Health promotion: Approaches to dietary salt reduction

A thesis submitted to **RHODES UNIVERSITY** in fulfilment of the requirements for the degree of

MASTER OF PHARMACY

By

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February 2017

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Abstract

Background

Globally, non-communicable diseases are the leading causes of mortality and morbidity, with the majority of these occurring in low-middle income countries. The devastating consequences of non-communicable diseases could be curtailed through better management of four modifiable factors: physical inactivity; tobacco use; harmful use of alcohol; and unhealthy diets. The World Health Organisation has recommended dietary salt reduction as a cost-effective strategy in combatting the burden of NCDs. Consumer awareness and education is one of three primary strategies that have been identified by the World Health Organisation to achieve population-wide salt reduction. It involves the provision of salt reduction knowledge and the promotion of healthy salt related practices. These campaigns are a necessity in populations with high discretionary salt use such as South Africa. For these health promotion activities to succeed, they need to be developed with consideration of factors such as the environment, culture, and socio-economic standing of the intended target population. This two-phase health promotion study was conducted at St Mary's Development and Care Centre and the Assumption Sisters Nutrition Centre. These are two community based organisations located in Grahamstown, South Africa. A needs assessment was conducted to identify the knowledge and practices of cooks and guardians from these centres on dietary salt reduction. The aim of the second phase of the study was to conduct an educational intervention and to develop a culturally appropriate and contextually specific health information intervention through a participatory process.

Method:

This was a qualitative study that was supported by elements of quantitative research.. The first phase of the current study was a needs assessment. The first step involved an observational phase with cooks from the centres. The aim was to observe their discretionary salt use during food preparation and to document the salt content in the processed foods available at each centre. Semi-structured interviews were then conducted, with 3 cooks and 16 guardians[1] from the centres, to assess their knowledge and practices regarding salt reduction.

[1] Parents or the people responsible for the care of the children attending both centres.

Guided by findings from the needs assessment phase, an educational intervention was developed. This phase involved the participatory development of three health information leaflets and a series of educational interactive sessions were conducted. Quantitative tests to assess the readability, suitability, and actionability were conducted on the leaflets. Qualitative assessment of the leaflets involved formative evaluations conducted by health care professionals, phase 1 participants, Rhodes University peer educators, an African languages and cultural expert, and a Rhodes University student wellness manager. This step was included to assess the content validity, context specificity, acceptability, and cultural appropriateness of the materials. Educational interactive sessions were guided by constructs of the Social Cognitive Theory and were conducted on three main topics: 'Salt and my health', 'Reducing salt in my diet', and 'Reading food labels'.

Results:

The majority of the processed foods available at both centres contained low to medium levels of salt. Children at the centres were not provided with salt shakers on the tables during meal times. Cooks did not use measuring utensils when adding salt during meal preparation. Semi-structured interviews revealed that participants lacked both declarative and procedural knowledge. In terms of declarative knowledge, they were unaware of the daily salt intake recommendations and the relationship between salt and sodium. Participants were able to identify hypertension as one of the health related consequences of high salt consumption. Most participants were responsible for purchasing groceries in their households. Their self-reported food label reading behaviours and inability to read food labels highlighted their lack of procedural knowledge. Most participants reported that they added salt during meal preparation and at mealtimes, highlighting high discretionary salt use. Some participants were also aware of cultural or religious uses of salt.

The developed health information leaflets were considered to be written at a readability level appropriate for the target audience. The leaflets were also deemed to be actionable, culturally appropriate, and contextually specific and suitable materials. The educational interactive sessions were found to be interesting and informative.

Conclusions:

Findings from the needs assessment revealed the need for an educational intervention to address the identified gaps in the participants' knowledge and practices regarding dietary salt

reduction. The developed health information leaflets were found to be informative, culturally appropriate, and contextually specific, as planned. Interactive sessions provided an excellent platform to supply participants with concise and accurate information, increasing the possibility of improving their salt reduction related knowledge.

Declaration

I declare that this thesis, titled **"Health promotion: dietary approaches to dietary salt reduction"**, is my own work and that it has not been submitted for any degree or examination at any other university. All sources of information that I have used or quoted from have been indicated and acknowledged in a complete reference section.

Signature: .....

Date: .....

Acknowledgements

I would like to thank Jehovah for His guidance throughout this study.

I would also like to extend my gratitude to the following:

My principal supervisor, Prof Sunitha Srinivas, whom without her guidance, constructive criticism, patience and support, this study and thesis would have not been possible;

Dr Nicholas Townsend, my co-supervisor for his valuable inputs throughout the study;

The Rhodes University Research Office for the funding provided in 2016 through the Research Development Grant Awarded to Prof Sunitha Srinivas;

The community partner from St Mary's Development and Care Centre, the Assumption Sisters Nutrition Centre, and Oasis Grahamstown for their partnership and assistance throughout the study;

The study participants from St Mary's Development and Care Centre, the Assumption Sisters Nutrition Centre, and Oasis Grahamstown, as well as the Rhodes University Peer Educators, who made this study possible;

Mrs Beatrice Lukwe, for her assistance with translation and for facilitating the educational intervention;

Mr Sean James Bosman for language editing, Mr Niall Borland and Mrs Tanya Kent for assistance with transportation logistics;

Sister Heather Ferriera and Mr Thandi Mzizi for their valued assistance throughout the study;

Members of our research group, Theodore Duxbury, Praise Marara and Rufaro Manhanzva for their input in the development of the health information leaflets;

My friends Chipiwa, Faith, Farisai, Melissa, Nyasha, Ruvimbo, Shingi, and Travy for their constant support;

My dearest friend and research partner, Tinatsei Chigumete, who walked every step of this journey with me. Thank you for your kindness, support, and encouragement.

My brothers Kudzai, Batsirai, and Tamirira for always believing in me;

My parents Onias and Sibonginkosi Mushoriwa, for funding my studies and, most importantly, for their never ending encouragement and love.

Dedication

This thesis is dedicated to my parents Onias and Sibonginkosi Mushoriwa whose love, encouragement, and selflessness know no bounds.

Research outputs

PUBLISHED ARTICLES

Tariq, M. & Rath, S. & **Mushoriwa, F**. & Srinivas, S. **Health and Sustainable Development Challenges of the 21st Century: A Comparative Analysis of Salt Reduction Strategies.** *Population Review* 55.1 (2016). *Project MUSE.*

Mushoriwa F, Rath S, Mabika N, Bosman SJ, Srinivas SC. **Dietary Salt Reduction: A Glance at India and South Africa.** *Indian Journal of Pharmacy Practice*, 2016; 9(2):106-109.

Mushoriwa F, Townsend N, Srinivas SC. **Knowledge, attitudes and practices on dietary salt reduction of two communities in Grahamstown, South Africa.** *Nutrition and Health,* 2017. https://doi.org/10.1177/0260106016685725.

MANUSCRIPTS IN COMMUNICATION

Mushoriwa F, Rath S, Tariq M, Menze T, Srinivas SC. **Addressing non-communicable diseases: Salt reduction initiatives in G7 and BRICS countries.** Central European Journal of Public Health, 2016.

CONFERENCE PRESENTATIONS

Mushoriwa F, Srinivas S. **Salt and Our Health.** *St Mary's DCC Women's Day Breakfast, St Mary's DCC, Grahamstown, South Africa, 29 August 2015*

Mushoriwa F, Srinivas S. **A pilot study exploring the knowledge, attitudes and perceptions of Non-governmental organisation employees on food labels and the consequences of a high salt diet on health**. *The 36th Academy of Pharmaceutical Sciences of South Africa, CedarWoods of Sandton Conference Centre, Johannesburg, South Africa, 17-19 September 2015*

Mushoriwa F, Srinivas SC. **Health promotion: Approaches to Dietary Salt Reduction**. *Faculty of Pharmacy 16th Annual Research Symposium*, Rhodes University, Grahamstown, South Africa. 24 November 2015.

Mushoriwa F, Srinivas S.**Knowledge, attitudes and practices towards dietary salt reduction.** *2nd Rhodes University Community Engaged Learning Symposium*, Rhodes University, Grahamstown South Africa. 3- 5 May 2016.

Mushoriwa F, Mabika N, Srinivas SC. **Development and piloting of Health Information Leaflet on 'Salt and your Health'** *MEC Healthcare Summit and Excellence Awards*, East London International Conference Centre, East London, South Africa. 12- 13 May 2016.

AWARDS

Mushoriwa F, Chigumete TG. Joint runners-up for the **Student Researcher of the Year Award**. *Community Engagement Awards Evening*, Settlers Monument, Grahamstown, South Africa. October 2015

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List of Abbreviations

ARI	Automated Readability Index
ASNC	Assumption Sisters Nutrition Centre
AWASH	Australian Division of World Action on Salt and Health
CASH	Consensus Action on Salt Health
CBOs	Community Based Organisations
CDs	Communicable Diseases
CHERTL	Centre for Higher Education Research, Teaching and Learning
CLI	Coleman-Liau Index
AHA	American Heart Association
CVDs	Cardiovascular Diseases
FAO	Food and Agriculture Organization
FGD	Focus Group Discussion
FKGL	Flesch-Kincaid Grade Level
HIV/AIDs	Human Immunodeficiency Virus/ Acquired Immunodeficiency Syndrome
NCDs	Non-communicable Diseases
NDoH	National Department of Health
NGO	Non-Governmental Organisation
PEMAT	Patient Education Material Assessment Tool
RU	Rhodes University
SAM	Suitability Assessment of Materials
SCT	Social Cognitive Theory
SMOG	Simplified Measure of Gobbledygook
SMS	Short Message Service
SSIs	Semi-structured interviews
St Mary's DCC	St Mary's Development and Care Centre

UN	United Nations
UNDP	United Nations Development Programme
WHO	World Health Organisation

CHAPTER 1: INTRODUCTION

1.1 Background and Problem statement

In recent years there has been a marked increase in the incidence of non-communicable diseases (NCDs) globally, especially in low-middle income countries (LMIC), where 82% of NCD related deaths occur (WHO, 2015). Previously, NCDs were considered to only affect the affluent and were limited to developed countries. It is now estimated that by 2030 NCDs will be the leading causes of death in Africa, surpassing deaths caused by communicable diseases (WHO, 2010). Of the four categories of NCDs, cardiovascular diseases are the leading cause of mortality globally, with hypertension being the main risk factor (WHO, 2007). Data collected in 2008 revealed that 35.2% of South African men and 32.4% of South African women were hypertensive (WHO, 2014a).

The increased burden of NCDs has been accelerated by urbanisation and globalisation, which have influenced changes in dietary patterns and lifestyles. Socio-economic developments in these countries have led to a transition from traditional foods to increased consumption of processed foods high in fats, sugar, and salt. This has also been influenced by the increased availability and affordability of such food (Boutayeb, 2005).

Evidence highlights that through the management of the four main modifiable risk factors - physical inactivity, the harmful use of alcohol, tobacco use, and unhealthy diets - 75 % of NCD related deaths could potentially be prevented (WHO, 2015). According to WHO, excessive consumption of salt was responsible for 1.7 million annual deaths in 2010, highlighting its negative impact on health (WHO, 2014b). Excessive consumption of salt (>5g per day) is associated with increased risk of hypertension and the development of CVDs (WHO, 2012c). The WHO has identified the reduction of salt intake to less than 5g per day as the 'Best Buy' strategy to combat the global burden of NCDs (WHO & World Economic Forum, 2011). Currently, it is estimated that the global intake is around 10g/day per capita, which is double the WHO recommendation and indicative of the need for interventions around the world (University of Cambridge, 2013).

Salt reduction recommendations made by WHO are centred on three main strategies: food reformulation, policies and environmental changes, and consumer education and awareness. There is a need for WHO member states to implement these strategies in order to achieve population-wide salt reduction. The choice of strategy is determined by the main sources of dietary salt (WHO, 2006). Often, in countries where processed foods are the main

contributors, food reformulation, policy developments, and environmental changes have been favoured. In populations with high discretionary salt use such as China, consumer awareness and education has been successful (Liu, Li, Hong, & Yin, 2015). The implementation of consumer awareness concentrates on increasing knowledge and encouraging behavioural change, illustrating the vital role that health promotion plays in this strategy. In the South African context there are economic, religious, and cultural barriers to achieving salt reduction through behaviour changes, and these need to be considered when developing consumer awareness programmes (Eksteen & Mungal-Singh, 2015).

1.2 Rationale for research

South Africa is burdened by a high incidence of NCDs, with CVDs being responsible for 18% of all annual deaths. According to WHO, in South Africa, NCDs are responsible for 46% of all deaths (WHO, 2014a). The average daily salt intake of South Africa is amongst the highest in the world, with adults consuming between 7.8 and 9.5g daily (Charlton et al., 2005). In response to this, the South African government has implemented salt reduction legislation, with salt targets to be achieved in two phases (Department of Health, 2013). Food reformulation addresses 54% of the salt introduced into the South African diet through processed food. Furthermore, discretionary salt use accounts for between 33% and 46% of all salt consumed (Charlton et al., 2005). Due to this high discretionary salt use, there is also dire need for consumer education and awareness at both national and community levels as part of non-pharmacological interventions.

1.3 Field of study

Traditionally the role of pharmacist has been limited to the control and provision of medicines (Higgins & Field, 2012; Thamby & Subramani, 2014; WHO, 1997). There has recently been a shift in that paradigm, with pharmacists' potential as educators and communicators becoming increasingly recognised (Tsuyuki & Schindel, 2008). In the communities they serve, pharmacists are now often seen as the first line of call for medical or health related advice, which provides them an excellent platform for health promotion (Crawford, 2005; Smith, Giuliano, & Starkowski, 2011). Through health promotion activities, pharmacists play a crucial part in shifting the primary focus from treatment of diseases to disease prevention, particularly in relation to NCDs through the prevention of lifestyle risk factors (Awad & Abahussain, 2010; Probst-Hensch, Tanner, Kessler, Burri, & Künzli, 2011). This research falls under health promotion in Pharmacy Practice.

1.4 Study aim and objectives

The aim of this study is to identify dietary salt related knowledge and practices of cooks and guardians at two Community based organisations (CBOs), and to subsequently develop and implement an educational intervention promoting dietary salt reduction.

1.4.1 Phase 1: Needs assessment objectives

I. To identify practices of the cooks and document the salt content in the processed foods consumed at the two CBOs.

II. To identify the knowledge and practices of the cook(s) and guardians at the two CBOs towards dietary salt reduction.

1.4.2 Phase 2: Educational intervention objectives

III. To develop culturally appropriate and context specific dietary salt reduction HILs for cooks and guardians at the two CBOs.

IV. To test the culturally appropriate and context specific dietary salt reduction HILs designed for cooks and guardians at the two CBOs.

V. To conduct educational interactive sessions on *Salt and my Health*; *Reducing salt in my diet*; and *Reading food labels* at the two CBOs.

1.5 Research questions

The following research questions, established from the aim and objectives, will guide this project:

- What are the various foods used in these CBOs and what is their salt content?
- What are the knowledge and practices of the cooks and guardians at both CBOs towards dietary salt reduction?
- Can culturally appropriate and context specific educational intervention be implemented to address the identified gaps in knowledge?
- Can culturally appropriate and context specific salt reduction health information leaflets be developed using a participatory approach?

