatively high to start and reaching a mean (SD) of 0.9 (0.1) at post-testing (Figure 4.5). Other questions reflecting a similar trend to question 1 were questions, 2, 3, 5, 8, 12, 13 and 14.

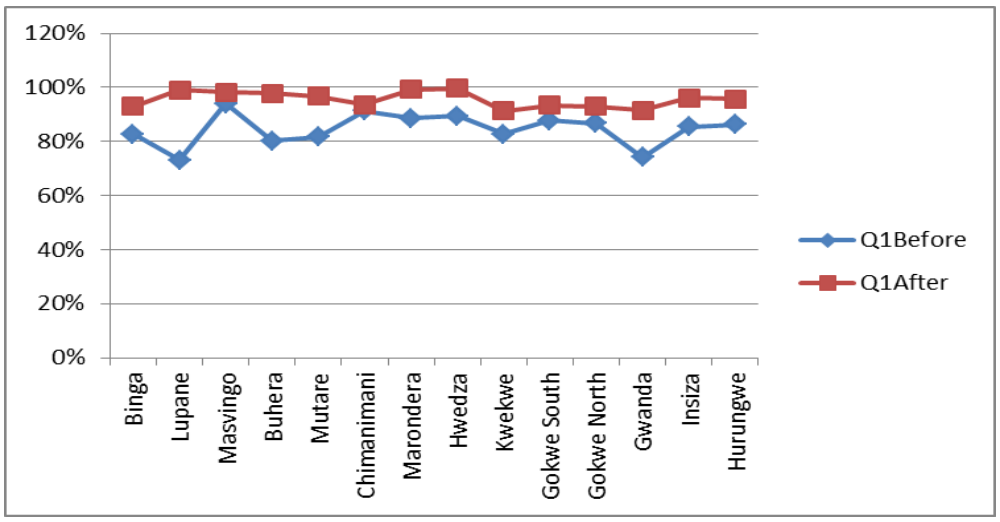

Figure 4.5: Trend C, - observed proportion of community counsellors giving correct responses reflecting relatively high for pre- and post-training scores plotted for districts (Question 1)

In addition to these trends, the researchers observed special circumstances. For instance, looking at the trends across all 15 of the questions, Chimanimani district had the peculiarity of doing poorly after training on eight out of the 15 questions (Annexure 5). A second special circumstance was a situation where the performance was relatively low at post-testing, for example, the situation observed at question 5 for Marondera district centre (Figure 4.5).

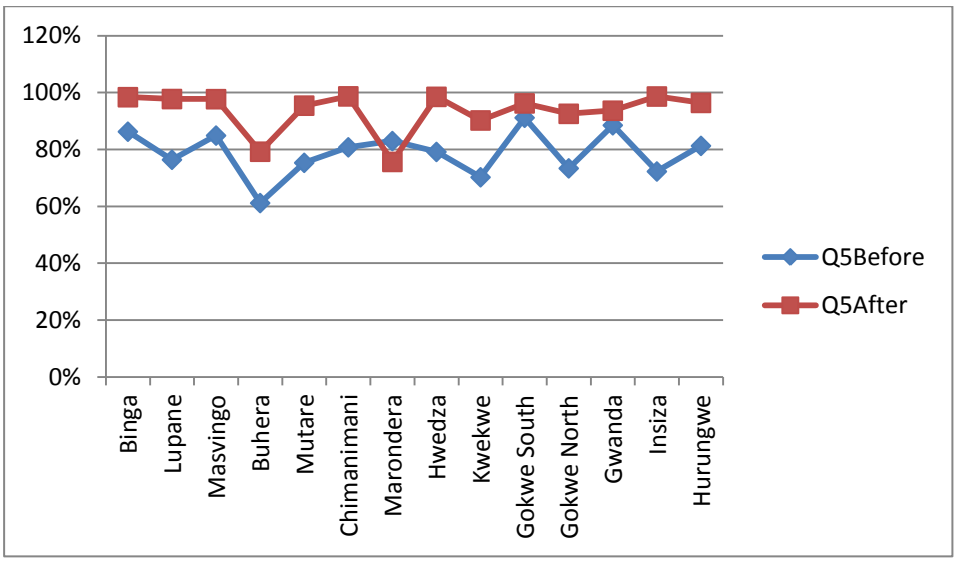

Figure 4.6: Special circumstances where the post-test mean score remained relatively unchanged after training (e.g Marondera district)

4.5 Discussion

The objective of this study was to conduct in-depth analysis of the pre- and post-test correct responses from the existing records of the Ministry of Health and Child Care/Welfare. In addition the researchers sought to look at specific IYCF areas that might require additional attention from the analysis and ultimately to formulate recommendations. The study forms the first retrospective implementation research for Zimbabwe that has analysed the pre- and post-test records of this training programme to inform follow-up activities and future training efforts. To the knowledge of the researchers this is the first time such an in-depth analysis of the pre- and post-training questions of the UNICEF training package has been done.

The study emphasises the importance of not only keeping records of such evaluations of training interventions, but most importantly making use of the records to inform follow-up activities to direct progress. Although all training sites administered the pre- and post-training tests, the researchers were only able to include 88% of the records in the analysis because of records not being available for all training. Being able to access these records is important to gain insight into the areas that may need further attention after the training, as will become clear in this discussion. A report[6] on ten case-study countries reinforces the importance of keeping records and making analyses in order to take lessons. This is depicted in one of the key findings, which mentions the importance of collection and analysis of data, as these affect approaches and allow amendments to be made[6].

A general trend towards an increase in the proportion of CCs who gave correct responses to all 15 questions was observed at the post-test stage. This implies a possible positive effect of the training on IYCF knowledge. The graphical analysis of pre- and post-training proportions also reflects this trend. When ANOVA was done on the percentage change in correct responses, significant differences were only observed at question 8, both by district and province. This situation probably reflects differences in knowledge based on the IYCF practice addressed by question 8 across trained districts/provinces, unlike the other questions. The observed changes in knowledge responses could form a basis on which behaviour change communications by the trained counsellors could be leveraged. A recent review on the nutrition implementation framework and research agenda emphasised the need for use of community-based platforms and especially working with community workers for promoting behaviour change communication[7]. Another systematic review[8] of complementary feeding reiterates the importance of increasing capacity at community level as a strategy for having sustained optimum IYCF practices[8].

The different trends observed, A, B and C, on the proportion of trainees giving correct responses are important, as they give some insight into the proxy knowledge base on the specific question items with respect to IYCF practices in the communities served by the trained trainees. These trends would suggest a different knowledge base of the trainees on the IYCF practices reflected by the different questions. This insight would not be possible to observe if only the percentage change in knowledge scores had been taken into account, as these only give a global view of the situation. The graphical analyses done can help provide useful information that could be missed if a global view is taken. The different trends observed could, for example, be used to identify practices where the suggested knowledge base may need additional intervention. Thus, using the knowledge scores of the trainees prior to training as a proxy indication of the possible knowledge base in the communities they serve, Trend C (Fig 6) would reflect a situation where the knowledge base for the feeding practices reflected by the questions depicting this trend (question 6, 7, 10) is rather low. For question 6 this could be an indication of a belief that giving information/education only is effective in improving IYCF practices in communities. This observation would signify limited appreciation of the need to demonstrate the desired practices practically to mothers/community members.

Although in this research the researchers do not assess behaviour change, the UNICEF community IYCF training could be useful to bring about behaviour change, this being one of the main strategies of the training package. The extent to which behaviour change could happen, however, needs to be investigated using appropriately designed research.

If the same proxy situation as above is applied in the same way to question 7, which addresses the effect of malnutrition on the quality of breast milk a woman can produce, the observed trend towards low scores before training suggests the view that a malnourished woman may not produce good quality breast milk. The UNICEF training[1] has a session that addresses the fact that even malnourished mothers can produce good quality breast milk, with strong emphasis on increased breastfeeding frequency[1]. The proportion of trainees giving correct responses to this question went from a mean of 20% before training to 90% after training (P =0.000). The lack of a control group in this study design limits the extent to which the researchers can attribute this change and similar changes related to the other questions in test scores to the training. The trend across all 15 questions, however, is towards higher test scores for all 15 questions, suggesting the training may be a factor in these observations.

The analyses of retrospective data explored in this study suggest that use of the UNICEF cIYCF training package has the potential to influence the knowledge scores of trainees. The changes in knowledge scores observed can be attributed to the adult training methodologies in the form of highly participative group discussions used by the UNICEF package. A study by Pogge[11] showed that an education programme that involved more participation and discussion was very favourable for training adults[11]. In this study, after participants had been given an average of 15 minutes to engage in discussion in a training programme, they still stated that there was not enough discussion in the programme[11]. Community-based counsellors like the ones trained in the programme reported on are front-line staff upon whom the qualities of behaviour change communication depends[7]. Influencing their knowledge through this type of training is an important way of influencing the knowledge base to improve their ability to counsel the community members they serve more effectively. A review of interventions to reduce malnutrition in developing countries emphasised the importance of equipping the message-carriers (frontline/community-workers) to influence communities with the right knowledge[12]. However, the researchers cannot say for sure if the attained knowledge scores after the training reported on would necessarily have resulted in changes in the quality of messages CCs transmit in counselling community members. This is because what has been analysed is simply immediate changes in knowledge scores. In subsequent similar training programmes the researchers recommend including a component where the quality of messages transmitted after training is also assessed.

The lack of a statistical significant difference among the changes in correct responses among districts and provinces reflects similar changes in correct responses for questions among districts and provinces. The implication is that the UNICEF training package in this setting could yield similar results across diverse districts and provinces. The significant differences observed with respect to question 8 point to valuable insight in terms of knowledge among trainees on the

feeding practice concerned. Question 8 was, "*The more milk a baby removes from the breast, the more breast milk the mother makes*"; reflecting the trend for question 8 shows a diverse range of knowledge scores at pre-testing, which may be responsible for the differences observed. This is confirmed by the post hoc analysis.

If the knowledge scores of the trainees are taken as a proxy indication of the community knowledge base on the related feeding practice addressed by Question 8, the observation would indicate that while in some settings there may be knowledge that the more a baby suckles the more milk the mother produces, this may not be the case in some district settings. A UNICEF six-country review[9] found cultural beliefs that women cannot produce enough breast milk and this can influence early introduction of other foods. This belief may also be prevalent in Zimbabwe, hence the differences observed between districts, especially with respect to Question 8. The physiology of milk production is supportive of the stimulatory role of breastfeeding on the amount of milk produced[10]. The hormone prolactin stimulates milk production, while milk removal as in breastfeeding also plays an important role in determining the amount of milk produced[10]. The understanding of the importance of breast milk removal as a stimulator for breast milk production can even help to address concerns about low breast milk supplies among lactating mothers.

The researcher's observations in this study emphasise the need to pay additional attention to particular feeding practices that would need closer attention at follow-up, such as those where the knowledge scores may have been relatively low before training and after training (e.g. questions 6, 7 and 10). In addition the observations point to the need to examine the peculiarities of particular districts. For example, the Chimanimani district had the peculiarity of having relatively low sores on many of the questions after training. It would be important to follow up such a district to assess the quality of counselling messages and provide follow-up training as needed.

In general the findings have shown that the UNICEF training package may have contributed to a change in knowledge scores among the trained CCs. Analysis of the pre- and post-test records can give useful insight into feeding practices that may need further attention after the training process. Making use of this training package can potentially help to address unsupportive knowledge trends related to IYCF practices such as were documented by Nasreddine, e.g. mixed breast and bottle feeding in the first six months, early introduction of non-milk fluids and early introduction of complementary foods[14] .

This study has some limitations. The quasi-experimental design the researchers used classically does not include a control group, thus requiring caution with the interpretation of the results. Furthermore, any changes in knowledge scores cannot necessarily be extrapolated to

practice, as this was not assessed. Hence the researchers call for further investigations in this area to determine the extent to which the change in knowledge scores of the CCs would influence behaviour change in the communities served. The quasi-experimental design used can nonetheless provide useful information in programmes. The study provides a valuable way of analysing the pre- and post-training knowledge scores of the UNICEF training package. The analysis could follow up the districts where CCs had been trained to address the issues raised by trends observed across the 15 questions and districts where the training was implemented in Zimbabwe.

4.6 Conclusion

The researchers demonstrate the value of analysing the records of the pre- and post-training tests of the UNICEF training package to gain insight on feeding practices where additional attention may be required. The authors observed different trends in the proportions of trainees giving correct scores that may have implications for the knowledge base on specific IYCF practices in the communities served by the trained counsellors. The researchers recommend a concerted effort to analyse similar training records where such training has taken place and that those planning to use this package should build the analysis of the records into the implementation process. They further recommend specifically designed follow-up of the CCs after training to ascertain the desired change in IYCF practices.

As follow-up areas the researchers identify questions 6, 7 and 10 where there were particularly low pre-training scores as problematic areas. They particularly recommend the need for re-orientation training at training centres where there were repeated low knowledge scores across the questions, such as Chimanimani.

4.7 Acknowledgements

The researchers acknowledge the Ministry of Health, Nutrition Department of Zimbabwe for allowing access to the training records. They further acknowledge the enthusiasm with which the importance of analysing the pre- and post-tests of the cIYCF training programme was regarded.

The outcome of this study will be prepared as a report for presentation to the Ministry of Health and Child Welfare, Department of Nutrition Zimbabwe and the researchers trust it will be useful in informing follow-up activities for the community IYCF programme in Zimbabwe.

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Chapter 5: GENERAL SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

The aim of the study was to use a quasi-experimental design to carry out implementation research involving a retrospective analysis of training records of training that was done in Zimbabwe using the UNICEF community IYCF training package from 2011 to 2013. The literature review in Chapter 2 reported literature information on IYCF and established that community-based interventions have an important role to play in the behaviour change required to bring about appropriate and adequate IYCF practices. The UNICEF training package for community-based counsellors was described as a package that can be used to train CCs. Although Zimbabwe and other countries have used the package to train CCs, no evidence was found of any analysis having been done of the 15 pre- and post-training test questions and evaluation records. The pre- and post-test questions reflect on specific IYCF practices and an analysis of how CCs' knowledge displayed in the 15 pre- and post-test questions would give insight into IYCF practices that may need additional follow-up and/or attention.

The researchers retrieved existing training records of the pre- and post-test results and analysed the proportions of the CCs who gave correct responses to the tests. In Chapter 3 the UNICEF training package was presented as an example of great education material in a manuscript submitted to the JNEB under the special GEMS category of the journal. It was recommended that the package be used for training counsellors in other developing settings. Information on the evaluation of how the CCs experienced the training process and objectives was also reported, indicating mostly positive experiences. However, the need to conduct in-depth analysis of the pre- and post-training test records to inform follow-up and direct progress was highlighted. In Chapter 4 therefore, a manuscript based on an in-depth analysis of the pre- and post-training test records was presented. It is due for submission to the Journal of Remote and Rural Health.

5.2 Main findings and conclusions

The findings from the study uncover a number of interesting observations from analysing the proportions of CCs who gave correct responses to the pre-post training test questions and end-of-training evaluations of the UNICEF community IYCF training package. Firstly, the researchers determined that a large number (91%) of trainees evaluated all the training components as good, despite having received the training in different training centre environments in diverse districts across the country. Secondly, there was a larger proportion of

CCs obtaining correct responses at post-testing for all the questions ($p<0.05$). Lastly, the researchers observed varying trends on the proportion of CCs obtaining correct responses for pre- and post-testing. Analyses of these trends can then be useful for identifying IYCF practice areas that might need additional attention in follow-up activities to direct progress. Specifically, the following possible problematic area was identified:

> Lack of knowledge of the fact that the more milk a baby removes from the breast the more milk a mother will make.

In conclusion, the researchers believe this research project provides useful information not only to the National Nutrition Department of Zimbabwe but also to others who wish to use this training package. It gives an example of what can be done with the records of the pre- and post-training tests to gain insight into areas of IYCF practices that may need additional training when the training programme is implemented. Furthermore, the analysis has provided information on possible differences in trends observed across different districts on individual questions for districts where the training was implemented. This can facilitate the planning of re-orientation training or general support and mentorship for CCs in the given areas.

5.3 Recommendations

The recommendations based on this research are divided into firstly, general recommendations and secondly, specific recommendations for the case of Zimbabwe.

5.3.1 General recommendations:

1. The UNICEF community IYCF training package can be applied in different set-ups or environments, particularly in rural communities, and will yield similar results.
2. Analysing the pre-training test results can give a proxy indication of the existing knowledge base of the targeted CCs and such analyses are strongly recommended when the UNICEF community IYCF training programme is being implemented.

5.3.2 Specific recommendations for Zimbabwe:

1. We recommend re-orientation training, especially for Chimanimani and Marondera districts, looking especially at the graphs for the individual questions in Annexure 5.
2. There is a need for a support and supervision structure to provide monitoring and evaluation in all the districts where CCs were trained in the community IYCF programme to ensure meaningful follow-up that can address the issues raised by the evaluation and/or analyses of training records, as has been done in this research study.

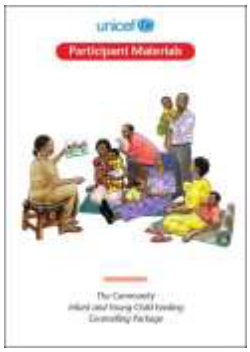
Annexure 1: Supplementary material 1

1. Planning and adaptation guide

2. Facilitator guide

3. Training aids

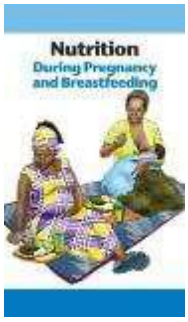
4. Participation materials and adaptation guide



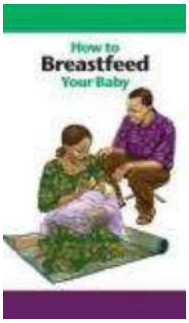
5. Counselling cards (28)

6. Key messages booklet (for the cards)

7. Brochure: Nutrition during pregnancy and breastfeeding



8. Brochure: How to breastfeed your baby



9. Brochure: How to feed a baby after 6 months

UNICEF Community Infant and Young Child Feeding Package, http://www.unicef.org/nutrition/index_58362.html

Annexure 2: Supplementary material 2 components covered

Trainees will be able to:

1. Explain why IYCF practices matters,
2. Demonstrate appropriate use of counselling skills (listening and learning, building confidence and giving support - practical help) and ability to use the set of IYCF counselling-cards.
3. Use the IYCF three-step counselling skills (assess, analyse and act) with a mother, father or other caregiver.
4. Describe recommended feeding practices through the first two years of life.
5. Describe how to breastfeed.
6. Identify ways to prevent and resolve common breastfeeding difficulties.
7. Describe practices for feeding the sick child and the child with acute malnutrition.
8. Facilitate action-oriented groups and IYCF support groups.
9. Relate women's nutrition to life cycle.
10. Describe basic information on infant feeding in the context of HIV.
11. List how and when a child should receive counselling follow-up.
12. Identify signs that require referral to a health post.
13. Highlight key issues related to infant feeding in emergencies and apply the knowledge and skills to support IYCF in an emergency context.

UNICEF Community Infant and Young Child Feeding Package,
http://www.unicef.org/nutrition/index_58362.html

Annexure 3: Supplementary material 3 - The 15 pre-/post-questions

Question No	Pre/Post-test question
1	The purpose of an IYCF support group is to share personal experiences on IYCF practices
2	Poor infant feeding during the first two years of life harms growth and brain development.
3	A child aged six to nine months needs to eat at least twice a day in addition to breastfeeding.
4	A pregnant woman needs to eat one more meal per day than usual.
5	At four months, infants need water and other drinks in addition to breast milk.
6	Giving only information to a mother on how to feed her child is effective in changing her infant feeding practices.
7	A woman who is malnourished can still produce enough good quality breast milk for her baby.
8	The more milk a baby removes from the breast, the more breast milk the mother makes.
9	The mother of a sick child should wait until her child is healthy before giving him/her solid foods.
10	At six months, the first food a baby takes should have the texture of breast milk so that the young baby can swallow it easily.
11	During the first six months, a baby living in a hot climate needs water in addition to breast milk.
12	A young child (aged 6 up to 24 months) should not be given animal foods such as eggs and meat.
13	A newborn baby should always be given colostrum.
14	An HIV-infected mother should never breastfeed.
15	Men play an important role in how infants and young children are fed.