1.6 Overview of chapters

Introduction

This research consisted of two phases - an explorative needs assessment phase and the educational intervention - and will be presented using the Introduction, Method, Results and Discussion (IMRAD) structure. The literature review is followed by the methodology, results, and discussion of the two phases, each presented separately. The conclusion is based on both phases of this study.

Chapter 2: Literature review

Chapter 2 consists of the literature review and details the burden of NCDs globally and in South Africa, as well as the various strategies implemented to combat the problem of NCDs. The effects of salt on health are then introduced, followed by the beneficial effects of dietary salt reduction. There is a presentation of the three main recommended salt reduction strategies and salt reduction efforts implemented in South Africa. The global progression of Health Promotion is then documented, followed by its current positioning within the South African context. The factors influencing the development of written materials are also presented.

Chapter 3: Phase 1 Needs assessment

In Chapter 3A, the methodology employed in this current study is explained. This includes a description of the study setting, study participants, ethical considerations, data collection methods, and the sequence in which data collection was conducted. It also includes a description of the theories and models used and details the data analysis.

In Chapter 3B, results obtained from phase 1 of this study are presented both qualitatively and quantitatively. Phase 1 results reported are the observations made during the observational phase and the semi-structured interviews that reflect the knowledge and practices of the participants.

Chapter 3C, the discussion, is where the results from this phase of the study are considered in relation to existing findings in literature.

Chapter 4: Phase 2 Educational intervention

Chapter 4A presents the methodology used in the educational intervention. It also details the conceptualisation, design, and evaluation of the salt reduction health information leaflets developed and used during the educational intervention.

In Chapter 4B, the results from the readability tests, Suitability Assessment of Materials (SAM), Patient Education Materials Assessment Tool (PEMAT)-actionability, and qualitative formative feedback obtained during the development of the HILs are presented.

Chapter 4C discusses the results of the educational intervention.

Chapter 5 consists of an overall conclusion and recommendations for future research.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

In this chapter the topic of non-communicable diseases and the preventative measures both globally and in South Africa is discussed. The effects of salt on health and the benefits of dietary salt reduction are then introduced. This is followed the presentation of salt reduction strategies, the progression of health globally and in South Africa and lastly, the development of written health promotion materials.

In this study, the literature review was conducted through an initial review of online resources on health promotion and dietary salt reduction literature accessible from the World Health Organisation, Medical Research Council of South Africa, South African National Department of Health and the Centers for Disease Control and Prevention. Accredited journals such as *The Lancet*, were also used as sources of information. Following the snowball method, subsequent references were gathered over the course of the study.

2.2 Non-communicable diseases

Non-communicable diseases (NCDs) are defined as chronic diseases that cannot be transmitted from one person to another, and predominantly affect low to middle income countries (WHO, 2010) . The four main NCDs that contribute to mortality are: cardiovascular diseases, diabetes, chronic respiratory diseases, and cancers. Factors such as genetics, old age, unplanned urbanisation, and unhealthy lifestyles exacerbate the incidence of NCDs (WHO, 2015).

Globally, NCDs are the leading contributors to morbidity and mortality rates (WHO, 2014b). 68% of global deaths can be attributed to NCDs. An astounding 82% of these occur in Low and Middle Income Countries (LMIC), contrary to the misconception that they are confined to developed countries. According to WHO estimates, there will be a 17% increase in NCD associated deaths over the next decade (WHO, 2012a). An estimated 75% of the consequences of NCDs could be prevented through adequate management of four modifiable risk factors: tobacco use; harmful alcohol use; unhealthy diets; and sedentary lifestyles. Unhealthy diets are those high in sugars, fats, and salt (WHO, 2013a).

According to an international World Economic Forum survey, NCDs are one of the leading threats to economic growth (World Economic Forum, 2010). The escalating mortality and continued disability caused by NCDs economically impact families, industries, and

governments through losses in productivity, revenue, and capital formation (WHO & World Economic Forum, 2011). Over 9 million NCD related deaths occur before the age of 60, drastically affecting the economically active age group (15-64 year olds). This results in increased healthcare costs and leads many families to destitution. The relationship between poverty and NCDs is cyclical, with one exacerbating the other (WHO, 2010).

2.3 Non-communicable diseases in South Africa

Most developing countries are faced with a dual burden of both communicable diseases (CDs) and NCDs (Boutayeb, 2005).However, South Africa differs, as it is confronted by a quadruple burden of diseases, exerting pressure on an already strained public health system (Harries, Jahn, Zachariah, & Enarson, 2008). 44% of the total annual deaths in South Africa are attributed to NCDs, with cardiovascular diseases (18%) representing the highest proportion of deaths (WHO, 2014a). Approximately 33.7% of the South African adult population is known to be hypertensive, but it is expected that a significant portion of the population remains undiagnosed. Nonetheless, hypertension is the most commonly diagnosed medical condition in the country, and it is a risk factor for both cerebrovascular and cardiovascular diseases (Martín-Timón, Sevillano-Collantes, Segura-Galindo, & Del Cañizo-Gómez, 2014). NCDs have had a negative financial impact on the country. Diabetes, coronary heart disease and strokes have cost South Africa an estimated USD 1.88 billion between the years 2006 and 2015, negatively affecting the country's growth rate (Abegunde & Stanciole, 2006; Hofman, 2014)

2.4 Global prevention of Non-communicable diseases

In April 2011, African Health Ministers met and adopted the Brazzaville Declaration on Non-communicable Disease Prevention and Control in the WHO African Region 1. In this declaration, countries committed to developing integrated national action plans and to strengthening institutional capacities for the prevention and control of NCDs.

The First Global Ministerial Conference on Healthy Lifestyles and Non-communicable Disease Control in Moscow in April 2011 saw over 90 Ministers of Health from member states declare that health for all could not be attained without intensive global and national efforts to address NCDs. The Moscow declaration stated that:

"A paradigm shift is imperative in dealing with NCD challenges, as NCDs are caused not only by biomedical factors, but also caused or strongly influenced by behavioural, environmental, social and economic factors."

All leaders present pledged to employ a 'whole government' approach to address the issue of NCDs, rather than to deploy the respective Ministries of Health to work in isolation (National Department of Health, 2013).

The 2011 United Nations General Assembly saw the drafting of the Political Declaration of the United Nations High Level Meeting on NCDs as a commitment to address the global burden of NCDs. This marked the second time in history that a health issue was the focus of a General Assembly meeting – the first addressed the HIV/AIDS pandemic in 2000. A primary goal of the Summit was to encourage all member states to adopt an official NCD action plan in response to the epidemic increase of NCD prevalence in Low and Middle Income Countries (LMICs). The resultant framework includes 9 Voluntary Targets and 25 indicators for the prevention and control of NCDs, directed at tackling the global burden of NCDs by 2025. This included the target to reduce the global mean population's relative salt consumption to less than 5g/day by 2025 (WHO, 2016a).

The Sustainable Development Goals (SDGs) were conceptualised in 2012 at the United Nations Conference on Sustainable Development. They were set to supersede the Millennium Development Goals (MDGs), and comprised of 17 interrelated goals to be attained globally by 2030. These goals addressed climate change, poverty, inequality, injustice, and health (UNDP, 2016). The third SDG is "Ensure healthy lives and promote wellbeing for all at all ages," with objective 3.4 being to reduce NCD related deaths by one third by 2030 (WHO, 2016d).

2.5 Addressing non-communicable diseases in South Africa

The South African Summit on the Prevention and Control of Non-Communicable Diseases in September 2011 was hosted by the South African Minister and Deputy-Minister of Health. The aim of the summit (held shortly before the UN General Assembly) was to engage with key stakeholders and to map out strategies to combat NCDs in South Africa. These stakeholders included medical doctors, government officials, and members of the public living with NCDs. A unanimous decision was made by all stakeholders to adopt the 'South African Declaration on the Prevention and Control of Non-Communicable Diseases'. Ten targets were developed to reduce NCDs by 2020, including reducing the mean population intake to less than 5 grams per day (National Department of Health, 2013).

The 'Strategic Plan for the Prevention and Control of Non-Communicable Diseases 2013-17' was published by the Ministry of Health in 2013. This document contains a framework to

guide the implementation of strategies in order to meet ten targets set in 2011, and intermediate goals to reduce NCD related mortality and morbidity rates between 2013 and 2017. The Ministry of Health strongly advocated for multi-sectoral collaborations in order to combat NCDs. The strategic plan was comprised of 3 major components, with one being the prevention of NCDs and promotion of health and wellness at population, community, and individual levels. The proposed plans to meet the target, 'to reduce mean population intake of salt to less than 5 grams' included passing regulations on the salt levels found in processed foods, monitoring salt content in regulated foods, and introducing a public awareness campaign focused on salt reduction (National Department of Health, 2013).

Table 1: Comparison between the nine global voluntary targets and the South African 2020 targets

	9 global voluntary targets 2025 (WHO, 2012b)	**2017 intermediate South African targets** (National Department of Health, 2013)	**South African 2020 targets** (National Department of Health, 2013)
1	To decrease premature mortality from NCDs by 25%	Reduction by 5% in premature mortality from NCDs.	Reduce by at least 25% the relative premature mortality (under 60 years of age) from NCDs.
2	To reduce salt intake by 30%	Mean population intake of 7 grams/day.	Reduce mean population intake of salt to < 5grams/day.
3	To decrease physical inactivity by 10%	-	Increase the prevalence of physical activity (defined as 150 minutes of moderate-intensity physical activity per week, or equivalent) by 10%.
4	To reduce raised blood pressure by 25%	-	Reduce the prevalence of people with raised blood pressure by 20% by 2020 (through lifestyle and medication).
5.	To reduce the harmful use of alcohol by 10%	19 L/adult	Reduce by 20% the per capita consumption of alcohol by 2020.
6.	To have a 0% increase in Diabetes and or obesity	3% decrease of obesity across all age groups.	Reduce by 10% the percentage of people who are obese and/or overweight by 2020.
7	To have a 30% relative reduction in prevalence of current tobacco use in persons aged 15+ years	Reduction of 10% in the use of tobacco.	The reduction of tobacco use by 20%
8	To have 50% of eligible people receive drug therapy and counselling to prevent heart attacks and strokes	-	Increase the percentage of people controlled for hypertension, diabetes and asthma by 30% by 2020 in sentinel sites.
9	To have 80% availability of essential medicines and affordable basic technologies for the treatment of NCDs for all	15% decrease in stock-outs and 90% availability of essential equipment.	-

2.6 Salt and health

Salt is the common name of the nutrient made up of the elements sodium and chloride, combined in a 40%:60% proportion (AHA, 2014), and is used as a texturiser, preservative, flavour enhancer, and fermentation regulator in food processing (Doko Jelinić, Nola, & Andabaka, 2010). In the human diet, salt is the source of approximately 90% of sodium (He, Campbell, & MacGregor, 2012). In small quantities, the sodium ion is involved in homeostatic processes and nerve impulse transmissions in the human body (Brenner & Rector, 2008). Within its homeostatic role, the sodium ion regulates the volume of extracellular fluid, which in turn influences the volume of blood in circulation and, ultimately, blood pressure (Kirby & Johnson, 1992). Research has established that 1.7 million of all global NCD related deaths in 2010 were attributed to excessive consumption of dietary salt (WHO, 2014b). Kotchen, Allen, Cowly, and Frohlich (2013) reported that adverse effects on multiple target organs and tissues, such as kidneys and the heart, independent of raised blood pressure, can also be attributed to excessive salt consumption. High salt consumption also increases the risk of left ventricular hypertrophy (Perry, 2000). Furthermore, there is an increased risk of stomach cancer (Wang, Terry, & Yan, 2009), renal disease (Boero, Pignataro, & Quarello, 2002; Swift, Markandu, Sagnella, He, & MacGregor, 2005), and osteoporosis (Devine, Criddle, Dick, Kerr, & Prince, 1995) associated with excessive salt intake.

2.7 Effects of dietary salt reduction

According to recommendations made by the WHO, adults (i.e. people over the age of 16 years old) should restrict their dietary salt intake to less than 5 g/day. Daily salt intake in this lower range has been shown to be greatly beneficial to the reduction of diastolic and systolic blood pressure, and subsequently lowers the risk of developing NCDs associated with excessive salt intake (WHO, 2014c). According to Strazzullo, D'Elia, Kandala, and Cappuccio (2009), reduction of dietary salt intake to less than 5 g/day could result in a 17% decrease in the risk of cardiovascular diseases, and a 23% decrease in the risk of strokes. This is further substantiated by results obtained from a community-based randomised trial in Ghana to monitor the effects of salt reduction on blood pressure, which showed an average decrease of 2.54 mm Hg in systolic blood pressure, and a 3.95 mm Hg average decrease in diastolic blood pressure in the intervention group (Cappuccio, Kerry, Micah, Plange-Rhule, & Eastwood, 2006).

2.8 Global salt reduction initiatives

The WHO has recognised dietary salt reduction as a 'best buy' strategy for addressing the problem of NCDs. Best buys are achievable, cost-effective, evidence-based interventions applicable for implementation in LMIC with 'constrained' health care systems (WHO, 2011).To achieve population-wide salt reduction, the WHO has recommended that the Three Pillars of Salt Reduction be implemented by member states: product reformulation, consumer awareness and education, policy development and environmental changes. Product reformulation comprises of the reduction of salt content in processed food to set targets, and is achieved through partnerships with governments and other key stakeholders through either voluntary or mandatory efforts (WHO, 2013c). In populations where processed foods are identified as the main contributor of salt in the diet, reformulation is the main strategy. Environmental changes focus on developing environments where healthy food options are easily available and affordable (WHO, 2006). The table below documents countries that have initiated salt reduction.

Table 2: Global examples of salt reduction initiatives

Country	Major Source	Key players	Pillar of salt reduction used
Germany (European Commission, 2012)	Processed food	• National agencies • Government • Food manufacturers	• Consumer awareness campaigns • Food reformulation
Italy (WASH, 2015)	Processed food	• NGOs • Government • Food manufacturers	• Consumer awareness campaigns (Galeone, Spizzichino, & Giaccio, 2007) • Food reformulation • Food labelling
Japan	Discretionary	• NGOs • Government	• Consumer awareness campaigns (Kawano & Ando, 2007)
France	Processed food	• NGOs • Government • Food manufacturers	• Consumer awareness campaigns (WHO, 2007)
UK	Processed food	• NGOs • Government • Food manufacturers	• Consumer awareness campaigns • Food reformulation • Food labelling (FSA, 2014)
USA	Processed food	• NGOs • Government • Food manufacturers	• Consumer awareness campaigns • Food reformulation • Food labelling (IOM, 2010)
Brazil	Discretionary	• NGOs • Government • Food manufacturers	• Consumer awareness • Food reformulation (Nilson, Jamie, & Resende, 2012)
India	Discretionary	• NGOs • Government	• Planning on implementing consumer awareness campaigns (Mohan & Prabhakaran, 2013)

2.9 South African population salt intake

The South African population has a high dietary intake of salt, with the average adult consuming between 7.8g and 9.5g of salt per day, across different ethnic groups (Charlton et al., 2005). Preliminary results from the SAGE-South Africa cohort conducted amongst randomly selected households revealed that 69% of the participants' daily intake was over the recommended 5g/day, with 40% of young adults consuming over 9g/day (Schutte, Ware, Charlton, & Kowal, 2016). A study conducted at the North West University revealed that 65.6% of the study population's daily salt intake was greater than 6g (Swanepoel, Schutte, Cockeran, Steyn, & Wentzel-Viljoen, 2016) .

A study of the South African population found that processed food accounts for an average of 54% of dietary salt. Bread, margarine, boerewors, and soup powder were identified as the main processed contributors of salt, as they are the most frequently consumed foods (Wentzel-Viljoen, Steyn, Ketterer, & Charlton, 2013). Salted seasonings such as flavour enhancers, soup bases, and stock cubes are economical sources of salt and are frequently consumed in low income households (Charlton et al., 2005; Heart and Stroke Foundation South Africa, 2014a). The addition of Monosodium Glutamate (MSG) containing flavourants is common practice in the black majority and is a main contributor to their high salt intake (Charlton, Webster, & Kowal, 2014).

Discretionary salt use within the South African population is significantly high, contributing between 33% and 46% of salt in the diet. This is due to habits such as the addition of salt during meal preparation and at mealtimes, and the preference for salty tasting foods amongst people of different ethnicities (Charlton et al., 2005).

2.10 South African salt reduction strategies

Salt reduction endeavours in South Africa were initiated through research conducted in the mid-2000s. Subsequent engagement between academics, NGOs, and the government resulted in salt reduction policy directives. Industry consultations commenced with the baking industry (Hofman & Tollman, 2013).

In 2013, the Department of Health Directorate published new salt reduction regulations, added to the South African Foodstuffs, Cosmetics, and Disinfectants Act of 1976 (R214:20). This legislation was aimed at regulating South African food manufacturers. The first phase of legislative requirements was set into effect on 30 June 2016, and the second will be implemented on 30 June 2019 (National Department of Health, 2013). Mandatory guidelines

for salt levels were set for specific foods with high consumption rates, such as bread and soup mixes, and spreads such as margarine and butter. In so doing, South Africa committed to food reformulation as a strategy to implement dietary salt reduction, and became the first country to implement mandatory salt reduction across the food manufacturing sector (Charlton et al., 2014).

Due to the high use of discretionary salt by the South African population, consumer awareness and education has been implemented. Salt Watch was established in 2013, with its main purpose being to conduct national salt reduction awareness campaigns. The group, comprised of various stakeholders and the Heart and Stroke Foundation (HSF), was elected to be the implementing body of the campaigns and was endorsed by the National Department of Health (Eksteen & Mungal-Singh, 2015).The Heart and Stroke Foundation of South Africa (HSFSA) hosted a multi-stakeholder meeting in September 2016 to discuss the progress of salt reduction strategies in South Africa (Webster et al., 2016).

2.11 Health promotion

In 1978, the Alma-Ata Declaration was signed at the International Conference on Primary Healthcare. The focus of this conference was the protection and promotion of health as a fundamental human right. The resultant Declaration was in recognition of the need for and importance of health promotion in public health and primary health care, and served as the foundation of health promotion (WHO, 1978). Subsequently, at the first International Conference on Health Promotion, the Ottawa Charter of 1986 was signed. This Charter further recognised the value of health promotion by establishing a conceptual framework for health promotion activities, and highlighted health as a fundamental social goal (WHO, 1986). Both the Declaration and the Charter recognised that factors such as environment, socio-economic status, the health care sector, and culture influence individuals.

The WHO defines health promotion as: *'The process of enabling people to increase control over and to improve their health such that a state of complete physical, mental and social wellbeing is achieved'* (WHO, 1986). Health promotion plays an imperative role in equipping people with the necessary tools to exercise control over their physical, mental, and social wellbeing (WHO, 2009). Health promotion highlights the need for health education and communication aimed at social and behavioural change in communities. Health promotion facilitates personal and social development as well as the community empowerment through

the acquisition of indispensable knowledge and skills to manage their health (National Department of Health, 2015; WHO, 2009).

2.12 Health Promotion in South Africa

The broader concept of promoting health has existed in South Africa both during and after the apartheid era, with health promotion entering the health care system in 1990 (Coulson, 2000). Previously, health promotion in South Africa was solely focused on health education although there has been a gradual progression into a broader programme encompassing education, research, legislation, policy coordination, and community development (Department of Health, 2014). Presently, the Directorate of Health Promotion is situated within the Social Sector Cluster (SSC) under Primary Health Care (PHC). Provincially, there are Health Promotion Focal Persons. Health Promotion is one of the principal pillars in PHC intended to address former health inequalities. Health promotion efforts in South Africa are grounded on inter-sectoral collaborations between the government, NGOs, CBOs, and academic institutions (Onya, 2007).

2.12.1 Health promotion policies in South Africa

The African National Congress (ANC) health policy document contained the first noteworthy policy concerning health promotion in South Africa. Based on national and international policy processes, the document acknowledged that health promotion could significantly improve the health of the South African population and PHC (ANC, WHO, & UNICEF, 1994). In 1997, the white paper on the transformation of health services published and highlighted the political and structural changes introduced through the democratic transition, reconstruction and development, and the values expounded by the Reconstruction and Development Programme (RDP) as being essential foundations for developing the needed health promotion initiatives (Department of Health, 1997). The development of public policies and legislation, community action, skills development, the promotion of healthy physical and social environments, and empowerment of communities and individuals were identified as necessary to achieve a successful health promotion strategy (Department of Health, 1997). Health promotion has remained a priority, with its inclusion in several policies and legislation such as the 10 Point Plan (National Department of Health, 2010) and the Negotiated Service Delivery Agreement (NSDA) (Department of Health, 2010). The Health Promotion Policy was informed by numerous international and regional declarations, national policy, and legislative mandates (Department of Health, 2014).

The South African National Health Promotion policy acknowledges that health promotion plays a role in reducing NCD related mortality and morbidity. The Department of Health (2000) states that educational activities provided on NCDs in PHC facilities should be culturally and economically sensitive. The decrease in dietary salt could therefore be achieved directly by using health promotion to increase healthy behaviours and, indirectly, by facilitating positive changes in a community's perception of risk factors and by promoting self-efficacy concerning health (Department of Health, 2014).

2.13 Health promotion of salt reduction in South Africa

A four month awareness campaign to address individuals' salt-related behaviours was implemented by Salt Watch in 2014. The campaign comprised of advertising through media channels such as television and radio complemented by health professional and media engagement. It also included development of educational salt reduction materials (Webster et al., 2016). Evidence from research conducted in South Africa shows that salt reduction programmes currently being implemented are successful (Cogswell, Mugavero, Bowman, & Frieden, 2016). Wentzel-Viljoen, (2016) has reported that, as a result of the campaign, there is a significant improvement in knowledge, attitudes, and behaviours with respect to excessive salt intake and health, in turn potentially improving the population's health literacy in that regard

2.14 Health literacy

Estimates in 2011 posited that 774 million adults worldwide lacked basic literacy skills. Of this illiterate adult population, 66% are female. In Sub-Saharan Africa, 59% of the adult population (68% men and 52% women) are literate (UNESCO Institute for Statistics, 2013). In South Africa, 18% of the population has not received formal education, with 41% only having received schooling until primary school and 20% having attained secondary school education. Although 93% of the South African adult population is literate (UNESCO Institute for Statistics, 2013), general literacy does not directly translate to health literacy, despite its influences on it (WHO, 2013b).

Health literacy is defined as: 'the degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions'(Nutbeam, 1998). Individuals with limited health literacy skills have poorer health statuses (Baker, Parker, Williams, Clark, & Nurss, 1997; Weiss, Hart, McGee, & D'Estelle, 1992) , poor adherence of medical regimes, poor understanding of medical

information and lack of self-empowerment (Ross, 2007; Williams, Baker, Parker, & Nurss, 1998). Persons with low literacy and health literacy are reliant on verbal information and are often incapable of using health education materials such as pamphlets (Nutbeam, 2000; Weiss, Hart, McGee, & D'Estelle, 1992). Health literacy plays a significant role in disease prevention (Howard-Pitney, Winkleby, Albright, Bruce, & Fortmann, 1997) and influences self-management and self-care, which are of the utmost importance, particularly in the case of NCDs (Williams et al., 1998). According to Howard-Pitney et al. 1997), the consideration of health literacy in nutrition education programmes positively shapes participant outcomes. Health literacy influences the adoption of healthy lifestyles, as people need to use and understand written health information provided to them in order to make any decision to change (U.S. Department of Health and Human Services, 2016).

2.15 Health promotion written materials

Written health information, in various forms (Sabogal, Otero-Sabogal, & Pasick, 1996), has been extensively used in health education and promotion (Austin, Ahmad, McNally, & Stewart, 2002; Badarudeen & Sabharwal, 2010; Francis, Wood, Simpson, Hood, & Butler, 2008; Aileen McIntosh & Shaw, 2003; Wao, Aluoch, Wright, & Rodriguez, 2014; Whittingham, Ruiter, Castermans, Huiberts, & Kok, 2008).It is often used as a primary teaching aid or to reinforce information delivered verbally (Shieh & Hosei, 2008). HILs have been a primary strategy to improve knowledge in health education (Renuka & Pushpanjali, 2013). Due to their potential to influence changes in health knowledge, attitudes, and practices, HILs have been used in various studies aimed at raising awareness of specific health topics (Kulukulualani, Braun, & Tsark, 2008; Paul, Redman, & Sanson-Fisher, 2004). As stated in the Information Processing Model, for written health material to be effective, it must attract readers' attention and allow them to take note of the messages being delivered. Exposure to information increases the reader's awareness. The reader's understanding of the message has the potential to increase their knowledge on the subject matter. Changes in knowledge may influence attitudes however (Flay, DiTecco, & Schlegel, 1980); the behavioural change process is complex and is influenced by various mitigating factors. Thus changes in knowledge do not directly translate to changes in behaviours(Gross, 2012)..

In designing leaflets, the ethnicity and culture of the target group should be considered by using appropriate language, and by showing sensitivity to their knowledge and health beliefs (Zakrzewska, Leeson, McLuskey, & Vickers, 1997). The customisation of written health education materials to the target audience's level of literacy is imperative as this can

influence health literacy (Badarudeen & Sabharwal, 2010). Overlooking factors such as readability, design, and suitability of information adversely affects the quality of health information materials developed (Kenny et al., 1998; Lake et al., 2007). Some of the advantages of using HILs are that their production and size allows for them to be easily distributed and it also allows readers to retain them for future reference - making the reinforcement of ideas possible (Department of the Army Headquarters, 1983).

2.15.1 Readability

Readability testing is an objective measure of the reading skill and level required for one to understand written text (Albright et al., 1996). Readability formulae are mathematical formulae that use different parameters to determine the complexity of written text. The tests use varying parameters such as language complexity, sentence length and the number of polysyllabic words to output the corresponding requisite educational level or numerical score (Fry, 2002; McLaughlin, 1969). There are numerous readability formulae available, with those such as the Simple Measure of Gobbledygook (SMOG), Flesch-Kincaid Grade Level (FKGL), Automated Readability Index (ARI) and the Coleman Liau Index (CLI) calculating readability scores as grade levels (Coleman & Liau, 1975; Kincaid JP, Fishburne, Rogers, Chissom, & Millington TN: Navy Research Branch, 1975; McLaughlin, 1969). Although it is often disregarded, assessment of readability is an essential step in the development of written health information materials as it influences its comprehension and helps to identify the most appropriate materials for a readers abilities (Doak, Doak, & Root, 1996; Friedman & Hoffman-Goetz, 2006). The recommended readability for health education materials is between the 5^{th} -6^{th} grades (Estey, Musseau, & Keehn, 1991; Griffin, MacKenna, & Tooth, 2003).

2.15.1.1 The Simple Measure of Gobbledygook (SMOG)

The Simple Measure of Gobbledygook was developed by McLaughlin and provides an estimate of years of education required to comprehend written information (McLaughlin, 1969). Due to its accuracy and convenience, the SMOG is widely used to assess the readability of health education materials and is recommended by the U.S. National Cancer Institute. The SMOG has been used to assess materials covering a range of subjects from oral health (Lewis & Newton, 2006), cholesterol education (Karen Glanz & Rudd, 1990) and cancer (Friedman & Hoffman-Goetz, 2006; Guidry, Fagan, & Walker, 1998).

2.15.1.2 Flesch-Kincaid Grade Level

The Flesch-Kincaid Grade Level (FKGL) is an adaptation of the Flesch Reading Ease (FRE), producing readability scores as grade levels based on the mean number of syllables per word and the mean number of words per sentence (Kincaid, Fishburne, Rogers, Chissom, & Millington TN: Navy Research Branch, 1975).

2.15.2 Suitability Assessment Tool

The Suitability Assessment of Materials (SAM) tool is a validated subjective instrument used to systematically and objectively assess educational materials for specific target audiences (Doak, Doak, & Root, 1996). Suitability is an essential characteristic of written health information as it helps to determine if the information will be understood by the intended users particularly those with low literacy (Nasser, Mullan, & Bajorek, 2012). The SAM tool aids in rating materials based on the following six factors: content, literacy demand, graphics, layout and typography, learning stimulation and motivation, and cultural appropriateness (Vallance, Taylor, & Lavallee, 2008). It assists reviewers in highlighting the positive elements of written material as well as those that need to be improved upon (Finnie, Felder, Linder, & Mullen, 2010).Depending on the score obtained, the material can be classified as 'Inadequate', 'Adequate' or 'Superior (Doak et al., 1996)'. It has been used in many studies to assess printed health education resources on topics such as rheumatology (Rhee, Von Feldt, Schumacher, & Merkel, 2013), orthopaedics (Badarudeen & Sabharwal, 2010), rhinology (Cherla, Sanghvi, Choudhry, Liu, & Eloy, 2012) and ophthalmology (Williams, Muir, & Rosdahl, 2016) .

Table 3: Suitability Assessment of Materials ratings

Percentage score (%)	Interpretation of SAM ratings
<39	Inadequate
49-69	Adequate
>70	Superior

2.15.3 Actionability in the Patient Educational Material Assessment Tool

The Patient Educational Material Assessment Tool (PEMAT) systematically measures the understandability and actionability of reading material. Shoemaker, Wolf, & Brach, (2014) define understandability as: "Patient education materials are *understandable* when consumers of diverse backgrounds and varying levels of health literacy can process and explain key

messages." Actionability is defined as: "Patient education materials are *actionable* when consumers of diverse backgrounds and varying levels of health literacy can identify what they can do based on the information presented.''

The understandability component of the PEMAT consists of six categories: content, word choice, use of numbers, organization, layout/design, and visual aids. Actionability is rated according to seven characteristics. The scores for both understandability and actionability are rated between 0-100%, with a high score indicating that the material is deemed understandable and actionable (Shoemaker et al., 2014).