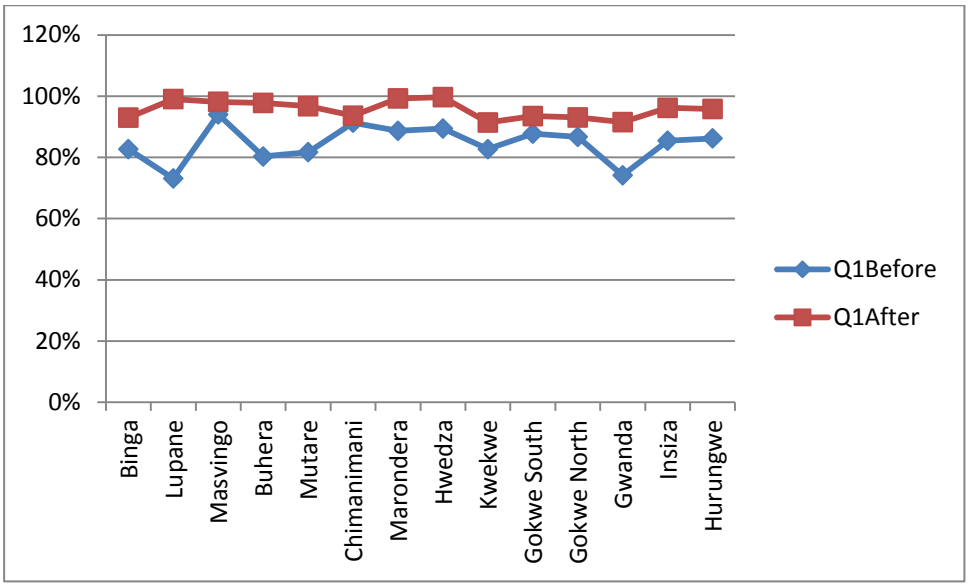
UNICEF Community Infant and Young Child Feeding Package,
http://www.unicef.org/nutrition/index_58362.html

Annexure 4: District Map of Zimbabwe

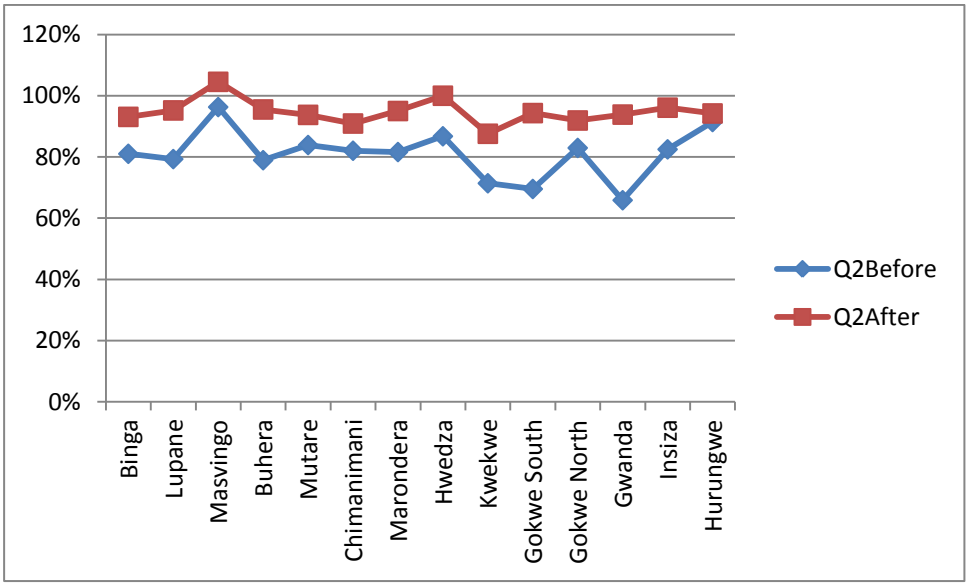
Google Maps, 2014

Annexure 5: Additional Graphs on IYCF trainings by Question

QUESTION 1



Question 2



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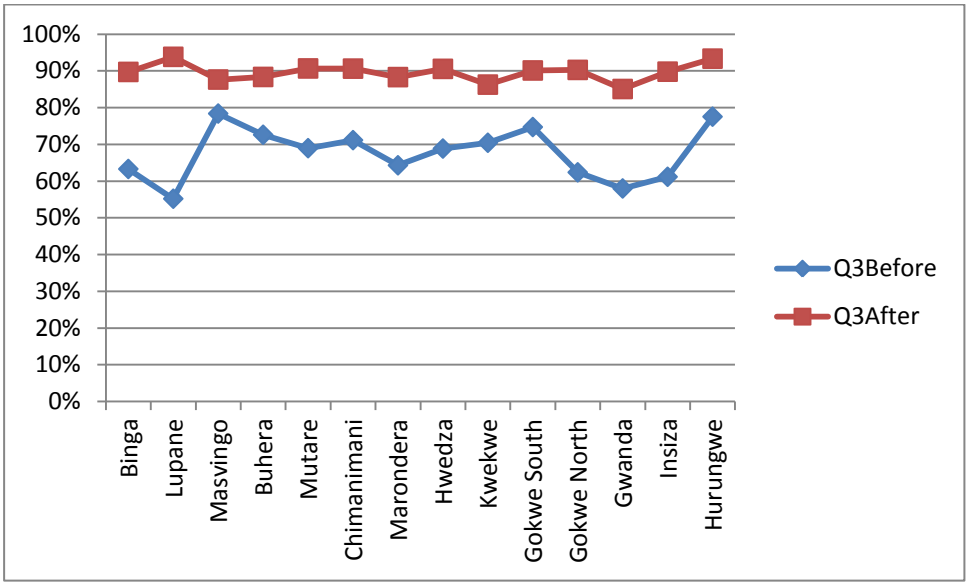
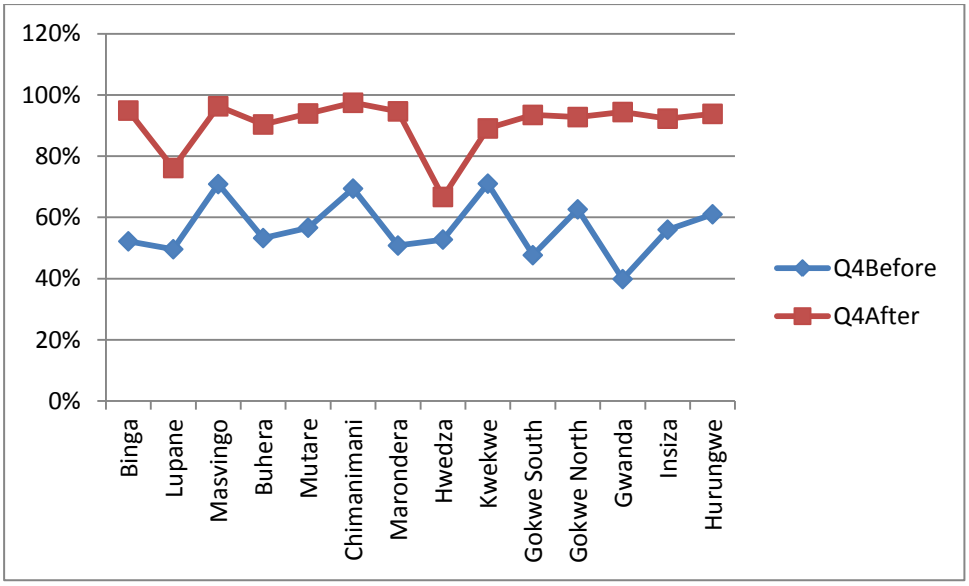


Question 4



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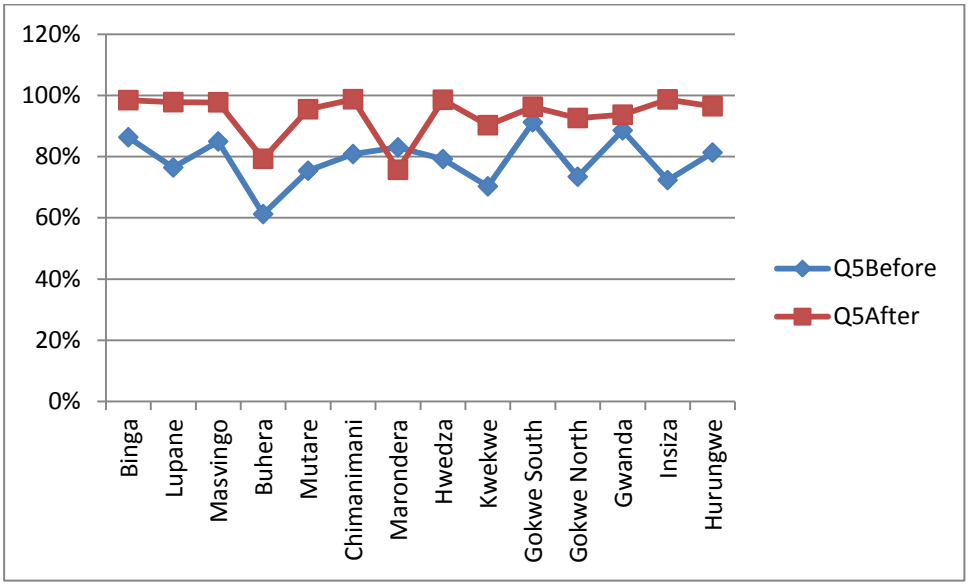
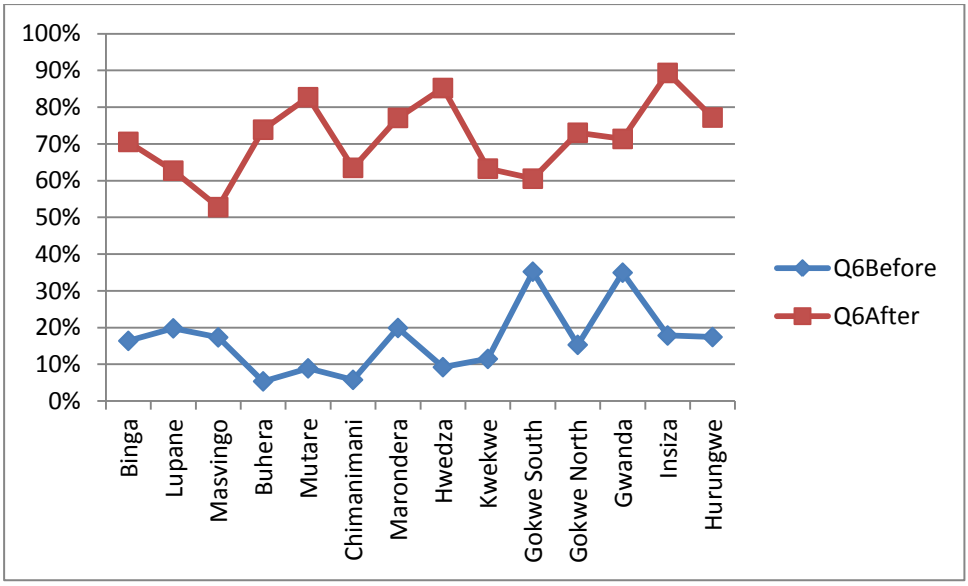
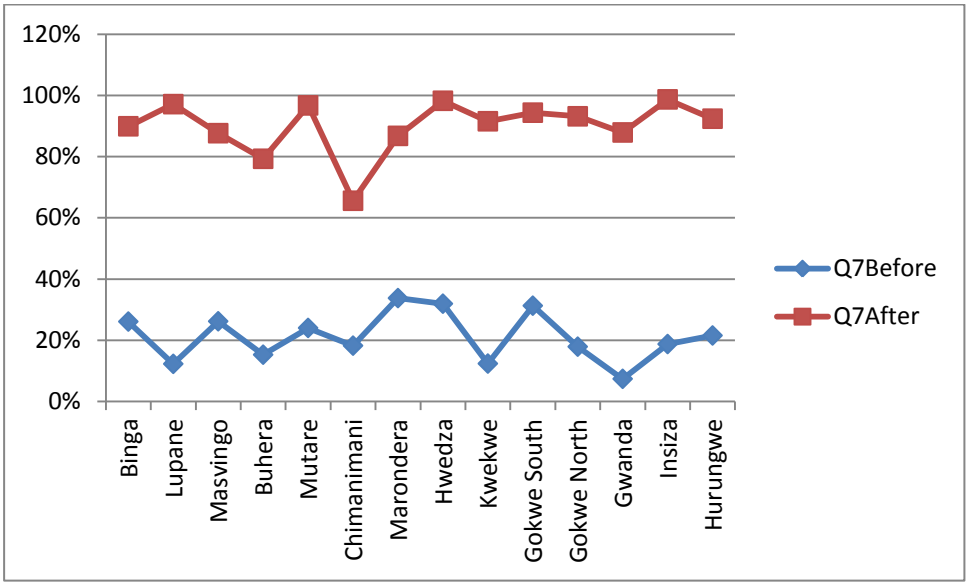


Question 6



Question 7



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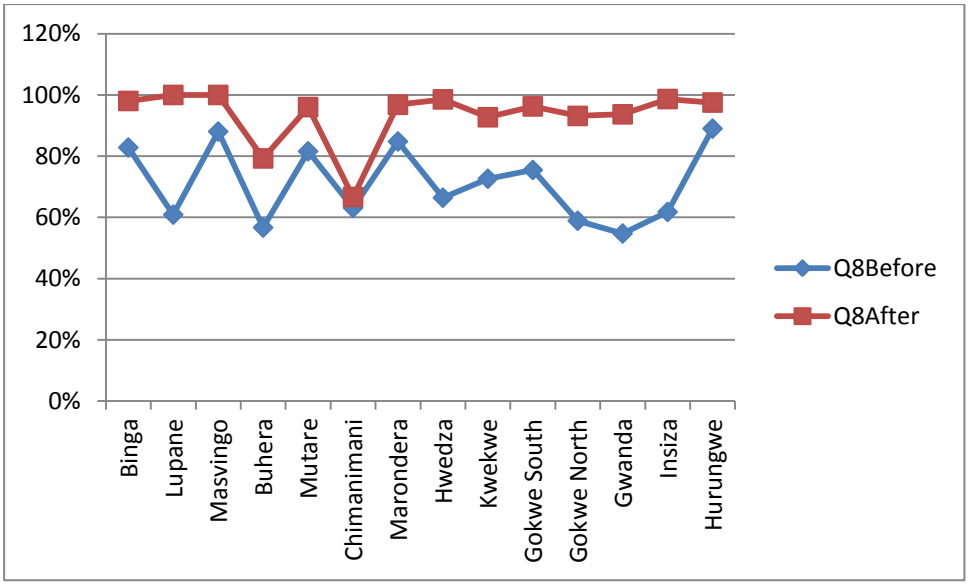

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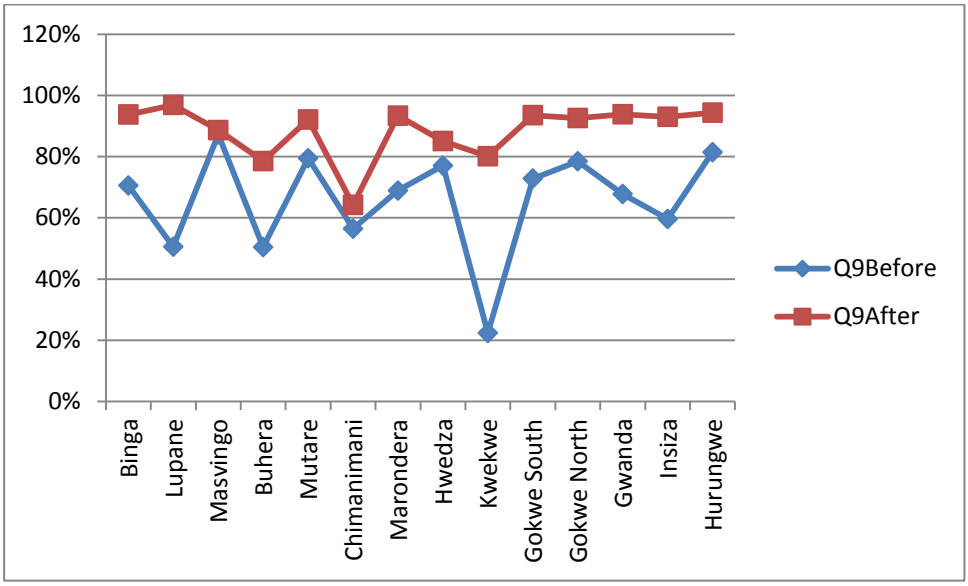

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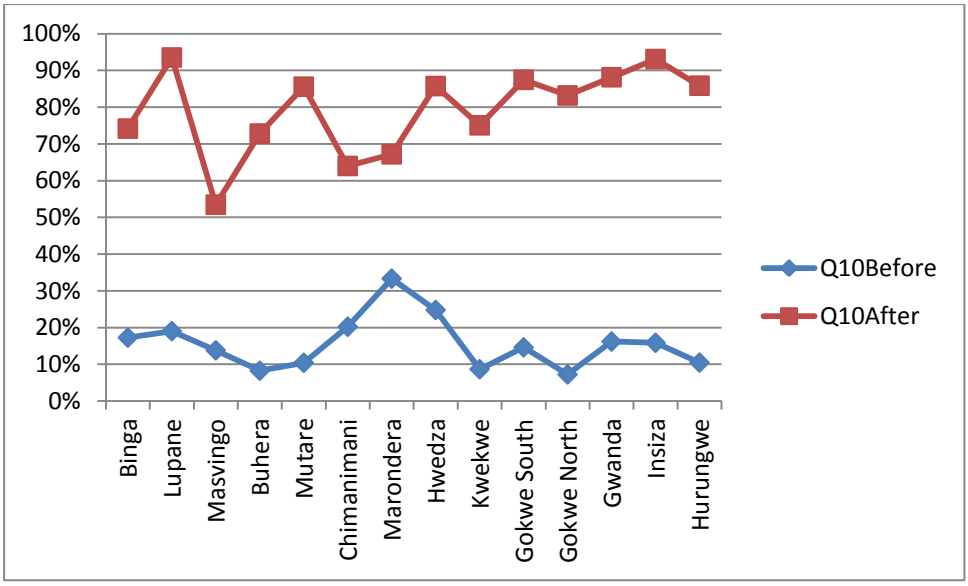

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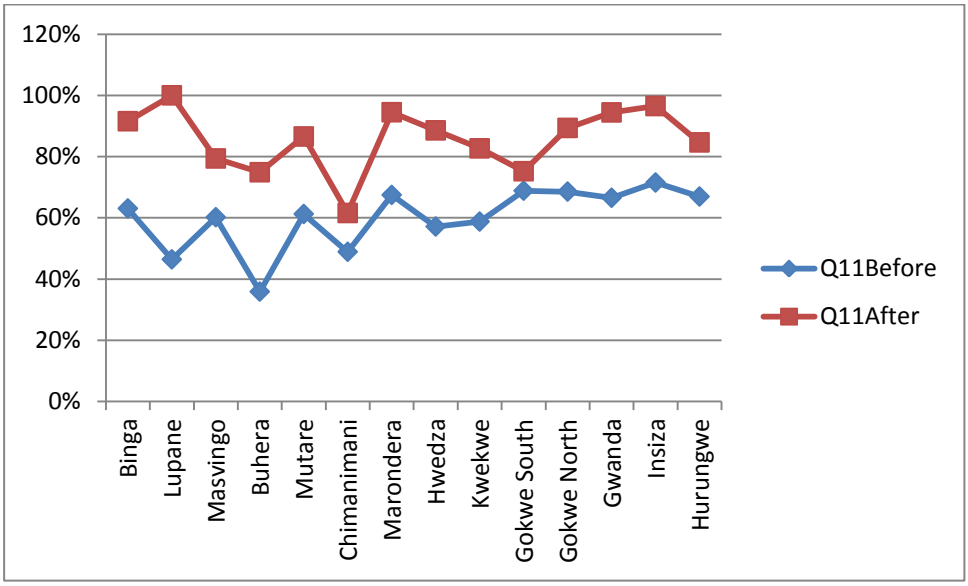