2.15.4 Culture in health promotion

It is agreed that culture is 'learned, shared, and transmitted from one generation to the next, and it can be seen in a group's values, norms, practices, systems of meaning, ways of life, and other social regularities'(Betancourt & López, 1993; Hughes, Seidman, & Williams, 1993; Rohner, 1984). Culture can be defined by factors such as beliefs relating to personal control, communication patterns, roles played in families, spirituality or religion (Triandis & Berry, 1980) and individual, behavioural, and social characteristics that may have significant meaning, symbolism or value within a certain group of people. In different groups these factors could directly or indirectly influence health related behaviours as well as the acceptance or rejection of health promotion messages or programmes. The ability to identify and describe the culture of a particular population and understanding how it relates to health behaviour and being able to apply knowledge gained provides health promoters an opportunity to develop culturally appropriate programmes and health promotion materials. In practice, however, culture is more often assumed than assessed (Kreuter, Lukwago, Bucholtz, Clark, & Sanders-Thompson, 2003).

There are various strategies that can be applied to make health promotion programmes and materials more culturally appropriate. Peripheral strategies aim to apply the concept of cultural appropriateness through the appearance of the programme and health promotion materials. This usually involves using certain pictures, fonts, and colours that transparently communicate relevance to the particular group (Petty & Cacioppo, 1996). Having a health promotion material that visually conveys the social and cultural context of the target group makes it recognisable and comfortable (Bechtel & Davidhizar, 1999). Unlike written information, pictures and colours can be almost instantly perceived (Schiffman, 1994). Consultation of the target audience in the planning of health promotion interventions, as well

the development of written information, allows the researcher to gain an understanding of what is deemed culturally appropriate (Kreuter et al., 2003). With respect to written health information, it has been noted that the use of local phrases and images relatable to the target audience enhance cultural appropriateness (Jenkins, Fakhoury, Marzec, & Harlow-Rosentraub, 2015; Kulukulualani et al., 2008). Evidential strategies aim to increase the perceived relevance of a health concern for a particular population. Often this is epidemiological data specific to them. The inclusion of statements based on this data aims to raise awareness and perceived personal vulnerability. Sociocultural strategies involve identifying the group's cultural beliefs, context, values, and behaviours (Kreuter et al., 2003).

Evidence shows that failure to consider the cultural appropriateness in the planning of health promotion activities often renders them unsuccessful. Including information that the target audience does not find useful, excluding information the researcher finds immaterial, and not integrating the target populations' norms and values are some of the factors contributing to the failure of health promotion programmes (Kreuter & Mcclure, 2004; Kreuter et al., 2003; Thomas, Fine, & Ibrahim, 2004).

CHAPTER 3: PHASE 1 NEEDS ASSESSMENT

Introduction

This chapter contains the methodology, results and discussion of the phase 1 needs assessment.

CHAPTER 3A: PHASE 1 METHODOLOGY

3.1 Introduction

This section describes the theories and models used in the study, as well as the research approach and sampling techniques used, the research instruments and data collection procedures employed. This is followed by a description of ethical considerations, data management and analysis, and the validation methods used.

3.2 Theoretical models

Selection of an appropriate model of health instruction is the first step for design and implementation of educational programmes for health promotion (Kashfi, Khani Jeihooni, Rezaianzadeh, & Karimi, 2014). Planning models guide the researcher through the planning of health promotion interventions. Health promotion programmes conducted in a systematic manner based on models have been shown to have more successful outcomes. Planning models are advantageous because the relevant aspects of the programme are addressed systematically. Models stimulate researchers to plan in advance, and this prevents the development of ineffective programmes (Kok & De Vries, 1989; Kok & Green, 1990). Although planning models are presented systematically in a rigid manner, the planning process is iterative. All steps within a model influence each other, and findings made in one step can be used to make changes to one before or after it. As the study progresses, more ideas are generated and new knowledge about the participants, research, and theory is gained, occasionally requiring that some steps be revisited.

3.2.1 The Comprehensive Health Education Model (CHEM)

The Comprehensive Health Education Model (CHEM) was developed in the early 1970s by Sullivan. It is a more elaborate model compared to the Model for Health Education Planning (MHEP), its predecessor (McKenzie & Smeltzer, 2001; Sullivan, 1973). The CHEM consists of six steps that each have suggested actions. While working through the steps, researchers ought to think of the specific health issue to be addressed, the relationship of the behaviours associated with that health problem, the best practices and limitations of health education, and the resources required to conduct the intervention. The six CHEM steps are:

Step 1: In this step the main aim is to involve people, and it is achieved by identifying the target population - those that will assist with conducting the health promotion programme as well as individuals that will provide input throughout the process. Identified people have their specific roles assigned to them.

Step 2: The task in this step is to establish goals. The goals set are preferably outcome goals related to health education practices, health education resources, health status, and personal action.

Step 3: In this step, researchers define problems by conducting a needs assessment to determine the health status or knowledge gaps, health action gaps, and strengths and weaknesses of the environment in which the programme is conducted (McKenzie & Smeltzer, 2001)

Step 4 involves researchers designing plans. According to McKenzie & Smeltzer, (2001) designing plans includes setting operation objectives, defining a timeline, activities, and resources, as well as identifying the most appropriate approach to adopt.

Step 5 is the implementation of the designed programme. At this stage, all necessary resources have been obtained. This includes personnel, facilities, equipment, and supplies to conduct the programme. With duties defined and management policies and procedures developed, programmes are conducted.

The final step involves the evaluation of results. The programme objectives are compared with the outcomes achieved. Strengths and weaknesses of the programme are determined, along with favourable and unfavourable by-products. The data obtained is used for future decision making, with the ultimate goal being programme improvement (McKenzie & Smeltzer, 2001).

The figure below is a visual representation of the CHEM. The arrows indicate the movement between the steps of the model as research is conducted.

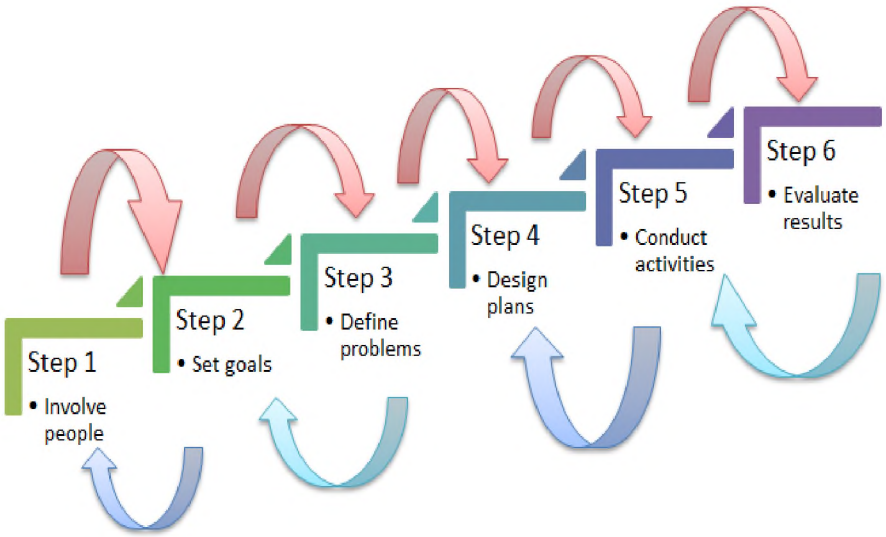


Figure 1: The Comprehensive Health Education Model (CHEM)

Table 4: Application of the CHEM summarised

Step 1: Involve people
• Met with CBOs stakeholders and they helped to identify the study participants and the CBOs liaison persons to assist with study arrangements.
Step 2: Set goals
• Finalised the aim and objectives of the study.
Step 3: Define problems
• Phase 1 of the study was the needs assessment. • Conducted participant observation and explorative SSI to identify the participants' knowledge and practices relating to dietary salt reduction. • Analysed needs assessment data and identified participants' gaps in participants' knowledge and practices.
Step 4: Design plans
• Planned phase 2 educational intervention to address identified gaps in knowledge and practices. • Used constructs of the SCT to plan content to be covered during the educational intervention. • Conceptualised HILs
Step 5: Conduct activities
• Conducted interactive educational sessions. • Participatory development of HIL drafts with participants and key role players was conducted. • Conducted participant evaluation of educational intervention. • Conducted post-intervention SSIs and participant observation.
Step 6: Evaluate results
• Evaluated results from HIL development FGDs and made modifications. • Evaluated results from participant evaluation and post-intervention observation and SSIs.

3.3 Research design

The overall study followed a qualitative study design with quantitative measuring of the readability and suitability of the HILs, guided by the Comprehensive Health Education Model (CHEM), and applied principles of community-engaged research.

3.3.1 Academic Researchers

The academic researchers were from a health background. The principal supervisor and the researcher are trained as pharmacists. They are both based at the Faculty of Pharmacy, Rhodes University.

3.3.2 Qualitative research method

Qualitative data collection was the primary method used in this study, complimented by quantitative collection in the assessment of the HILs. Qualitative data is exploratory in nature and provides the researcher with an opportunity to explore people's beliefs, emotions, and behaviours (Guba & Lincoln, 1989). Strategies that are often employed in qualitative data collection are observations and interviews, where the use of open-ended questions is applied (Creswell, 2014; Hardon et al., 2001; Koshy, Koshy, & Waterman, 2011). Quantitative methods highlight objective measurements and focus on the collection of numerical data (Babbie, 2010). Qualitative components of this study included semi-structured interviews (SSIs), focus group discussions (FGDs), and educational sessions. Data obtained through qualitative methods is thematically analysed before the presentation of results (Creswell & Plano Clark, 2011). Quantitative components included in this study were the readability tests, SAM and PEMAT scores and the comparison of pre and post intervention SSIs data.

3.3.3 Rationale for research approach

Conducting effective community engaged research is dependent on identifying academic and community partners who have common goals and work styles (Best et al., 2003; Shannon, 1989). This study incorporated some community-engaged research principles. Community engaged research is continuum based, with each level determined by the communities' level of involvement with the study being conducted. The three levels are classified as minimal, moderate, and maximal (Mcdonald et al., 2001). This current study used low-moderate community engagement, with community stakeholders assisting with participant recruitment in Phase 1, and community members being actively involved in the HIL development in Phase 2. Following this research approach was beneficial to the study, as the community's input assisted the researchers to develop culturally sensitive and contextually specific HILs.

As a result, a trusting and respectful relationship was established between the researcher and study participants.

The table below contrasts the principles of the traditional research approach and the community engaged research approach, and highlights those used in this particular study.

Table 5: Principles of community engaged research applicable to this study

	Traditional	**Community-Engaged Research**
Research objective	Based on epidemiologic data	Community input in identifying locally relevant issues
Study Design	Design based entirely on scientific rigor and feasibility	Researchers work with community to ensure study design is culturally acceptable.
Recruitment and Retention	Instruments adopted/adapted from other studies. Tested chiefly with psychometric analytic methods.	Instruments adopted from other studies & tested/adapted to fit local populations.
Data Collection	Conducted by academic researchers or individuals with no connection to the community	Community members involved in some aspects of data collection.
Analysis & Interpretation	Academic researchers own the data, conduct analysis and interpret the findings	Academic researchers share results of analysis with community members for comments & interpretation.
Dissemination	Results published in peer-reviewed academic	Results disseminated in community venues as well as peer-reviewed journals.

3.3.4 Research setting

The main study was conducted at two CBOs: St Mary's Development and Care Centre (St Mary's DCC) and the Assumption Sisters Nutrition Centre (ASNC) in Grahamstown. The pilot study was conducted at Oasis Grahamstown, another local CBO. The city of Grahamstown is located in the Makana Municipality in the Eastern Cape Province of South Africa (Statistics South Africa, 2012). The Eastern Cape Province is the second poorest province in the country, with an unemployment rate of 28.6% (Statistics South Africa, 2016). Grahamstown has a population of 50 217, with 72.8% of the population being black. The population is made up of predominantly IsiXhosa (66.5%) and Afrikaans (17.3%) first language speakers (Statistics South Africa, 2012). Approximately 45.3% of Grahamstown households are headed by females and only 27.0% of the population having completed matric (The Local Government Handbook, 2016).

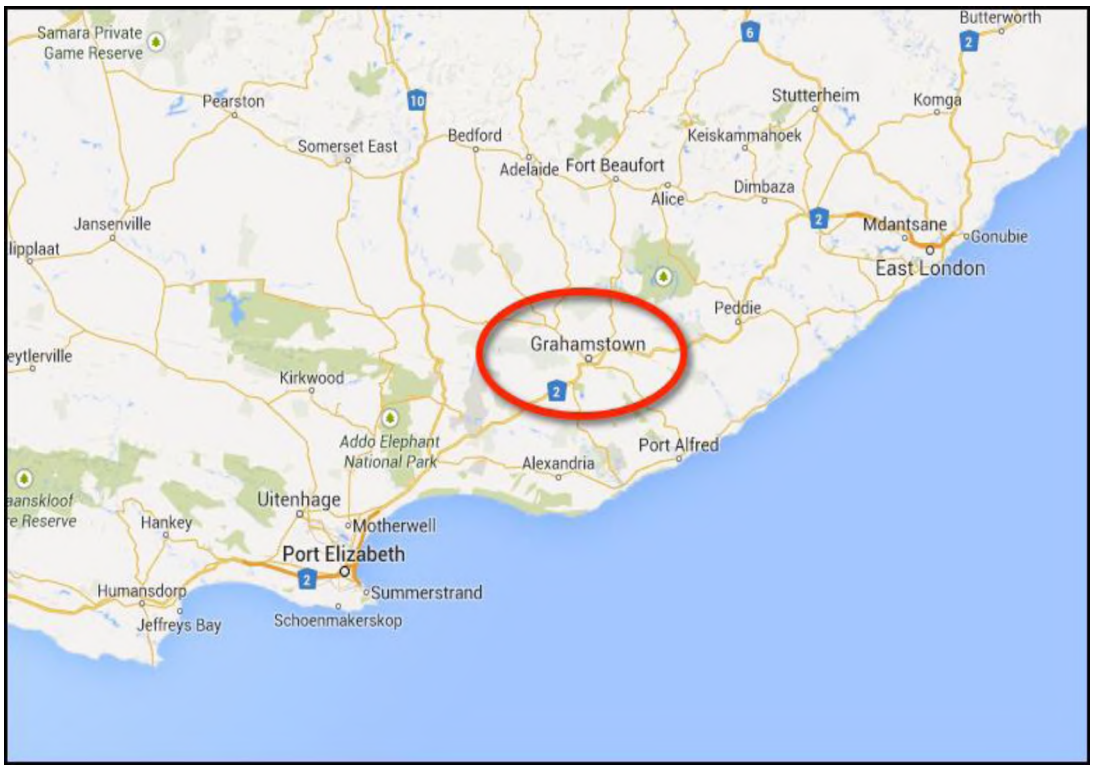


Figure 2: Map showing the location of Grahamstown

3.3.5 The community based organisations

Community based organisations are grassroots, local organizations and well positioned to assist children and families experiencing numerous day-to-day challenges (Foster, 2007). CBOs regularly partner with academic institutions to carry out research and assist with conveying new knowledge to residents in the community (Ramanadhan et al., 2012). Partnering with CBOs provides researchers with access to the community, and promotes continuity of the research (Newhall, 2013).