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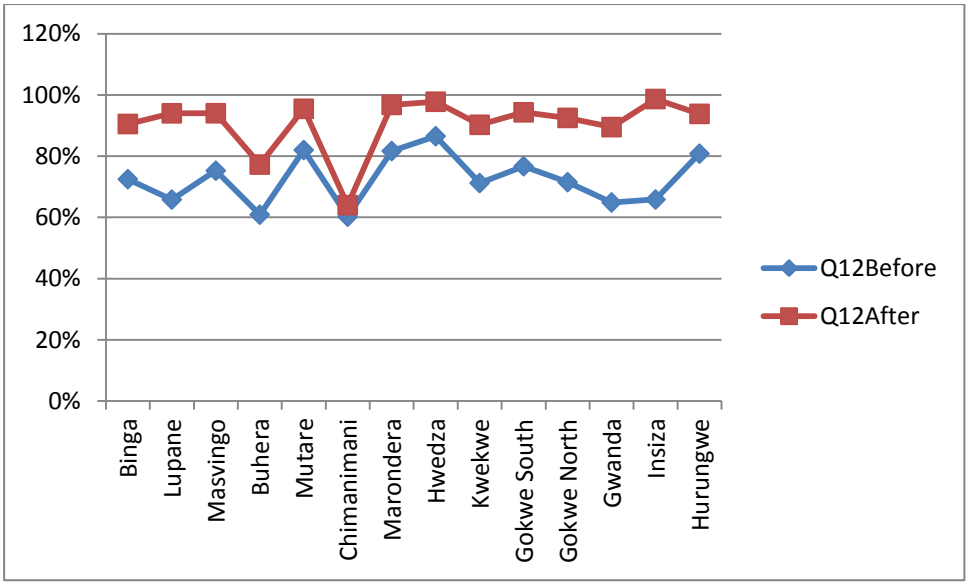
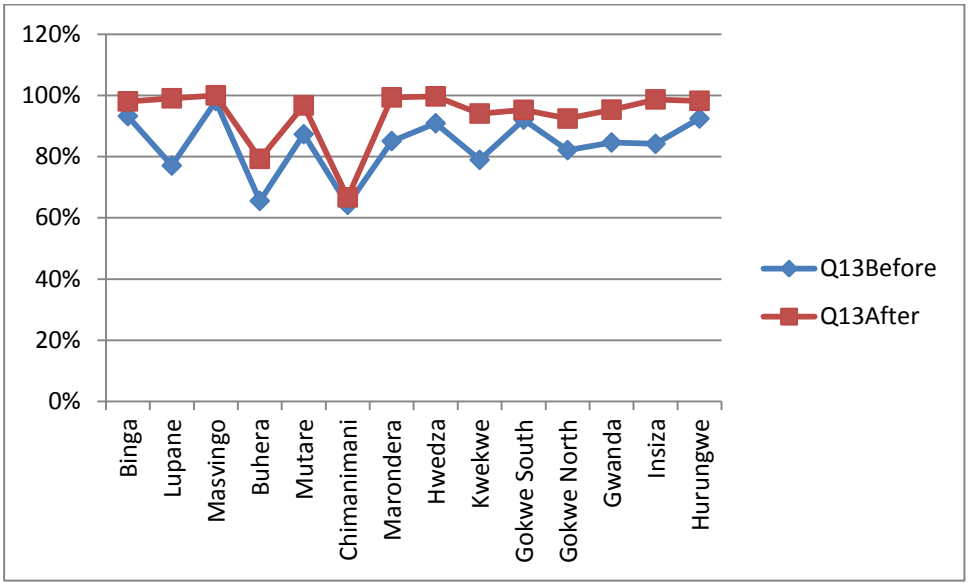
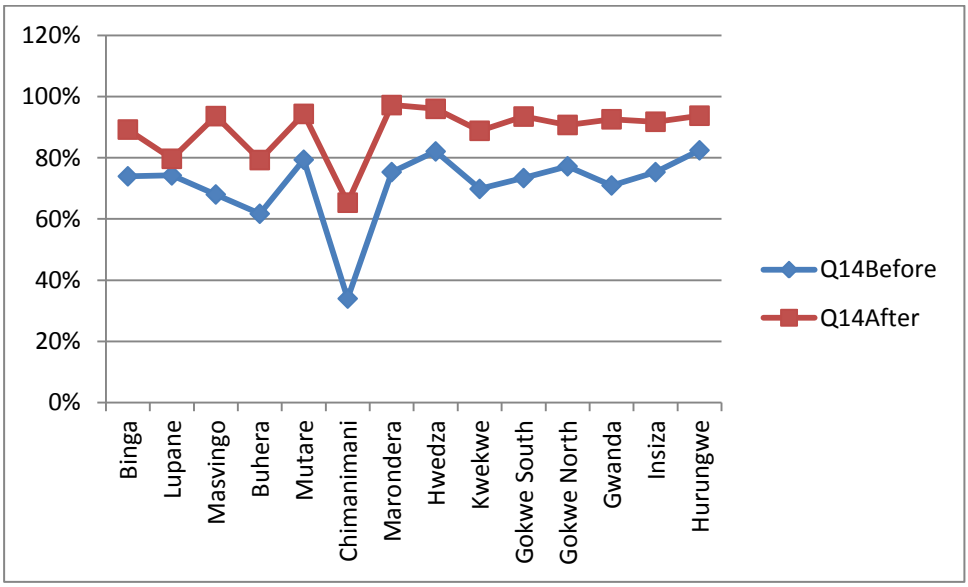


Question 13



Question 14



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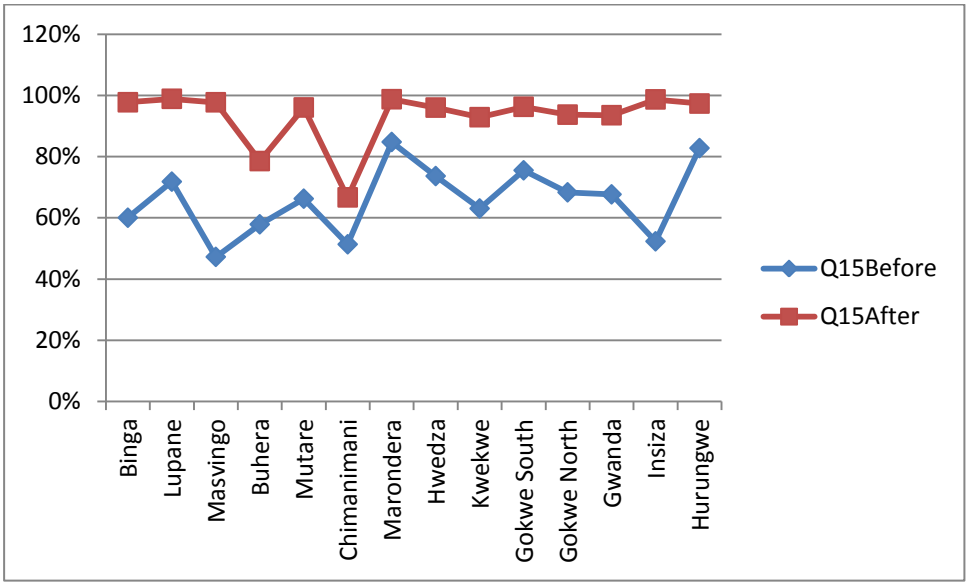
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Gwanda
Insiza
Hurungwe
Q15Before
Q15After

Annexure 6: Instructions to Authors, Journal of Nutrition Education and Behavior, Great Educational Material

JOURNAL OF NUTRITION EDUCATION AND BEHAVIOR

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AUTHOR INFORMATION PACK

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DESCRIPTION

Aims & Scopes

The *Journal of Nutrition Education and Behavior (JNEB)*, the official journal of the Society for Nutrition Education and Behavior , is a refereed, scientific periodical that serves as a resource for all professionals with an interest in nutrition education and dietary/physical activity behaviors. The purpose of *JNEB* is to document and disseminate original research, emerging issues and practices relevant to nutrition education and behavior worldwide.The *Journal of Nutrition Education and Behavior* welcomes evidence-based manuscripts that provide new insights and useful findings related to nutrition education research, practice and policy. The content areas of *JNEB* reflect the diverse interests of health, nutrition, education, Cooperative Extension and other professionals working in areas related to nutrition education and behavior. As the Society's official journal, *JNEB* also includes occasional policy statements, issue perspectives, and member communications.Guidelines for Authors are available at www.jneb.org/authorinfo

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Great Educational Materials (*GEMs*) are brief descriptions of innovative and useful approaches to nutrition education and behavior. A *GEM* includes a description of the approach (teaching technique, activity, or material), objective(s), intended audience, implementation procedures, and evidence of usefulness or impact. Photographs or other visual materials may be included to enhance the description.

GEMs do not require abstracts. However, please provide 2 to 3 sentences summarizing the educational program or tool being evaluated and the results of the evaluation (50-word limit). This summary will be sent to reviewers and will not be part of the *GEM*'s publication. *GEMs* include an Introduction, which describes why the program or activity is worth reading about. The body or content of a *GEM* states the target audience and notes the adaptability of the program to different audiences. It also states the purpose/objective of the program/activity, describes how one would implement the program/activity, and explains how the program/activity has been evaluated and with what results. If applicable, it also describes plans for future refinement/use and the application or use of theory and/or models to program design and/or evaluation.

Letters to the Editor

Letters to the Editor are timely and succinct expressions of responsible criticism or reaction to material published in recent issues. A *Letter to the Editor* may also call attention to topics of general interest to readers. Submission of a *Letter to the Editor* constitutes permission for *JNEB* to publish it with or without editing and abridgment. Authors of *Letters to the Editor* must acknowledge financial and other conflicts of interest within the letter. Authors of the articles referred to in *Letters to the Editor* will be given an opportunity to respond in a letter for simultaneous publication. *Letters to the Editor* are published online and listed in the print issue's table of contents and may also be shared in the e*Communicator*, the e-mail newsletter of the Society for Nutrition Education and Behavior.

JNEB Style and Form

General style and form and writing style

JNEB adheres to the style recommendations outlined in the *American Medical Association Manual of Style*, 10th edition (http://www.amamanualofstyle.com/). Manuscripts should be written in good scientific English (American or British usage is accepted, but not a mixture of these). Authors who feel their manuscript may not conform to correct scientific English may wish to use the English Language Editing service available from Elsevier (http://webshop.elsevier.com/languageediting/) or use another science editing service.

Please note the following additional style requirements and format manuscripts accordingly before submission:

- Abbreviations, acronyms, and initialisms should be spelled out on first use, with the shortened versions immediately following in parentheses. Example: Supplemental Nutrition Assistance Program (SNAP). Manuscripts should be limited to a total of five acronyms, abbreviations, and initialisms to limit reader confusion. Beyond this, all terms must be spelled out. A list of approved terms that may be used in their abbreviated forms on first use is available here.
- Behavior theories or models mentioned frequently in a manuscript should be abbreviated whenever possible. Example: Social Cognitive Theory (SCT).
- "N" and "n" should be used as follows: "N" indicates a whole population or an epidemiological study; "n" indicates a sample or subpopulation.
- Sentences in unstructured abstracts or in the body of a manuscript may not begin with a numeral. Example: "Four hundred thirty-five parents were surveyed [...]" not "435 parents were surveyed [...]" Sentences in structured abstracts may begin with a numeral (as structured abstracts often contain sentence fragments).

• Decimals should be used only to 1 degree more than the unit of measurement. For whole numbers, decimals need to be rounded to tenths; if precision of measurement is in the tenths, you may use hundredths (eg, with weight measured to the tenth of a pound, means may be expressed as hundredths). Please be sure of your precision: while most software will express results greater than the precision, it is not appropriate to use these figures in tables (eg, 34.1 mg niacin).
The exception to this is percentages concerning people. For fewer than 100 people, please round to the nearest whole percentage, eg, 95% of participants (n = 80), rather than 95.3% of participants (n = 80).
• When reporting *P*, values less than .001 should be reported as such: $P < .001$. Actual values for *P* should be expressed to 2 digits for $P \leq .01$, whether or not *P* is significant. If *P* is < .01, there should be 3 significant figures reported (eg, $P = .008$). Use *P* values rather than alpha values. For general statistical guidelines, please read Guidelines for Statistical Methods for JNEB.

The past tense of verbs is used to discuss methods and results, with the exception of *Research Methods*, where the present tense should be used. Present tense is used to refer to existing literature or general truths and to state conclusions. Active voice is preferred. Jargon and sexist language should be avoided. For preferred usage of terms related to race and ethnicity, see the *American Medical Association Manual of Style*, 10th edition. Authors have access to reviewer guidelines for both quantitative and qualitative research.

Key words
All structured and unstructured abstracts are accompanied by a list of 3 to 5 key words for indexing. Key words are selected from the listing of Medical Subject Headings (MeSH) outlined by MEDLINE (http://www.nlm.nih.gov/mesh/MBrowser.html) that are used for indexing in PubMed. To maximize the likelihood that your paper will be identified appropriately by other researchers, educators, and administrators, it is important to choose MeSH key words whenever possible. Choosing non-MeSH terms will make it more difficult for your article to be appropriately cited.

Tables
For submission, each table should be saved and uploaded as a separate file. Number tables consecutively in accordance with their appearance in the text. If there is only one table, then no number is assigned (eg, "Table"). Format tables as follows:

Title: Provide a table number and a descriptive title. Words in the title are capitalized. The title should describe the type of data included and give the sample size (n) unless it varies by measure/variable (in which case, n should be included within the table content).
Example of unacceptable table title: "Descriptive Demographics"
Example of acceptable table title: "Anthropometric and Socioeconomic Data for Adults Enrolled in Healthy Eating Programs (n = 40)"
Content: Not all data included in tables needs to be reported within the text of the manuscript. The most important results should be included in the narrative (text), but repeating results that will not be discussed further is discouraged. Bullets should not be used within a table. For qualitative tables, indentation of text may also be used within a section.
Footnotes: The order of items within the footnote is as follows: abbreviations, then statistical significance, then statistical test used. Any abbreviation used in the table should be spelled out in the footnote. If not included in the table content, statistical significance should be identified with an asterisk (eg, $*P < .05$; $P < .01$; $P < .001$; or *Significance based on 95% CI). Statistical test used (eg, chi-square, logistic regression) and statistical adjustments made to models should also be identified. The table title, data/content, and footnotes should be complete enough to understand without referring to related text.
Statistics: Report means and standard deviations if the data have a normal distribution; report the interquartile range (IQR) and the median if the data are not normally distributed. Standard error of the mean (SEM) should only be used if multiple samples are gathered (eg, groups of schools). Confidence intervals (CIs) should be included if relative risk or odds ratios are given in the table. The statistical significance (*P*) may be included as the number (eg, $P < .05$) or indicated by an asterisk and footnote (see Footnotes section, above). Superscripted lowercase letters may be used if differences among several groups are to be shown. Differences between 2 or more groups should include a column for *P* or an asterisk to indicate significance, where appropriate.
Refer to the "General style and form and writing style" section above for guidance on the number of decimals places or significant digits to show in tables.

Figures and artwork
For submission, each figure should be saved and uploaded as a separate file. Number figures consecutively in accordance with their appearance in the text. If there is only one figure, then no number is assigned (eg, "Figure"). Format figures as follows:

Caption: Figure captions should be presented at the end of the manuscript just after the references (captions should not be attached to the figures themselves). Captions constitute a distinct section of the manuscript and should start on a new page. Ensure that each illustration has a caption. A caption should consist of a brief title and a description of the illustration. Figure captions should be written in sentence format.
Example of unacceptable caption: "Body Mass Index (BMI) versus calories."
Example of acceptable caption: "Body Mass Index (BMI) versus calories consumed after 3-month intervention with 10- to 12-year-olds."
Figure captions should also explain any abbreviations or statistical tests (eg, chi-square, logistic regression). Keep text in figures to a minimum; instead, use figure captions to explain all symbols and abbreviations used.
Content: Lettering and data symbols must be clear and consistent on each figure. Use uniform lettering and size your original artwork consistently. Only use the following fonts in illustrations: Arial, Courier, Helvetica, Times New Roman, and Symbol. Titles, explanations, and definitions of abbreviations must be noted in the legends, not on the figures themselves.

A detailed guide on electronic artwork is available at http://www.elsevier.com/artworkinstructions. If figures do not meet these guidelines and do not appear to be clearly reproducible, they will be returned to authors with a request for new figures at any stage of publication.

Consort diagrams should be used to explain recruitment/enrollment/retention of subjects for any intervention (see Williams-Piehota et al, JNEB 41(6), 2009). Other appropriate figures include maps (see Stone, JNEB 43(4S2), 2011), scatter grams for continuous data, bar graphs for categorical data (eg, body mass index by gender), and diagrams for spatial and conceptual relationships, such as the Social Ecological Model.

For *GEMs*, it is preferred that authors use 1 to 2 figures that enhance the *GEM* description (photos should meet this requirement and not simply show authors or participants). Figures must also be referred to within the text. For recognizable photo(s), you must have release form(s) from the subject(s).

In order to maintain a clear separation between the author and any other agency, the editors require that all figures, tables, and photographs be submitted directly by the contributing author and no other source.

References
Each new reference introduced in the text is numbered sequentially. The reference number appears superscripted immediately following related text. The reference list is double-spaced and numbered to correspond with citations in text. Reference style follows the system described in the *American Medical Association Manual of Style*, 10th edition, except that issue numbers are not included in journal references. MEDLINE abbreviations are used for periodical titles. If a standard abbreviation is not available on MEDLINE, cite the full title. Examples of different reference types follow:

Journal Article
Olson CM. Tracking of food choices across the transition to motherhood. *J Nutr Educ Behav*. 2005;37:129-136.

Book
Glanz K, Rimer BK, Lewis FM, eds. *Health Behavior and Health Education: Theory, Research, and Practice*. 3rd ed. San Francisco, CA: Jossey-Bass Publishers; 2002.

Book Chapter
Baranowski T, Perry CL, Parcel GS. How individuals, environments, and health behavior interact. In: Glanz K, Rimer BK, Lewis FM, eds. *Health Behavior and Health Education: Theory, Research, and Practice*. 3rd ed. San Francisco, CA: Jossey-Bass Publishers; 2002:165-184.

JNEB uses a double-blind review system. Therefore, authors should blind all authors' names and corresponding institutions from the manuscript, including references to their institutions' Institutional Review Boards, if applicable. If an author's name appears within a reference, all authors' names should be blinded from that reference (all other information within the reference should remain as is). Authors may blind additional areas, such as program titles or cities/countries of reference, but are not required to do so. *JNEB* recommends blinding by omission, using "x" or "blinded" rather than a black highlight over words. *JNEB* accepts most word processing formats, although Microsoft Word is preferred. Always keep a backup copy of the electronic file for reference and safety. Save your files using the default extension of the program used.

Before submitting, please ensure that one author has been designated the corresponding author (include his or her e-mail address, full postal address, and phone and fax numbers). Additionally, check that all necessary files have been uploaded and that they contain key words, figure captions, and tables. Ensure that references are formatted correctly for *JNEB* and that permission has been obtained for use of copyrighted material from other sources (print or online).

Items (and the preferred order of files) when submitting a manuscript for review include:
- cover letter (save as a separate file)
- suggested reviewers (include in cover letter)
- reviewers who should not be assigned to the manuscript due to potential conflicts of interest (include in cover letter)
- title page (save as a separate file)
- abstract (save as a separate file)
- manuscript (main text, references, and figure legends; save as a separate file)
- tables (save as individual files)
- figures (save as individual files)
- ancillary materials (eg, tests, surveys, interview scripts, observation forms; must be blinded for review)
- supplementary material (eg, any of the above, as well as supporting applications, movies, animation sequences, high-resolution images, background datasets)

Revised manuscripts also should be accompanied by a unique file type titled "Detailed Response to Reviewers" (separate from the cover letter). This file should include a tabular format of all editor and reviewer comments; each comment should be followed by your response, along with the line number where it appears in the revised manuscript.

Files should be labeled with appropriate and descriptive file names (eg, Manuscript.doc, Fig1.eps, Table3.doc). Upload text, tables, and graphics (figures) as separate files. You can compress multiple figure files into a ZIP file and upload it in one step; the system will then unpack the files and prompt you to name each figure. Do not import figures or tables into the text document, and do not upload your text as a PDF. Complete instructions for electronic artwork are available at http://ees.elsevier.com/jneb.

Authors who are unable to provide an electronic version or have other circumstances that prevent online transmission of manuscripts must contact the editorial office prior to submission to discuss alternate options. The publisher and editors regret that they are not able to consider submissions that do not follow these procedures.