3.3.5.1 St Mary's Development and Care Centre

St Mary's DCC is a Catholic community-based project focused on the developmental needs of children and their families in Grahamstown. The Centre caters for one hundred children, aged 6-16 years, providing them with breakfast and lunch, and facilitating after-school programmes that aim to improve the social, emotional, and educational wellbeing of the children. The Centre is run by permanent members of staff, with assistance from community volunteers. It focuses on aiding in community development and has been involved in various community projects involving health promotion and education (May, 2015).

3.3.5.2 The Assumption Sisters Nutrition Centre

The Assumption Sisters Nutrition Centre is another Catholic run community based programme. The aim of the project is to enhance the quality of life of marginalised children from homes of low socio-economic standing. The Centre's project mainly focuses on child development and nutrition. It provides breakfast and lunch to 100 school children from the primary and high schools in the surrounding community. Meals are provided on weekdays as well as over the June and October holidays. Their afterschool programme includes assisting children with homework, the provision of additional lessons, and educational excursions. Their endeavours have extended into the community, offering short courses in areas such as gardening and financial management (ASNC, 2015).

3.3.6 Study Participants

Participants in this study were cooks and guardians drawn from St Mary's DCC and the Assumption Sisters Nutrition Centres. The inclusion criteria were that participants were either to be cooks employed by the centre or guardians living in the surrounding community with children attending the centre.

3.3.7 Study sampling

Purposive and convenience sampling techniques were applied in this study. Purposive sampling is a theoretically informed non-random technique in which a researcher has a preconceived idea of the characteristics required for the sample population (Coyne, 1997; Palys, 2008) . The predetermined characteristics are guided by the aims and objectives of the research, and thus the researcher identifies participants perceived to have experience and knowledge concerning the research questions for the most effective use of limited resources (Patton, 2002; Terre Blanche, Durrheim, & Painter, 2006; Tongco, 2007). Bernard, (2002) and Spradley, (1979) also note that in addition to being knowledgeable participants must be available and willing to participate. As qualitative research is an iterative process, it is recommended to re-sample in order to draw appropriate participants (Miles & Huberman, 1994). Convenience sampling, also referred to as opportunity sampling, is another nonprobability approach, where data collection is conducted with the nearest population members (Cohen, Manion, & Morrison, 2008; Luborsky & Rubinstein, 1995).

3.3.8 Ethical considerations

While undertaking research it is imperative that researchers respect and uphold the participants' rights (Webster, Lewis, & Brown, 2013). Ethics form the heart of all research and particular attention must be paid to them throughout a study. The following ethical considerations were made in this study:

3.3.8.1 Ethical approval

Prior to the commencement of a study involving human participants, ethical approval is required from the applicable ethics bodies. This is to protect the participants' rights while the research is undertaken (Hardon et al., 2001). Prior to starting the study, the research proposal was defended in front of and approved by the Higher Degree Committee, Faculty of Pharmacy, at Rhodes University. Ethical approval was obtained from the Faculty of Pharmacy Ethics Committee- Rhodes University (Appendix A).

Participant remuneration

Grahamstown has an unemployment rate of 32.5% and a youth unemployment rate of 42.2% (Stats SA, 2011). Based in these statistics in and irregular job opportunities a decision was made to remunerate participants for their time dedicated to the study (Webster et al., 2013) that may have otherwise been spent seeking employment. In literature there is an ongoing debate concerning the appropriateness of remunerating participants. However, when the negative aspects are managed and acknowledged they are outweighed by the positive benefits

(Wiles, Crow, Charles, & Heath, 2007). Permission to remunerate participants was sought and obtained from the Faculty of Pharmacy Ethics Committee - Rhodes University (Appendix B). Due to financial limitations, participants were given R30 shopping vouchers. Following literature based recommendations, participants were only given the vouchers were given at the end of their SSIs (Wiles et al., 2007). Participants were requested to sign as acknowledgement of receipt of the vouchers.

3.3.8.2 Non-maleficence

The Principle of Non-maleficence states that research should not cause any harm to the participants (NCESSRH, 2016). In this study, non-infliction of harm was ensured by encouraging participants to inform the researcher if they were feeling uncomfortable at any instance throughout the study. Verbal consent was also sought from participants at all stages of the study.

3.3.8.3 Confidentiality

Confidentiality in research is primarily for the protection of research participants from any harm or prejudice associated with participation in the study. Upholding confidentiality fosters trust between the participants and the researcher, and maintains good research principles (Baez, 2002). The discussion of confidentiality with participants at the onset of a study is essential for acquiring informed consent and building trust (Crow, Wiles, Heath, & Charles, 2006).

Prior to starting data collection, participants were given participant invitation letters and were informed of the aims and objectives of this study (Appendix C). The invitation letter provided information about the study and detailed the advantages of taking part in it, and clarified each participant's role as well as that of the researcher. The voluntary nature of participation in the study was emphasized to the participants. They were also informed that they could withdraw from the study at any time. Participants were issued unique participant identifiers to be used in data records to ensure the confidentiality of their personal information and their anonymity.

3.3.8.4 Informed consent

Informed consent is a core principle in social research and involves providing the participants with adequate information to inform their decision to participate or not to (Byrne, 2001). In this study participants were furnished with participant invitation letters (Appendix C) that

detailed the aims and objectives, different methods to be employed in the study and the role of the participants.

The ethical principal of informed consent is based on an individual's right to self-determination and shows respect of their dignity (Miller & Boulton, 2007). Written informed consent was obtained from all participants before commencement of the study (Appendix D). Given the dynamic nature of qualitative research consent cannot be regarded as a once-off procedure but rather as a process of continuously seeking consent from participants throughout the course of the research (Ensign, 2003; Munhall & Boyd, 1993; Polit & Beck, 2006).

3.3.9 Data collection techniques

Data collection techniques and tools used in the needs assessment phase are summarised in the table below:

Table 6: Needs assessment phase data collection techniques

Data collection technique	Research tool used
Introductory meetings	Note taking
Participant observation	Note taking Photography Audio recording
Semi-structured Interviews	Audio recording Semi-structured interview guide Note taking

3.4 Research procedures

The research procedures under taken in the needs assessment phase are detailed below:

3.4.1 Introductory meetings

Initially, separate introductory meetings were held with key stakeholders from St Marys DCC, the Assumption Sisters Nutrition Centre, and Oasis Grahamstown. The stakeholders assisted in the identification of liaison persons from both CBOs that would assist with the study and of the study's target population. A combined meeting was subsequently held where the aim and objectives of phase one of the study were explained and the roles of the centres and participants were discussed.

3.4.2 Participant recruitment

With assistance from the liaison persons from each respective CBO, meetings with guardians from the communities were conducted. The meetings served as platform to introduce the study to the community and for participant recruitment. The prospective participants were given participant invitation letters and informed consent forms which the researcher read through with them. An IsiXhosa interpreter was present to assist as the meeting was conducted in English. Interested guardians were requested to remain after the meeting to meet with the researcher. At both centres there was a poor turn out and a small number of interested of people thus a second set of meetings was conducted. After the meetings, the researcher meet with the interested guardians and cooks individually, went through the invitation letter and informed consent form and took their contact details. The participants were also informed of the prospective dates for the SSIs.

3.4.3 Semi-structured interviews question guide development

A semi-structured interview (SSI) question guide, with a combination of open and close ended questions, was developed as the primary instrument for exploratory phase data collection. The developed question guide consisted of six subsections: demographics, salt knowledge, food labels, salt and health, lifestyle and practices, and miscellaneous uses of salt (Appendix E). The quantitative section on demographics collected information on the participants' demographics such as age, highest education level, and whether any of the participants had any non-communicable diseases. Remaining sections were both quantitative and qualitative in nature. Questions were adapted from existing salt reduction questionnaires and assessed both declarative (knowledge of facts) and procedural knowledge (knowledge of processes) (AWASH, 2007; Claro, Linders, Ricardo, Legetic, & Campbell, 2012; FSA, 2009; Worsley, 2002; Wylie, Moore, & Brown, 2011).

3.4.4 Pilot testing of the semi-structured interview guide

Due to the limited number of participants at the two centres, pilot testing of the SSI question guide was conducted with employees and guardians from Oasis Grahamstown, another CBO located in Vergnoeg, Grahamstown. When using research instruments that have not been validated pilot testing is necessary (Baker, 1994). The pilot test was conducted to determine: the comprehensibility of the questions; whether the questions asked would yield the desired information; the average duration of each interview; and to establish if the participants would recommended any changes to the question guide (van Teijlingen & Hundley, 2001). Minor

changes were made to the phrasing of certain questions to improve clarity. It was noted that the interviews lasted between 15-20 minutes.

3.4.5 Observation Phase

During observation of the cooks at both centres, the researcher obtained informed consent to observe them during meal preparation. The three consenting cooks were observed on three occasions. Participants were not informed that the goal of the observation phase was to monitor discretionary salt use, to eliminate bias. Observation is used as auxiliary or supplementary to other methods of data collection, such as semi-structured interviews and focus group discussions (Terre Blanche et al., 2006). It involves the observation of participants and their environment (Gray, 2009). One shortfall of this method is that participants being aware of the behaviour observed they may change it (Merriam & Tisdell, 2015). An inventory of the food products purchased by both centres was conducted to document salt content and meal lists were collected. Photographs were also taken as part of data collection.

3.4.6 Semi-structured Interviews

A semi-structured interview is a dynamic way of collecting the data used in qualitative research, particularly during the explorative phases (FAO, 2015; Keller & Conradin, 2016). It involves the verbal questioning of participants by a researcher, facilitated by an interview question guide containing closed and open-ended questions. These provide an opportunity for participants to explain their responses in depth. SSIs can be conducted with individuals or in groups, and the inclusion of open-ended questions allows the researcher the flexibility needed to probe participants to gain further insight into their responses and views (Cohen & Crabtree, 2006).

A week before the scheduled data collection dates the researcher contacted the consenting participants telephonically or via short message service (SMS) to confirm their availability. Audio recorded SSIs, facilitated by a pre-tested question guide were conducted with 19 participants to acquire insight into their knowledge and practices towards dietary salt reduction. An IsiXhosa interpreter assisted with the interviews conducted with guardians from the ASNC as IsiXhosa was indicated as their preferred language.

3.5 Data management

The framework developed by Creswell & Plano Clark, (2011) was used to guide the analysis and interpretation of data was applied in this study . The framework consists of five steps:

a) Organising and preparing data for analysis
b) Exploring data
c) Analysis through data coding
d) Thematic coding
e) Interpretation of data

(a) Organising and preparing data for analysis

As recommended by Koshy et al., (2011) computer software was used for data analysis and management. In this study the computer software Nvivo ® 2010 was provided by the Centre for Higher Education Research, Teaching and Learning (CHERTL) at Rhodes University. Nvivo ® 2010 is a qualitative data analysis software package used in the analysis of non-numerical or unstructured data. This programme enables users to arrange information, examine relationships in the data, and to combine analyses (QSR International, 2017).

The researcher attended a one-day conference on the use of Nvivo ® 10 software, which was offered by CHERTL at Rhodes University. The audio recorded, qualitative data obtained through the SSIs was transcribed, verbatim, by the researcher. As an interpreter was used during the interviews conducted in IsiXhosa, the researcher was able to transcribe them. The transcribed data was imported into and saved in NVIVO® 2010 software.

(b) Exploring data

During the iterative exploration of data, the researcher re-read the SSI transcripts and re-listened to the audio recordings. This helped the researcher to familiarise herself with the data, ensure accuracy in transcription, and to identify keywords to guide the coding process (Creswell & Plano Clark, 2011).

(c) Analysis through data coding

Coding refers to grouping data that has the same meaning or significance (Koshy et al., 2011), and the resultant groups are referred to as nodes in Nvivo®. Coding was guided by the keywords identified during data exploration.

(d) **Thematic coding and description**

Thematic coding involves classifying or grouping data according to themes. These are patterns identified in data sets. The classification of data into these patterns can be based on a

detailed analysis of the meanings of data or by the guidance of theoretical frameworks (Creswell & Plano Clark, 2011).

(e) **Interpretation of data**

Data from the first phase was interpreted and used to determine objectives for Phase 2 of the study.

3.6 Validation of research methods

Validity in research involves using strategies that speak to possible issues in the collection, analysis, and interpretation of data that could potentially compromise the connection between the qualitative and quantitative aspects of the study and the deductions drawn from the combination (Creswell & Plano Clark, 2011).

For the research to be deemed trustworthy and valid in a wider context, it is necessary to validate the data collection method, data analysis, and interpretation (Creswell & Plano Clark, 2011)The strategies to validate data recommended will be detailed (Creswell & Plano Clark, 2011; Hardon et al., 2001; Koshy et al., 2011).

3.6.1 Member checking

-see section 4.6.1

3.6.2 Prolonged engagement with participants

Another method of ensuring the credibility of research is prolonged engagement between the researcher and participants. This is recommended to establish a relationship of mutual trust between the researcher and participants (Guba & Lincoln, 1989). Pre-study visits were made to St Mary's DCC to strengthen an existing relationship and the Assumption Sisters Nutrition Centre to establish a relationship.

3.6.3 Peer review

Peer review is the process through which either data or research is reviewed by a peer acquainted with the study (Creswell, 2014; Marshall & Rossman, 2011) It is a process that increases the validity and trustworthiness of data collected through qualitative research (Guba & Lincoln, 1989; Houghton, Casey, Shaw, & Murphy, 2013). In this study the researcher worked alongside a peer reviewer with whom interpretation of data and the research process were discussed.

3.6.4 Triangulation

Pilot & Hungler (1999) define triangulation as "the use of multiple methods or perspectives for the collection and interpretation of data for a phenomenon, in order to obtain accurate representation of reality". Using various methods of data collection enhances understanding of the research by tapping into different areas of knowledge (Foss & Ellefesen, 2002).To provide a multi-dimensional view of the dietary salt reduction study and to increase the validity of the findings, the researcher made use of methodological triangulation.

- The principal method of data collection in this phase was SSIs with participant observations as the complimentary method.
- Participant observation provided an opportunity to identify the cooks discretionary salt use practices during meal preparation.
- Data from the exploratory SSIs assisted in identifying gaps in the participants' knowledge and practices with regards to dietary salt reduction. The quantitative data obtained from pre- and post-intervention scores obtained from the SSI show the effect of the intervention on the participants' knowledge. The qualitative component of the SSIs provides a more contextual overview of the data collected.

3.6.5 External reviewers

External reviewing is the process through which non-research partners, such as peers or colleagues, based on their understanding, provide feedback on the research methodology or findings (Creswell & Plano Clark, 2011; Koshy et al., 2011). In this study, external reviewing of the methodology, data interpretation, and results was obtained through the following steps:

- Results from this research were presented at both local and national conferences, faculty and university seminars, and meetings with participants and key stakeholders (see Research outputs).
- Results from this research were also shared in a research group consisting of the principal supervisor and three peers. The research group met fortnightly, providing the researcher opportunity to discuss concepts concerning research. The peers and supervisor also served as writing respondents for abstracts and manuscripts and critiqued research-based presentations.