Submission items

Cover letter: The cover letter (save as a separate file for submission) indicates the type of manuscript being submitted (see the categories described above); describes why the manuscript would be of interest to *JNEB* readers; specifies that the manuscript, or parts of it, have not been and will not be submitted elsewhere for publication; notes overlapping or related manuscripts under review, in press, or published; identifies the corresponding author; states that all authors have reviewed and approved the complete manuscript (including tables, figures, and ancillary material, where applicable); indicates the manuscript's complete page count (including text, acknowledgments, references, tables, figures, and other illustrations).

Title page: The title page includes the title of the manuscript (good titles are short, use the active voice, and capture key findings; avoid trite titles and question marks); the section of the journal for which the manuscript is intended; the names of all authors, their academic degree (eg, PhD, listing only the highest degree), professional credentials (eg, RD), and affiliations; the name, full postal address, telephone number, fax number, and e-mail address of the corresponding author; the name and address of the institution at which the work was conducted if it differs from the present affiliation of the first author; and then the Acknowledgments section (for *Research Articles*, *Research Briefs*, *Research Methods*, *Reports*, *Systematic Reviews*, and *Viewpoints* only).

Title "Acknowledgments" on the title page: Acknowledgments identify sources of financial support for the work reported in the manuscript, sources of substantial technical assistance, and sources from which some or all of the data were taken (eg, a thesis, dissertation, presentation, or report). Acknowledgments should not be numbered or referred to in the text.

Title "Notes" on the title page (*GEMs* only): The "Notes" on the title page must include approval from a human subjects committee if the *GEM* report evaluation results involve subjects. If no institutional review board (IRB) approval was necessary for this research, please add a statement explaining why. In this statement, include which institution reviewed the study and decided that it was exempt from IRB review (institution should be blinded for review). If it was not reviewed by your university or institution, please provide the documentation that pertains to this type of study, deeming it unnecessary to be reviewed. An example of this may be:
"Review by the institutional review board was not required for this study because human subjects were not involved, as per US Department of Health and Human Services guidelines (http://www.hhs.gov/ohrp/policy/checklists/decisioncharts.html#c1)."

Notes may also include information on how to obtain materials, acknowledgment of technical assistance, sources of financial support, and collaborators.

Note: Because *JNEB* employs a double-blinded review process, please include author information and acknowledgments only on the title page of your manuscript. Save the title page as a separate file. You will be asked to upload the title page file when you submit your manuscript online.

Abstract page: The abstract page should contain the abstract, abstract word count, and key words (saved as a separate file). All manuscripts must include an abstract word count, which should be written in parentheses immediately following the abstract's last line.

Manuscript review

When a manuscript is uploaded to the online peer-review system, an e-mail confirming receipt is sent to authors. The handling editor may return a manuscript to the author without review if it does not conform to the guidelines presented here, is outside the scope of the journal, or overlaps substantially with related manuscripts in review, in press, or published.

Manuscripts meeting basic requirements are distributed to a panel of 2 to 3 reviewers. Replacement reviewers are assigned as needed.

The review process takes approximately 5 weeks, depending on the availability of reviewers. Authors receive blinded reviewer comments, along with a letter from the handling editor. The reviewers may submit confidential comments to the editor, which are not available for review by the author. The editor may accept or reject a manuscript or request that it be revised before a final decision is made.

Annexure 7: Instructions to authors Rural and Remote Health Journal Original Research submission (http://www.rrh.org.au/background/InformationForAuthors.asp)

Style

Manuscripts should follow the style of the Vancouver Agreement as detailed in the 'Uniform Requirements for Manuscripts Submitted to Biomedical Journals' http://www.icmje.org/.

Please be aware that RRH style varies slightly from the style described on the ICMJE site, for example RRH articles present journal names in full in the reference list (not abbreviated). Therefore, please read the following style notes.

Authorial voice for research manuscripts In keeping with scientific method, a passive (reporting) voice is mandatory for original research manuscripts submitted to this journal. This traditional, objective approach focuses attention on the data and what they show. Any research manuscript using first person (eg “I designed the study to...” or “We designed the study to...”) rather than the passive voice (eg “The study was designed to...”) will be returned to the authors for conversion before consideration for review. Decisions about permitting the use of first person (singular or plural) in project reports will be made by the respective Regional Editor prior to review.

Writing on-line text for publication:

Readers respond to digital material (accessed using a computer screen) in a different way from the same material in a printed version. Reading on-line text is generally slower and may result in reduced reader comprehension. This is due to a variety of factors, including the back lighting of the screen, pixelated characters, and user preference for information presented in portrait orientation and double-page format. Because RRH publishes in electronic format only, authors may find the guidelines in the following section useful.

Text structure & article length:

In order to facilitate and maximise readers' comprehension of your work, consider making some modification to your text structure:

- Short pieces of writing are appealing in this form of publication and are more likely to be accessed and read than are longer articles. The word count (all words between the first word of the introduction and the final word of the conclusion, with the exception of tables and figures

and their legends, acknowledgements, reference list, appendix) of ANY manuscript should be less than 5000 words, specifically:

- Editorial: less than 2000 words
- Commentary: less than 2000 words
- Original research: less than 5000 words
- Review article: less than 5000 words (see notes below)
- Clinical case report: less than 3000 words
- Clinical review: less than 3000 words
- Short communication: less than 1500 words
- Policy report: less than 2500 words
- Project report: less than 2500 words
- Conference report: less than 2500 words
- Personal view: less than 3000 words
- Rural health history: less than 2000 words
- Biography, Tribute or Obituary: less than 1500 words
- Book review: less than 500 words
- Letter (research letter, standard letter to the editor or a post via the on-line forum): less than 500 words

• A ‘research letter’ is different from a standard letter to the editor, short report or research note. It is a brief referenced outline of the issue discussed, followed by detail about the present study, bringing one or two novel or important conclusions to the attention of readers - all presented in the format of a letter to the editor, without an abstract. A detailed discussion is not required. There should be a maximum of 5 references. The total word count for the letter text should be approximately 500 words, with the addition of one small table, if necessary.

• It is an unfortunate reality that many readers will only read the article abstract. Therefore, make sure the abstract is concise and well written, acurately represents the main text, and that

the length of a structured abstract is no more than 500 words (shorter for unstructured abstract). Detail of abstract structure is given under 'Sections of the manuscript'.

- Within the article text, write shorter sentences than usual where possible. Consider whether compound sentences could be divided.

- Consider using bullet points or a numbered list instead of complex 'list' sentences.

- Likewise, where possible break the text into short paragraphs of five to seven sentences.

- Provide frequent section headings that cue the reader to the content of the paragraphs that follow.

Guidance for preparing systematic reviews

A systematic literature review will be less than 5000 words in length. In exceptional circumstances, supplemental material can be included as addendum for peer review, but this material will not be published by the journal, and readers will need to be advised to request this from the authors.

After peer review: At the end of revision it is likely that authors will need to re-order the reference list to reinstate the strict numeric order of reference citations in the text. Authors are reminded that reference citations in tables are numbered sequentially with surrounding text citations, according to the placement of table legends in the text (generally after the paragraph that contains the first citation to the particular table). This is the authors' responsibility. If in doubt, please contact the production editor for advice.

It is recommended that RRH review authors include the following information in the relevant sections of the article. This will increase the likelihood of acceptance for peer review.

Introduction: The introduction should provide a short background to the research area, clear rationale for the review, and the specific questions the authors are attempting to answer through the review. Any previous reviews in this area should be discussed and critiqued as appropriate, and a clear statement made indicating how this review will address identified omissions and/or weaknesses in the published literature.

Method: The search strategy section should detail the databases and journals accessed with the date of search, and any attempts to access the 'grey literature' should be noted. The actual search terms and strategy used should be provided for at least one electronic database, detailing the exact process of search and combination of search outputs. This should include information about MESH terms used, or note if only a key-word search was undertaken.

The authors should provide a clear statement of inclusion and exclusion criteria for manuscripts considered in the review, and the process by which they were applied to papers identified by the described search.

The process of data extraction should be described and, if undertaken, how effect sizes were calculated and extracted from the data. Any process for collecting data directly from other authors should also be provided.

Results: A summary of the output of the searches should be provided (number of papers identified) and then the results of the screening processes detailed, ideally providing the number of papers excluded at each stage and a summary of the reasons for exclusion. A flow chart can usually summarize this information very efficiently.

The authors should then provide a description of the papers focused on, with key study characteristics (design, location, measures) included in their analysis and supported by appropriate tables.

Next, the authors should complete a qualitative or quantitative synthesis of the research papers, with particular reference to the research question articulated in the discussion.

Discussion: This should follow the argument structure common to all research papers.

Spelling & capitalisation:

Authors may use Australian, UK or US spelling, but please avoid using a mixture of spelling styles within the manuscript. Authors should follow the latest edition of the Macquarie dictionary for Australian spelling, the Oxford dictionary for UK spelling or Webster's dictionary for US spelling.

This journal uses minimal capitalisation, therefore authors are asked to capitalise only proper nouns (eg names and personal, programme and institutional titles).

Abbreviations & local terminology:

Abbreviations and local terminology: All abbreviations and acronyms should be spelled out at first use, with the exception of any acronym in the following list, all of which may be used without definition.

- AIDS Acquired Immune Deficiency Syndrome
- AFB Acid-fast Bacteria

- BMI Body mass index
- BP Blood Pressure
- BSL Blood Sugar Level
- CB Citizens Band (radio)
- CEO Chief Executive Officer
- CPR Cardiopulmonary Resuscitation
- CT Computed Tomography
- EURIPA European Remote and Isolated Practitioner Association
- GP General Practitioner
- HCG Human Chorionic Gonadotrophin
- HF High Frequency
- HIV Human Immuno-deficiency Virus
- HRT Hormone Replacement Therapy
- ICU Intensive Care Unit
- IMF International Monetary Fund
- IHW Indigenous Health Worker
- IT Information Technology
- MRI Magnetic Resonance Imaging
- OECD Organization for Economic Co-operation and Development
- SIDS Sudden Infant Death Syndrome
- STI Sexually Transmitted Infection
- TB Tuberculosis
- UCLA University of California, Los Angeles

- UNICEF United Nations International Children's Emergency Fund
- USA United States of America
- WHO World Health Organisation
- Wonca World Organization of Family Doctors
- WTO World Trade Organisation

Abbreviations are unnecessary in the abstract unless the term is repeated in the abstract.

Because RRH is an international journal, please give a brief explanation of any locally used terminology in the text (eg Medicade or Medicare) for the benefit of readers in other world regions.

Likewise, any references to currency should be specified at first use (eg UD$, AU$ or 'Namibian dollars (NAD)')

Units:

In accordance with international scholarly convention, all units must be provided as Système Internationale (SI) units http://physics.nist.gov/cuu/Units/index.html. Imperial units can be given in brackets following the SI units, if desired.

Special characters:

Because non-keyboard characters may not reproduce reliably across platforms and after electronic transfer, the use of special characters/symbols in the text should be accompanied by a spell-out of that character in brackets, for example, □ (chi), □ (alpha). The bracketed text will be removed during the editing process.

Quoted material:

Direct quotes from other published works, others' ideas (published or not) or study participants must be clearly identifiable as such. Please use either italic font or quotation marks (inverted commas) but never both.

While quotes of less than 30 words may be retained in quotation marks within a paragraph text, quotes of more than 30 words are generally indented in a separate paragraph in italic font and presented without quotation marks. These 'rules of thumb' are provided to guide authors;

however, editorial judgement may result in slight variation in the published form, in order to maximize reader comprehension with reference to online layout.

Statistics:

Please describe statistical methods with sufficient detail to enable a knowledgeable reader with access to the original data to verify your reported results. Provide actual numbers as well as percentages in both text and tables and, wherever possible, include 'total' rows and columns in tables.

For surveys, ensure that the response rate is described and, if necessary, discuss any biases due to a low response. A justification should be provided for sample size based on the required accuracy of results. In addition, 95% confidence intervals should be given for the main results.

For intervention studies/trials, ensure that the response rate is described and any biases discussed. A justification should be provided for sample size, based on the required power.

All statistical tests should be described. If parametric analyses (eg t-test, analysis of variance or multiple regression) have been undertaken, make sure that the dependent variable was first checked for normality.

Specify in the text the statistical software used, giving company detail (name and URL). Do NOT include software detail in the reference list.

It is acknowledged that authors working in rural/remote areas may have reduced access to statistical advice. In that case, statistical queries may be emailed to the journal for advice before the manuscript is ready for submission.

Sections of the manuscript

Title page:

The first page or beginning of the manuscript file should identify the type of article you are submitting, the title of your manuscript, the full names, position titles, institutional addresses (current at the time the work was undertaken) and current email and institutional addresses for all authors. The highest academic qualification of each author should be given.

If more than one author is registered with the journal, the correspondence nominated author should be indicated by adding an asterisk after his or her name - and a current address provided if it is different from the study address. If any author has a preferred form of name for

publication, please advise. Sources of support in the form of grants, equipment and/or drugs should also be specified here, as should declarations of conflict of interest.

Headings:

The main headings authors select define the structure of their manuscript. Where possible, please 'structure' the abstract and the main text using the research headings: Introduction, Methods, Results, Discussion and Conclusions (note: the 'Discussion' heading is not used in the abstract).

If this is not possible, review manuscripts, reports, personal views and clinical material may be structured with the following heading set: Context, Issue, Lessons learned. In this case, authors should provide a thorough summary and discursive material, as well as the main points and recommendations from the manuscript.

Whichever set of main headings is selected, the same main headings will be used in abstract and main manuscript text. A mixture of main heading types is never appropriate.

In this journal, the formatting of heading grades is as follows:

- main headings: bold font
- level 2: bold and italic fonts
- level 3: bold font set into the paragraph and followed by a colon
- level 4: bold and italic fonts set into the paragraph with no following punctuation.

Abstract:

Rural and Remote Health requires that the abstract be a substantial piece of writing in its own right and of 500 words' length. The abstract should state the purpose/s of the study or investigation, basic procedures followed (selection of study subjects; observational and analytical methods), main findings (including specific data and their statistical significance, if applicable), and the main conclusions. New and important aspects of the study and rural relevance should be emphasised.

Keywords:

Up to 10 key words in alphabetical order should be included when submitting the manuscript. Terms from Medical Subject Headings (MeSH) http://www.nlm.nih.gov/mesh/introduction2004.html should be considered. The key words

selected from the journal key words screen during the submission process will be used after publication as search terms, and also to select registered user recipients for the article alert. The key words will also assist in cross-indexing the article at abstracting services.

Main text:

For guidance as to the structure of the sections 'Introduction', 'Methods', 'Results' and 'Conclusions', authors are referred to http://www.icmje.org. For reports, personal views and clinical material the following headings should be used in the main text, as in the abstract: Context, Issue, Lessons learned.

Book reviews should be accompanied by: the full title of the book reviewed; the full name/s of the author/s and/or editor/s of the volume; the date of publication; the name and city of the publisher; the ISSN and RRP in AU$, and whether the book is case bound or soft covered. Please include the reviewer's name and institutional address in the file.

Acknowledgements:

The Acknowledgement section is the place to list all contributors who do not meet the criteria for authorship (eg someone who provided purely technical help or writing assistance) but please obtain permission to do so. Specify the role of these people (eg critically reviewed the study proposal, or cared for study patients). Financial and material support should also be acknowledged here, including detail of any organisation that has made a contribution to your research.

References:

When listing references, follow the Vancouver style at http://www.icmje.org. However, please list the journal titles in the reference list IN FULL (ie do NOT abbreviate them). References should be cited consecutively in the text using numbers in square brackets. The numbered reference list follows the order in which references first appear in the text.

Please ensure that all reference indicators in the text are enclosed in square brackets (with no leading space before the opening bracket) and placed within punctuation (eg "Brown discussed rural access[23]; however, White did not[24]."). Because staff do not convert reference citations to superscript until after review and approval for publication, please do NOT format reference citations in superscript font.

Please convert endnoted reference lists to plain text. (see "Why can’t I use Endnote references?" in the Frequently Asked Questions companion document).

As well as providing journal titles in full, publication year and volume number, please provide journal issue numbers where possible. Page ranges should be given in full (eg 673-678, NOT 673-8).

Note: list all authors and/or editors up to 6; if there are more than 6, list the first 6 and add 'et al'.

Personal communications (which may only be included with permission), unpublished data and personal observations should not be included in the reference list, however they may be placed in the text (eg P Smith, pers. comm., 2001). Likewise, any statistical software used to process your data should be cited in the text, providing the name and version of the package, with the company name and a valid URL in brackets.

Footnotes must be manually repositioned within the body of the text before publication. Please integrate any textual footnotes into the main text or consider deleting them.

Some examples of the journal's style of references follow; for a more comprehensive list, please view the examples at http://www.icmje.org.

Journal article

Veitch C, Hollins J, Worley P, Mitchell G. General practice research. Problems and solutions in participant recruitment and retention. Australian Family Physician 2001; 4(3): 399-406.

Book

Hudson R, Richmond J. Unique and ordinary, 2nd edn. Melbourne, VIC: Ausmed, 2000.

Book chapter with different authors and editors

Rosenthal M, Bond MR. Behavioural and psychiatric sequelae. In: M Rosenthal, ER Griffith, JS Kreutzer, B Pentland (Eds); Rehabilitation of the adult and child with traumatic brain injury. New York, NY: FA Davis, 1990; 179-192. [NB: the editors' initials are given BEFORE the family name]

Book: author as editor

Norman IJ, Redfern SJ (Eds). Mental health care for elderly people. New York: Churchill Livingstone, 1996.

Report: personal author

Garnaut J, Lim-Applegate H. People in farming, Australian Bureau of Agricultural and Resource Economics. ABARE research report 98/6. Canberra, ACT: AGPS, 1998.

Report: corporate author

Commonwealth Department of Human Services and Health. Rural doctors: reforming undergraduate medical education for rural practice. Final report of the Rural Undergraduate Steering Committee. Canberra, ACT: AGPS, 1994.

Conference paper

Coombe PE, Phillips M-J, Masters R. Review of current provision of rural and remote psychiatric services. In: Proceedings, National Workshop on Remote Services; 17-19 October 2001; Alice Springs, NT. Melbourne, VIC: Blackwell Publishing Asia, 2002.

Thesis (unpublished)

Kissane RJ. Post-hospital home health care in rural centres: access and equity for some (PhD thesis). Geelong, VIC: Deakin University, 2002.

Journal article accepted but not yet published

Slaven J, Kisely S. Staff perceptions of care for deliberate self-harm patients in rural Western Australia: a qualitative study. Australian Journal of Rural Health 2002; 10: (in press).

Journal article in electronic format

Laurence COM, Wilkinson D. Towards more rural nursing and allied health services: current and potential rural activity in the Division of Health Sciences of the University of South Australia. Rural and Remote Health 2(1): 105. (Online) 2002. Available: http://www.rrh.org.au (Accessed 8 October 2002).

Tables & Figures:

Figure legends should be added to the main text, immediately after the references. Table and figure legends should describe the table or figure without need for reference to the text.

Do NOT repeat a table or figure legend in the actual table or figure.

Tables and figures should be cited in the text at least once and numbered according to their sequence of citation.

References cited in a figure, table or legend should be numbered according to the first citation of that figure or table in the text. That is, reference numbering will be continuous with the text surrounding figures and tables.

Please remember to spell out any abbreviations or acronyms that occur in a figure or table (in the legend for a figure, or as a footnote to a table). This is required even if the abbreviations or acronyms have been spelled out previously in the text.

Please do not use colour, shading or decorative formatting in tables. However, do place grid lines around all cells. Use bold font only in the header row/s.

Make table column headings descriptive but brief, with units of measurement in brackets. If you are providing both number and percent for an item, please indicate both in one column as n (%).

Footnote symbols †, ¶, §, ‡, should be used (in that order) with *, **, *** reserved for p-values.

Text used in figures/tables should be Arial font and 9 pt in size. Headings should be bold; avoid repeating titles in the figure or table. Text should have single spacing. If in doubt, check with the production editor before composing the figure. Keep in mind that figures should be meaningful, rather than decorative.

Please add figures, tables and their legends to the main text after the reference list. Production staff will place your tables and figures according to their first citation in the text, while also taking into account certain rules of composition (eg multiple tables and/or figures cited close together in the text are generally placed together).

Use the "tables" feature of your word processing programme to create tables, rather than using hard returns or tabs and tab stops to separate columns of data. Please avoid aligning values in columns using the space bar.

If you have figures or photos in jpg or gif format that are not included in your manuscript, these can be submitted in a separate submission area during the article submission process. Always retain a copy of what you submit in case of file corruption or other loss.