- The researcher attended a participatory research design workshop hosted by the Rhodes University Centre for Postgraduate Studies. This workshop helped inform the research methodology and design followed in this study.

- The researcher participated in a writing circle organised by the principal supervisor for the research group. The writing circle was facilitated by a peer from the Humanities Faculty. Abstracts, manuscripts, and thesis chapters were critiqued during these sessions.

- Two manuscripts (one based on the explorative needs assessment phase of the study) written during the course of the research were internationally peer reviewed and published in international journals (*see research outputs*).

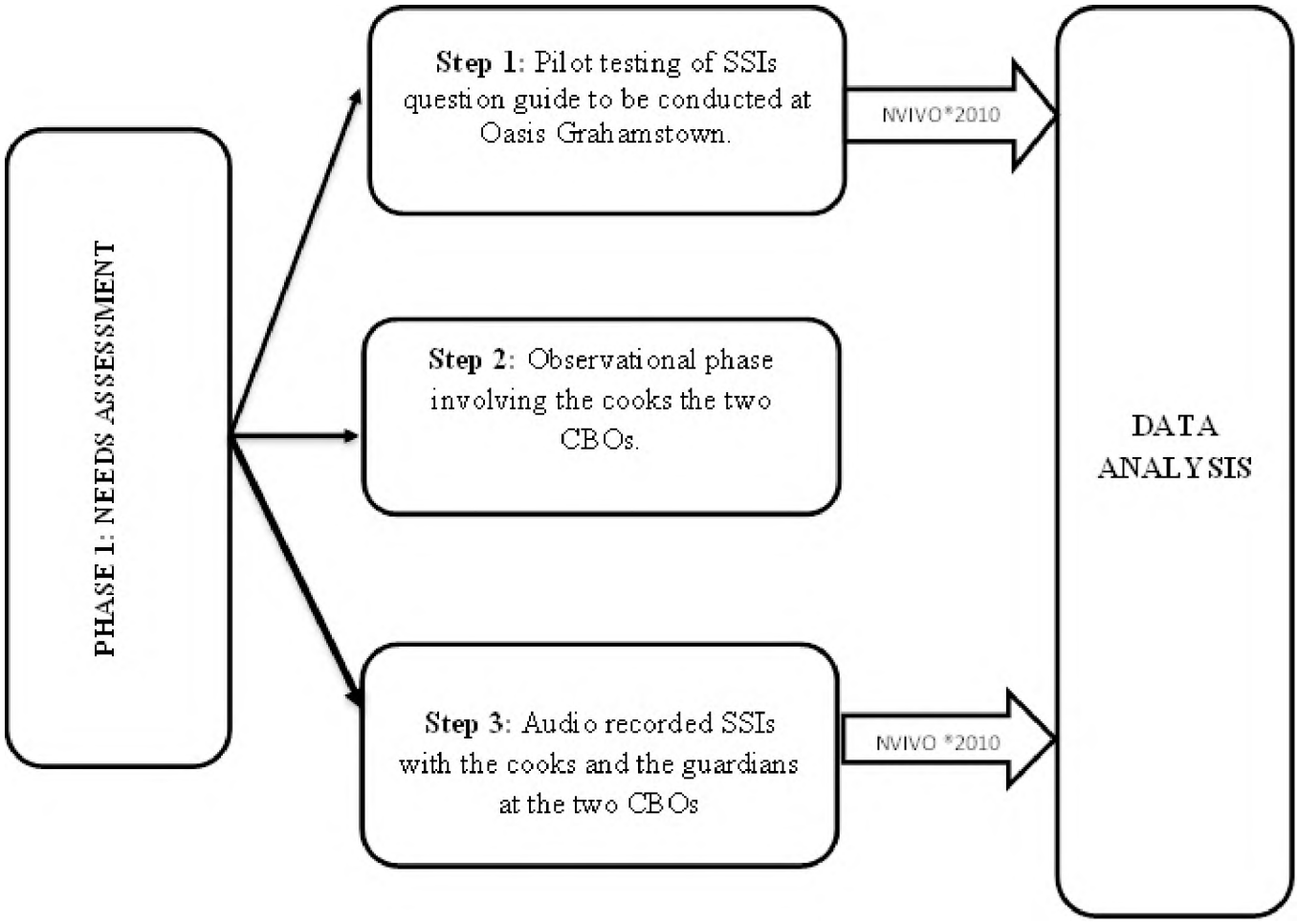


Figure 3: Phase 1 data collection process

CHAPTER 3B: PHASE 1 RESULTS

3.7 Introduction

This chapter summarizes results obtained from the observational phase and the explorative SSIs with the cooks and guardians at St Mary's DCC and the ASNC. The observational phase was conducted to identify cooks' practices with regard to the use of salt during meal preparation. During this phase, meal plans were obtained and an inventory of the foodstuffs available at the centres was conducted in order to document their salt content. SSIs were conducted with cooks and guardians to identify their knowledge and practices towards dietary salt. The SSI question-guide consisted of a combination of closed and open-ended questions, and, where necessary, probes were also used. In those instances where probes were used, the researcher merged the response from the lead question with that elicited by the probe.

The table below shows an extract from one of the SSI transcripts.

Table 7: Presentation of SSI responses

Extract of transcript from SSI with Participant B11
Researcher: "Do you know how much salt you are supposed to eat in a day?"
B11: "Yes, I know it's half a teaspoon."
R: "Where did you hear this from?"
B11: "It's one of those things I heard someone say. I can't really remember."

The participant's response will be written as:

Yes, I know it's half a teaspoon. It's one of those things I heard someone say, I can't really remember. - **B11**

3.8 Phase 1 participant demographics

Phase 1 participant demographics were obtained from the participants by the researcher before the observational Phase and SSI began. Study participants were all female (n=19), with ages ranging from 24 to 65 years, drawn from two Grahamstown communities. All participants were either first language IsiXhosa (47%) or Afrikaans speakers (53%). Thirteen of the nineteen participants reported to have a Grade 10 education level. With regards to non-communicable diseases, three of the participants were hypertensive, with one participant

reporting to be asthmatic. The table below shows the participants' demographic characteristics.

Table 8: Participant Demographics

Participant identifier	Age	Home language	Highest education level	NCDs
C1	34	Afrikaans	Grade 11	N/A
C2	37	Afrikaans	Grade 10	N/A
C3	25	Afrikaans	Grade 11	N/A
C4	42	Afrikaans	Grade 10 (Std 8)	Hypertension
C5	24	Afrikaans	Grade 10	N/A
C6	54	Afrikaans	Grade 10 (Std 8)	Hypertension
C7	29	Afrikaans	Grade 10	N/A
C8	27	Afrikaans	Grade 9	N/A
Cc1	26	Afrikaans	Grade 10	N/A
Cc2	32	Afrikaans	Grade 10	N/A
B9	51	IsiXhosa	Grade 10 (Std 8)	N/A
B10	29	IsiXhosa	Grade 10	N/A
B11	27	IsiXhosa	Grade 8	N/A
B12	60	IsiXhosa	Grade 4 (Std 2)	Hypertension
B13	42	IsiXhosa	Grade 10 (Std 8)	N/A
B14	32	IsiXhosa	Grade 10	Asthma
B15	49	IsiXhosa	Grade 10 (Std 8)	N/A
B16	65	IsiXhosa	Grade 4	N/A
Bc1	55	IsiXhosa	Grade 10 (Std 8)	N/A

3.9 Observational Phase Results

During the observational phase, the researcher noted that, at both centres, salt shakers were not available on the tables where children ate their meals. It was also observed that, at both centres, cooks used their hands to measure salt during food preparation (Figure 4). From the inventory conducted, it was evident that there was frequent and prominent use of processed foodstuffs at both centres (Table 9 and Table 10). The cooks stated that foodstuffs such as tinned tomatoes were used because of their convenience. Weekly meal plans from both centres were also obtained (Table 11 and 12).

Figure 4: Participant adding salt by hand during meal preparation

3.9.1 SSI with the cooks during observational phase

At both centres, the cooks were responsible for cooking only, while other staff members ensured that the grocery shopping was done. Bulk grocery shopping was undertaken monthly, with weekly shopping for perishables such as bread and vegetables. When asked if the children were allowed to add salt to their meals, cooks stated that children could request salt from the kitchen when required.

No, we don't put them [salt shakers]. The children do ask for salt and we give it to them if they ask. - **Cc1**

If they want it [salt], they come and get it from the kitchen. - **Cc2**

"The children are allowed to add salt but they have to ask. There is a boy who doesn't eat fish so he was asking for salt to eat with his pap. I told him salt isn't good for you when it is raw. When I turned away he came into the kitchen and he took it." - **Bc1**

3.9.2 Product documentation

The table below lists the food documented in the pantry at the ASNC.

Table 9: Food list of inventory conducted at the ASNC

Product	**Sodium per 100g**	**Sodium content classification**
Tinned tomato and onion mix	260 mg	Moderate
Cream of Tomato soup	275 mg	Moderate
Full Cream Milk	49 mg	Low
Processed peas in brine 1	405 mg	Moderate
Chick peas	240 mg	Moderate
Pilchards	265 mg	Moderate
Vitapunch c/powder	Not specified*	N/A
Bread	472mg	Moderate

*Salt content not specified on the product packaging.

The table below lists the food documented in the pantry at the St Mary's DCC

Table 10: Food list of inventory conducted at St Mary's DCC

Product	Sodium per 100g	Sodium content classification
Yoghurt	50	Low
Frozen peas	37	Low
Frozen garden peas	8	Low
Oats	19	Low
Mutton flavoured mince	4136	High
Bread	472	Medium
Baked beans	293	Medium
Vanilla muffin mix	608	High
Chutney	661	High
Mixed vegetables	372	Medium
Custard powder	62	Low
Wheat biscuit cereal	322	Medium
Mayonnaise	388	Medium
Curry	30	Low
Tomato and onion mix	6	Low

The table below shows the weekly meal plan at St Mary's DCC.

Table 11: Meal plan obtained from St Mary's DCC

	Monday	**Tuesday**	**Wednesday**	**Thursday**	**Friday**
Breakfast	Oats, yoghurt and tea.	Fruit, bacon, egg and toast.	Fruit, wheat biscuit and tea.	Pork sausage, egg, bread, yoghurt and tea.	Cornflakes, fruit and tea.
Lunch Week One	Pilchards, spaghetti and baked beans. Milk/ bread/fruit	Green beans, beef stew and rice. Milk/ bread/fruit	Cottage pie, butternut and muffin. Milk/ bread/fruit	Mac and cheese and chakalaka salad. Milk/ bread/fruit	Hot dogs and chips. Milk/ bread/fruit
Lunch Week Two	Mince curry with peas, rice and beetroot salad. Milk/ bread/fruit	Baked chicken, potatoes and chakalaka salad. Milk/ bread/fruit	Lentil curry, rice, butternut and muffin. Milk/ bread/fruit	Samp and beans. Milk/ bread/fruit	Burgers and chips. Milk/ bread/fruit
Lunch Week Three	Wors, mash with gravy and bread. Milk/ bread/fruit	Macaroni, mince and beetroot salad. Milk/ bread/fruit.	Chicken stew, mix veg, rice and muffin. Milk/ bread/fruit	Pilchards, spaghetti and baked beans. Milk/ bread/fruit	Russian, pasta salad with bread. Milk/ bread/fruit.
Lunch Week Four	Mince curry with mixed vegetables. Milk/ bread/fruit	Rice and lentil curry and butternut. Milk/ bread/fruit	Beef stew, carrots, rice and muffins. Milk/ bread/fruit	Samp and beans. Milk/ bread/fruit.	Hot dog and chips. Milk/ bread/fruit

The table below shows the meal plan obtained from the ASNC

Table 12: Meal plan from the ASNC

	Monday	**Tuesday**	**Wednesday**	**Thursday**	**Friday**
Breakfast	Mealie meal porridge Tea, bread (with margarine or jam)	Mealie meal porridge Tea, bread (with margarine or jam)	Mealie meal porridge Tea, bread (with margarine or jam)	Mealie meal porridge Tea, bread (with margarine or jam)	Mealie meal porridge Tea, bread (with margarine or jam)
Lunch	Rice, mince and mixed vegetables	Pap[2] with amasi[3] (sour milk)	Samp, cabbage and beef stew	Pap, cabbage and pilchards	Rice, beef stew and mixed vegetables
Afternoon snack	Tea, bread (with margarine or jam)	Tea, bread (with margarine or jam)	Tea, bread (with margarine or jam)	Tea, bread (with margarine or jam)	Tea, bread (with margarine or jam)

[2] Pap is a South African staple food prepare from mealie meal
[3] Amasi is sour milk served with starches such as pap

3.10 Semi-structured interview Results

These are the results obtained from the SSI conducted with Phase 1 participants, comprised of the cooks and guardians from St Mary's DCC and the Assumption Sisters Nutrition Centre.

3.10.1 Salt knowledge

Perceptions on personal salt intake

Participants were asked what they thought about their personal daily salt intake. The researcher intended to identify the participants' perceptions of their current daily salt intake. Of the total participants, 42% of the participants perceived their personal daily salt intake to be "a little''. 36% stated that they thought their intake was adequate. The remaining 21% reported that they thought their consumption was "a lot".

"'Are we talking about myself now? *Ummm, I would say a little."*- **C1**

"A little because I don't want too much, I just want the food to have taste."- **B9**

I eat a little because I have pressure [hypertension].- **B12**

Knowledge of daily recommended intake

Participants were asked if they were aware of the recommended amounts of daily salt intake. The majority did not know the daily recommendation, and, in some instances, a few did not know there was a limit. The exception was one participant, who stated that she knew the limit, although her response was incorrect.

Yes, I know it's half a teaspoon. It's one of those things I heard someone say, I can't really remember. - **B11**

Salt reduction awareness

Five participants reported that they had heard about salt reduction prior to the semi-structured interview. They identified clinics, television, and a dietician as their sources of information.

"I heard previously from a dietician."- **C2**

"I heard from the clinic."- **C5**

"I was told by the nurses at the clinic."- **B12**

I saw it on the TV [television]. - **B8**

Knowledge on the relationship between salt and sodium

The researcher wanted to find out if participants knew the difference between the terms 'salt' and 'sodium'. Eighteen participants stated that they did not know the difference.

Difference between salt and sodium? <Laughs> No I don't. - **Bc1**

One participant stated that they knew the difference, but upon further questioning they were unable to correctly identify the difference. Although their response was incorrect, it showed that they had some knowledge on the relationship between salt and sodium.

"I think sodium contains salt."- **C2**

3.10.2 Knowledge related to reading food labels and purchasing food

Reading food labels and household responsibility

The researcher wanted to determine who was responsible for purchasing groceries in each participant's household. Sixteen participants were in charge of purchasing groceries for their homes. This study also explored the participants' food label reading practices. Only four revealed that they read food labels when shopping; however, none of them specifically looked at salt content. They mainly focused on the nutritional value and expiry date of the products they purchased.

Yes but mostly no, but afterwards [sometimes I will read food labels] when something triggers me. I usually just check the expiry date. - **C2**

"I read the expiry date." - **B9**

Yes, I look for allergies [allergens]. - **C4**

"I read the expiry date and to check the minerals and vitamins, to see how much it has. I don't understand all the information but I just check." - **B14**

The expiry date? - Oh how much is in the tin? Oh, I don't read. - **B10**

3.10.3 Salt and health

Perceptions on a high salt diet and knowledge of health risks associated with a high salt intake

The researcher wanted to find out the participants' perceptions of a high salt diet on health. All but one expressed that consuming excessive amounts of salt is hazardous to one's health. The remaining participant stated that it was beneficial for the body. Participants were also asked if they knew of any health related consequences related to a diet high in salt.

"Eating a lot of salt is a good thing, it nourishes the body." - **B15**

No [it's not good for your health], it causes disease[s] such hypertension and heart conditions. - **C2**

When you eat a lot of salt it can get mixed up with your blood pressures [raises my blood pressure]. - **C3**

No it's not right; it makes my [blood] pressure go up. - **B12**

No it [salt] it causes asthma. - **B11**

No, it [salt] makes you sick, it makes you have [an] asthma [attack]. It also makes you cough."- **B14**

It's [salt] not okay for your health. It causes me to have asthma. If you eat a lot of salt you get asthma and sweat at night. - **B9**

"Yes, like high blood pressure and sugar diabetes." - **B13**

No. Because when I eat a lot of salt my pressure goes up. My sister has a heart [condition]. I told her not to eat salt and she has diabetes too. - **C6**

It's not good, it's dangerous. There is something that it does when you eat a lot. I just can't remember. – **Cc1**

3.10.4 Salt related practices in food practices

Salt added during food preparation and use of spices and herbs

The researcher wanted to find out if participants added salt during meal preparation and, if they did, how it was measured. All participants added salt during meal preparation. One further stated that when cooking with beef stock cubes, she did not find it necessary to add any salt due to the saltiness of the cubes. Eleven participants used teaspoons to measure out salt when cooking, while the remaining 8 used their hands. Seventeen participants also used

other spices when cooking, and only 9 used herbs. One participant that did not use herbs in meal preparation stated that her decision was determined by their cost.

Yes, [I add] a little bit. But sometimes when I take [use] a beef stock I don't add salt. - **B1**

I use a teaspoon. - **Cc1**

Yes, when I need it. A pinch with my fingertips. - **C2**

I don't use herbs because they are so expensive. I can't afford it!- **B11**

Participants were asked if they added discretionary salt to their food before eating, and 68% admitted to doing so frequently. Those that did not add salt during meals stated that this was because of personal preference, as well as due to a fear of the health risks associated with high salt consumption.

No [I don't add]. Yooo, I don't like salt. - **B9**

"I like salt; I add salt all the time, so I would say always." - **C3**

No [I don't add], I'm afraid of the [blood] pressure. - **C6**

3.10.5 Cultural and religious uses of salt

The researcher wanted to determine if participants had any knowledge of cultural or religious uses of salt which may necessitate high salt intake.

Some throw it in front of doors to keep the dirt [bad spirits] away. Some put it under their pillow for the Tokoloshe [a water spirit in Zulu mythology]. Some throw it in water when their feet is [are] sore then it takes out the sore [takes away the pain]. - **C3**

You boil water and you add salt and drink it and then you vomit to remove the phlegm, then you feel relief in your chest. I got this [information] from my mother. Salt brings you God's spirit by chasing away bad spirits from your body. Sometimes I also put it in my water and bath with it. - **B15**

In traditional ceremonies we use salt to dry the cow skin. - **B14**

Others add to meat when we have our ceremonies, otherwise it won't be okay [it will rot] (Added to raw meat as a preservative) - **B12**

3.10.6 Reasons for salt reduction

One participant explained that she had already reduced the salt in her family's diet for fear of her husband's health.

"I reduced for health reasons. My husband is big. I reduced the salt because I'm afraid of hypertension and heart disease. He isn't big, in fact he is huge but when he went to the doctor [he] had himself tested for cholesterol, BP and there was zilch [nothing]." **- C2**

"I really need to reduce because of my pressure. I would say just add a little bit just to taste." **- B12**

CHAPTER 3C: PHASE 1 DISCUSSION

3.11 Introduction

This discussion section looks at the knowledge and practices of people with regards to dietary salt reduction. This chapter will exam how the results presented in Chapter 3B compare to or differ from previous studies conducted.

3.12 Dietary salt reduction: Global interventions

Due to the increased burden of NCDs globally, dietary salt reduction has been identified as a cost-effective non-pharmacological intervention. The WHO states that a reduction of dietary salt intake to less than 5g per day could decrease the risk factors associated with the development of NCDs such as cardiovascular diseases (WHO, 2016b). The three main strategies that have been prioritised to achieve population-wide dietary salt reduction amongst WHO member states include: reformulation of processed foods, consumer awareness and education, and environmental changes (WHO, 2013c). Globally, various countries have successfully implemented a combination of these strategies. In developed countries where processed foods are the main contributor of salt within the diet, food reformulation has been adopted. In countries such as Finland (Karppanen & Mervaala, 2006) and the United Kingdom, food reformulation has been implemented by food manufacturers on a voluntary basis (FSA, 2009; He & MacGregor, 2008; Wyness, Butriss, & Stanner, 2012). In countries with high discretionary salt use, particularly in Low-Middle Income Countries (LMIC), consumer education awareness and education is fundamental. An individual's knowledge, attitudes, and practices are modifiable factors that are said to influence salt intake (Sarmugam, Worsley, & Wang, 2013) and may be changed through consumer awareness and educational campaigns (Land et al., 2014).

In the case of South Africa, a developing country, where processed food accounts for 54% and discretionary use accounts for between 33% and 40% of salt in the diet, a combination of the aforementioned strategies would be beneficial (Charlton et al., 2005) . Regulations relating to the reduction of sodium in certain foodstuffs and related matters were published under the Foodstuffs, Cosmetics and Disinfectant Act (54/1972) of 20 March 2013 (Department of Health, 2013). As a result, South Africa became the first country in the world to implement mandatory salt reduction by the food manufacturing sector. To address discretionary salt use within the population, various stakeholders were brought together to form Salt Watch, a group responsible for conducting nationwide salt reduction campaigns aimed at the South African population (Eksteen & Mungal-Singh, 2015;Webster et al., 2017).

3.13 Rationale for choice of setting and target group

As stakeholders in a shared community, CBOs, academic researchers, and community members all play fundamental roles in community development and empowerment, and are able to build upon each other's strengths to gain insight into common issues of concern (Roche, 2008). Nineteen women (3 cooks and 16 guardians) were selected through purposive and convenience sampling to participate in the explorative needs assessment stage of this study. In previous studies on consumer awareness, women participants had been selected, as they are often responsible for purchasing and preparing food (BeLue, 2016), and are the gatekeepers of their households (FSA, 2009; Stuart & Achterberg, n.d.). Results from a consumer analysis conducted on the South African population highlighted that women were the most receptive target group, particularly those falling in the Living Standards Measure 3-7 (Eksteen & Mungal-Singh, 2015).Cooks in this study were selected due to their key role in the preparation of food at both centres, and because of their circle of influence in their individual communities. By equipping women with the knowledge and tools required for the reduction of dietary salt, it is hoped that these techniques will also be implemented in their own households (Alex McIntosh & Zey, 1989).

3.14 Observation phase

3.15 SSI to assess participants' knowledge and practices

Explorative SSIs were conducted to assess the target group's pre-intervention knowledge and practices levels. This step served as a needs assessment to identify KAP gaps to be addressed in the educational intervention and to be included in the developed HILs (Stuart & Achterberg, n.d.).

3.15.1 Perceptions on personal salt intake

This study found that only 21% of the participants considered their daily salt intake to be 'a lot'. In their study conducted amongst medical students in Angola, Magalhães et al. (2015) found that only 3.3% of the participants felt that they consumed 'too much' of salt, with another 3.3% stating they thought they consumed 'far too much'. Within the same study, the participants' salt intake was calculated to be 14.2 +/- 5.1 g/day. According to Charlton et al. (2014), the South African population is categorised as having a high salt consumption, with the daily intake ranging between 7.8 g and 9.5 g. The greater proportion of participants in our study viewing their intake as either adequate or 'too little' highlights that the disparity between perceived salt intake and the actual quantities consumed is caused by the participants' inability to discern their excessive salt intake (Cornélio et al., 2012). The

misconception of their personal salt intake potentially influences their decision to change their salt-related behaviours (Claro et al., 2012).

3.15.2 Knowledge of daily recommended salt intake

Two types of knowledge are needed for people to effectively address issues such as dietary salt reduction: declarative and procedural (Sarmugam & Worsley, 2014). Declarative knowledge refers to an awareness of the facts of the situation, whereas procedural knowledge refers to the know-how needed to perform practical tasks (Kemm, 1991). In terms of declarative knowledge, it is important that the public be made aware of daily salt recommendations, given that discretionary salt is one of the highest contributors of salt to the South African diet (Charlton et al., 2014). Results from this study showed that participants were unaware of the WHO recommendations of 'no more than 5g of salt per day' (WHO, 2013c). As a result, it is fair to assume that members of the general public are neither in a position to control their discretionary intake nor are they able to restrict their daily consumption to recommended limits. The lack of declarative knowledge furthermore influences the participants' perception of their own salt intake (Crawford, 2005; Sarmugam & Worsley, 2014), which influences their decision to change their salt-related behaviour (Claro et al., 2012).

3.15.3 Knowledge on the relationship between salt and sodium and food label reading practices

A second deficiency in declarative knowledge noted in this study was the participants' lack of knowledge about the relationship between salt and sodium. None of the participants were able to identify the link, and this was consistent with other studies. Knowledge of this relationship affects food label reading behaviours, as salt is commonly referred to as sodium (Grimes, Riddell, & Nowson, 2009). Misinterpretation of these nutritional values potentially affects their selection of foods with lower salt content (Miller & Cassady, 2015). Label reading plays an important role in influencing consumers' decisions on which foods they purchase. Only four participants stated that they read food labels whilst shopping, and this was consistent with findings by Land et al. (2014), where 70% of their respondents did not check food labels. Those reading food labels were not concerned with salt content but tended to concentrate on allergens and expiry dates. Having the majority of the participants not reading food labels highlighted the level of participants' procedural knowledge. According to Worsley (2002), procedural knowledge positively affects food label reading behaviour.

13.15.4 Salt and health

In this current study, the majority of participants (95%) perceived a high salt diet as being detrimental to health, with the exception of one participant. The most commonly identified condition caused by high salt intake was hypertension, and this finding was reflective of other studies (AWASH, 2007; CASH, 2016b).

13.15.5 Salt related practices in food practices

In terms of discretionary salt use, an international study found that 21% of South African participants admitted to adding salt during meal preparation (Newson et al., 2013). In our study the figure was far higher, with 68% of participants admitting to this behaviour. Our results were similar to those reported by Marakis, Tsigarida, Mila, and Panagiotakos (2014) in their study investigating the knowledge, attitudes, and behaviours of Greek adults towards salt consumption, where 72.4% of participants added salt when cooking. The American Heart Association recommends the use of spices and herbs during meal preparation to reduce salt intake (AHA, 2014) . The use of spices and herbs is encouraged to add flavour to food and to deter people's reliance on salt to enhance flavour (Salt Watch, 2014). In this present study, 89% of participants reported that they used spices during meal preparation, with 47% also using herbs. An Australian study conducted in Lithgow contrasted with our findings, reporting that the majority of their participants did not use spices when cooking (Land et al., 2014).

13.15.6 Cultural and Religious uses of salt

This study also revealed religious and cultural overtures affecting the use of salt, as it is viewed as being able to ward off bad luck and to fend off tokoloshes (Marashe & Maposa, 2010). It was reported that salt would be sprinkled around houses, on roof tops, and under pillows to protect the inhabitants from evil spirits. One participant revealed that, culturally and religiously, a mixture of salt and warm water was used to induce vomiting. This process was seen as ridding the person of illness and has also been reported by Semenya & Letsosa, (2013). According to Eksteen and Mungal-Singh (2015), cultural and spiritual uses of salt contribute to South African's high salt intakes, and the popularity of such practices make them cause for concern.

13.16.6 Exposure to salt reduction messages

Findings of this study revealed that some participants had previously been exposed to salt reduction information. Sources of this information ranged from health care professionals

working at primary health care facilities and a dietician, highlighting the crucial role health care professionals could play in the reduction of dietary salt (Crawford, 2005; Probst-Hensch et al., 2011). Television programming was also identified as a source of information, and, given the past success of the Food Standard Agency's media campaign in the United Kingdom, it is apparent that the mass media should be considered when raising awareness on issues of public health (FSA, 2009). Salt Watch South Africa was launched in response to the significant contribution of discretionary salt to the South African diet, with the aim of educating the population about practical dietary approaches to the reduction of salt consumption. Between 2014 and 2015, Salt Watch ran a series of nationwide television and radio consumer awareness campaigns (Heart and Stroke Foundation South Africa, 2014b; Webster et al., 2017).

3.16.7 Other findings

One participant in this study had already made the decision to reduce the salt in her family's diet. She stated that this change was prompted by her concerns for her husband's health. A study conducted by Kenten, Boulay, and Rowe (2013) revealed that at times for habitual changes to be made, a radical situation may be necessary to catalyse this change.

CHAPTER 4: EDUCATIONAL INTERVENTION

4.1 Introduction

This chapter looks at the educational intervention of this study. This phase consisted of two components: the participatory development of the HILs and the educational interactive sessions that were conducted concurrently. This chapter details the methodology used, results obtained, and the discussion thereof.

CHAPTER 4A:PHASE 2 METHODOLOGY

4.2 Theoretical models

4.2.1 The Comprehensive Health Education Model

- see section 3.2.1

4.2.2 The Social Cognitive Theory

The Social cognitive theory (SCT) acknowledges the important, dynamic, and mutual relationship between behavioural, personal, and environmental influences on behaviour, and provides a means of converting knowledge of these factors into effective approaches for promoting changes in behaviour (Bandura, 2004; Glanz, Rimer, & Viswanath, 1997). The SCT posits that behaviour is learned through the constructs of observation and reinforcement (Bandura, 1998). It is of great relevance to health education and health promotion programmes (Macdonald, 2000), as it explains habitual behaviour patterns and shows how people can be influenced to change. The SCT has been successfully applied to interventions aimed at promoting habits such as increased physical activity (Bandura, 1998; Hawley, Harker, & Harker, 2010), condom use, and dietary behaviours (Chlebowski et al., 2006; J. H. Young et al., 2005). The table below details how the SCT was applied to the educational intervention:

Table 13: Application of SCT constructs to this study

Social Cognitive Theory Construct	Application in Intervention Phase
Reciprocal determinism refers to the dynamic interaction between behaviour, person and environment in which the behaviour is performed.	Interactive educational sessions included information on how to provide a low salt environment in their homes. This can be done through purchasing low salt foods and removing salt shakers from the table during mealtimes. By creating an environment conducive to salt reduction, salt related behaviours may be influenced to change.
Behavioural Capability refers to an individual's ability to carry out behaviour through gaining necessary knowledge and abilities. Knowledge of 'what to do' and 'how to do it' is essential for a person to behave successfully.	The educational intervention provided participants with information on how to reduce their dietary salt intake and to read and interpret food labels. With this knowledge, if willing, participants have the potential to reduce the salt in their diet.
Observational Learning maintains that people can observe behaviour performed by others, and then mirror it. By observing a successful demonstration of desired behaviours, people can successfully mimic tasks.	Interactive educational sessions included demonstrations on how to measure salt with a teaspoon when cooking, how to rinse off tinned foods before use, highlighted the need to replace excess salt with spices of their choice, and showed how to start a small herb garden within the constraints of a lack of space and resources.
Reinforcements refer to the internal or external, positive or negative responses to a person's behaviour, and influence the probability of their continuing or discontinuing the behaviour.	During the intervention, the consequences of continued excessive salt use were explained, and salt reduction was encouraged. Positive reinforcement has the potential to increase the chances of participants deciding to reduce their personal salt intake.
Self-efficacy this refers to one's ability to take action and overcome obstacles. Self-efficacy can be achieved by taking small steps to achieve behaviour change.	Participants were encouraged to tackle salt reduction in small manageable steps by gradually changing their salt related behaviours.
Expectations are the anticipated consequences of a person's behaviour, and are usually determined by past experiences. Expected outcomes greatly influence whether the behaviour will be completed successfully. The emphasis placed on the health outcome of certain behaviour also influences the expected outcome (Bandura, 2004).	Positive consequences of reducing salt and reading food labels were emphasized during interactive sessions. This may motivate participants to reduce their dietary salt intake.

4.3 Research design

4.3.1 Academic researchers

–see section 3.3.1

4.3.2 Qualitative research method

- see section 3.3.2

4.3.3 Rationale for research approach

- see section 3.3.3

4.3.4 Research setting

- see section 3.3.4

The pilot testing of research instruments used in this phase of the study was conducted at Rhodes University. Part of the HIL development process involving Rhodes University peer educators took place at Rhodes University in Grahamstown.

4.3.5 The community-based organisations

-see section 3.3.5

4.3.6 Study participants

-see section 3.3.6

Participants involved in the participatory development of the health information leaflets were from St Mary's DCC, the Assumption Sisters' Nutrition Centre and the Rhodes University peer educators[4]. Due to limited input from the CBO participants, Rhodes University peer educators were included as participants in the developmental phase of the study.

In qualitative research, it is possible to supplement a study sample by introducing additional participants or including a second sample within the same scope of a study. This can be done in instances where it is seen that sound qualitative data cannot be collected, thus affecting the study (Ritchie et al., 2013).

Participant remuneration

Shopping vouchers valued at R50 each were given to Phase 1 participants as compensation for their time dedicated to the study. The provision of shopping vouchers over money is recommended to avoid having the incentive being spent on products or behaviours that may

[4] The Rhodes University peer educators are a group of support staff volunteers previously actively involved in HIV/AIDS awareness. Currently the group is a key role player in 3 health promotion studies being conducted by the Faculty of Pharmacy.

ultimately cause harm to the participants (Ritchie et al., 2013). To acknowledge receipt of the voucher, participants were required to sign the participant remuneration form. However, it was possible to continue the study with the Rhodes University peer educators without remuneration.

4.3.6.1 Key role players

Several key role players were involved in the HIL development process. These individuals and the roles they played are detailed below:

Peer reviewers

The peer reviewers involved in the HIL development process were Rhodes University Master of Pharmacy candidates also involved in health promotion research. They were involved in the evaluation of HILs using the SAM and PEMAT tools and provided valued formative feedback.

Other health professionals

A medical doctor, dietician and two registered nurses were involved in assessing the content validity of the HILs. They also provided written formative feedback on the developed HILs.

African languages and cultural expert

An African languages and cultural expert who was also a local Grahamstown resident was involved in the study to provide inputs on the cultural appropriateness and context specific elements of the HILs.

Rhodes University student wellness manager

The student wellness manger from Rhodes University was involved to provide formative feedback.

4.3.7 Study sampling

– *see section 3.3.7*

4.3.8 Ethical considerations

The following ethical considerations were made during this study:

4.3.8.1 Ethical Approval

Prior to the commencement of this study, a research proposal for the educational intervention was submitted to and defended in front of the Higher Degrees Committee, Faculty of Pharmacy, Rhodes University. The matter of participant remuneration was included in the Phase 2 research proposal. Ethical approval was obtained from the Faculty of Pharmacy Ethics Committee at Rhodes University (Appendix F).

Due to the limited inputs from the main participants as the study progressed, ethical approval was sought from the Faculty of Pharmacy Ethics Committee at Rhodes University to include Rhodes University peer educators as participants (Appendix I).

4.3.8.2 Non-maleficence

–see section 3.3.8.2

4.3.8.3 Confidentiality

-see section 3.3.8.3

4.3.8.4 Informed consent

- see section 3.3.8.4

4.3.9 Data collection methods

Data collection techniques and tools used in the educational intervention phase are summarised in the table below:

Table 14: Phase 2 data collection techniques

Data collection technique	Research tool used
Introductory / debriefing meeting	Note taking
Educational interactive sessions	Note taking Audio recording
Post-intervention semi-structured Interviews	Audio recording Semi-structured interview guide Note taking

4.4 Research procedures

The research procedures undertaken during the educational intervention are detailed below:

4.4.1 Introductory/debriefing meeting

A meeting where the needs assessment findings were shared with the stakeholders from the CBOs and participants was conducted at each centre. This meeting also served as an introductory meeting where the objectives of the educational intervention were discussed. Participants were also shown the phase 2 participant invitation letter (Appendix G). Written informed consent to take part in this phase of the study was obtained from the participants (Appendix H).

4.4.2 HIL development procedures

During the HIL development process, a total of six steps were undertaken and they are detailed below:

4.4.2.1 Step 1: Conceptualisation of HILs

Based on the knowledge and practices gaps identified from the needs assessment phase of this study and existing salt reduction materials, three primary topics were identified for the HILs. These topics were: *Salt and my Health*, *Reducing salt in my diet* and *Reading food labels*. A literature review was conducted on these topics, and existing pamphlets and factsheets were used to guide the development of the first HIL drafts. These reference sources were also consulted throughout the development of all of the subsequent HIL drafts. A tri-fold, A4, six panel template was selected on Microsoft Publisher® as the design for the HILs.

The following literature-based recommendations were adhered to during the conceptualisation of the HILs:

- **Content:** Information included in written health materials should be concise to make it understandable. Each material should preferably focus on one main topic or idea to enhance its effectiveness (Turnbull, 2003; Yaghmale, 2003).

- **Language and style:** Simplified language should be used, including vocabulary familiar to the intended audience, as it makes the information better suited for them. Effort should be made to avoid the use of complex terms and medical jargon (Lake et al., 2007). In instances where this is unavoidable, definitions should be provided (Kitching, 1990). Grammar and spelling must be checked.

- **Font size and type:** The chosen font size should be easy to read. It is recommended to use different font sizes to make important information prominent. When this is applied to headings, it makes navigation through material easier. Stylised fonts, the use of italics and capital letters is not encouraged, as they make text difficult to read (Renuka & Pushpanjali, 2013).

- **Design and layout:** applying column formats to the written text helps readers navigate the information. A landscape orientation is preferred, as it may be helpful to the reader. Layout elements must be maintained throughout the HIL for consistency and uniformity. Adequate white space makes the material easier to read and aesthetically appealing without overwhelming readers. Justified text should not be used. To avoid long sentences, the use of bullet points is encouraged (Center for Disease Control and Prevention, 2009).

- **Print colour:** Dark text is more prominent when set against a light background. Colours can be used to highlight important text such as warnings (Whittingham et al., 2008).

- **Graphics:** Images and photographs used in written materials should complement and be related to the written text. Graphics should be captioned; however, no new ideas should be introduced in these captions (Tutty & O'Connor, 1999).

Content in draft 1 HILs

The content included in the draft 1 HILs is detailed below:

'Salt and my health' HIL

The main impetus of this HIL was to provide information on the health related consequences of a diet high in salt. The first information presented in the leaflet explained the relationship between salt and sodium. Common uses and sources of salt were also stated. The maximum daily salt intake recommendation for adults was included. Other conditions related to diets high in salt were also included in the HIL. As hypertension is the most common health related consequence of high dietary salt consumption, information explaining the condition was added. It was emphasized that uncontrolled hypertension could result in strokes or heart attacks. The HIL also contained an explanation of how salt raises blood pressure. Other causes of hypertension, such as familial history, stress, unhealthy diets, and inadequate physical activity, were also included, and were followed by recommendations on how to prevent the development of hypertension and how to keep it controlled.

'Reducing salt in my diet' HIL

This HIL was developed to provide participants with contextually specific information on how to reduce salt in their diets. The main sources salt in the South African diet, processed food and discretionary salt use, were explained. A list of foodstuffs that have been identified as the main contributors of salt in the South African diet was added. Tips on how to gradually reduce salt in the diet were included. The tips were centred on foods that were commonly consumed and accessible to the target audience, making the information more applicable to them. A simple, economical recipe on how to prepare stock was included. This was done to encourage readers to prepare low salt alternatives to high salt containing processed products, such as commercial stock cubes frequently used by members of the intended target group. As

use of herbs and spices are some of the suggested ways to reduce salt in the diet, information on how to start an herb garden was included.

'Reading food levels' HILs

The importance of reading food labels and the reasons why salt is added to processed foods were highlighted in the HIL. The alternative names for salt commonly found on food labels were included. Step by step instructions on how to read food labels were explained. Food labels showing salt quantities classified as low, medium and high were added. As this HIL is intended to be carried by the reader during their shopping trips, the information was highlighted to assist them in making healthier food choices. Tips to remember the daily salt intake and hidden salt in processed food were included.

The table below is a summary of the headings included in the respective draft 1 HILs.

Table 15: Headings in the HILs

Title of HIL	**Headings**
Salt and my health	• What is salt and what are its risks? • Where does salt come from? • What does salt do to my health? • Salt and high blood pressure • Activity - Crossword
Reducing salt in my diet	• Where does the salt in my diet come from? • Which foods are high in salt? • How can I reduce salt in my diet? • Did you know you can grow your own herbs? • Activity-Word search
Reading food labels	• Why read food labels? • What is sodium? • How do I read food labels? • Activity-Phrase matching

4.4.2.2 Step 2: Evaluation of draft 1 HILs

Online readability testing

To ensure accuracy of the readability results, multiple websites were used to determine the readability of the HILs. Six readability sites on the worldwide web were identified by the supervisor and researcher:

1. Online utility.org: http://www.online-utility.org/english/readability_test_and_improve.jsp
2. Joes web tool: http://www.joeswebtools.com/text/readability-tests/
3. Just web content: http://www.justwebcontent.com/readability-analyser/
4. Check text org: http://www.checktext.org/
5. Readability test tool: http://www.webpagefx.com/tools/read-able/check.php
6. Readability analyser: http://sarahktyler.com/code/readability.php

Each of these websites computed results for the FKGL and the SMOG. Initially, sample text from draft 1 of 'Salt and My Health' HIL was prepared for readability testing, excluding the acknowledgements. This was done by removing bullet points and punctuation such as exclamation marks, which influence the readability of a text. The entire sample text was uploaded to the various online readability sites. Results were tabulated (Figure 4), and two duplicate websites, 'Joes web tool' and 'Readability test tool' were identified. The researcher eliminated the 'Joes web tool' website.

Readability assessment of draft one of 'Salt and my health'		
	SMOG (grade level)	**FKGL (grade level)**
Website		
Online utility.org	6.11	4.77
Joes web tool	3.7	3.9
Just this web content	8	4
Checktext.org	5.6	2
Readability analyser	5.71	2.25
Readability test tool	3.7	3.9

*Duplicate readability websites

Figure 5: Determination of online readability websites to be used

Peer evaluation

First drafts of the HILs were assessed and evaluated by three peers in the Faculty of Pharmacy, using the SAM test (Appendix J) and the actionability component of the PEMAT (Appendix K). These peers were also Master of Pharmacy candidates involved in health promotion research in the Department of Pharmacy Practice. Prior to the assessment, a session explaining how to use the SAM and PEMAT was conducted. Changes recommended by peer reviewers formed part of those applied to draft 1 of each of the HILs, resulting in draft 2.

Self-scrutiny by researcher

While peer evaluations were taking place, the researcher concurrently scrutinised the first drafts of the HILs. Changes required were identified and formed part of those applied to draft 1 of each of the HILs, resulting in draft 2.

4.4.2.3 Step 3: Evaluation and content validation of draft 2 HIL by Healthcare Professionals

Draft 2 HILs were sent via email to a medical doctor and a dietician (from the Parirenyatwa Group of Hospitals, Zimbabwe) and delivered to two registered nurses (from the Rhodes University Health Care Centre) for formative assessment of the content. Changes recommended by the Healthcare Professionals (HPC) formed part of those made to draft 2 of each of the HILs, resulting in draft 3.

4.4.2.4 Step 4: Evaluation of draft 2 HILs by study participants and RU peer educators.

Focus group discussion for the formative evaluation of HILs

A total of 4 post-educational session audio recorded FGDs (detailed in *section 4.4.3.3*) were conducted over a period of 4 weeks at both CBOs. Participants were contacted telephonically or via SMS three days before the scheduled session. Participants were then given 15 minutes to read each HIL. Following this, they were asked questions adapted from a pre-tested question-guide (Appendix L). The researcher ensured that all participants were given equal opportunity to voice their opinions and ideas. Audio recordings and note taking were employed as methods of data collection. Recommended changes made by the participants formed part of those made to draft 2 of each of the HILs, resulting in draft 3.

FGDs with Rhodes University peer educators

The second set of FGDs was conducted in a similar manner with Rhodes University peer educators. A total of 4 FGDs were conducted over a period of 4 weeks. The first FGD served as a meet and greet, where the researcher introduced herself to the peer educators and shared the objectives of this phase of the study with them. Informed consent was obtained from all the participants (Appendix H). Recommended changes made by the peer educators during the FGD formed part of those made to draft 2 of each of the HILs, resulting in draft 3.

4.4.2.5 Step 5: Evaluation draft 3 HILs by African languages and cultural expert and RU student wellness manager

The third drafts of the HILs were evaluated by an African language and cultural expert and the RU student wellness manager. The drafts were also evaluated the student wellness manager at Rhodes University. The drafts were delivered to both evaluators prior to meeting with them for their feedback.

4.4.2.6 Step 6: Final editing

Draft 3 of the HILs under development were sent to the Rhodes University Graphic Design department for professional editing. The HILs were also sent to a professional language editor.

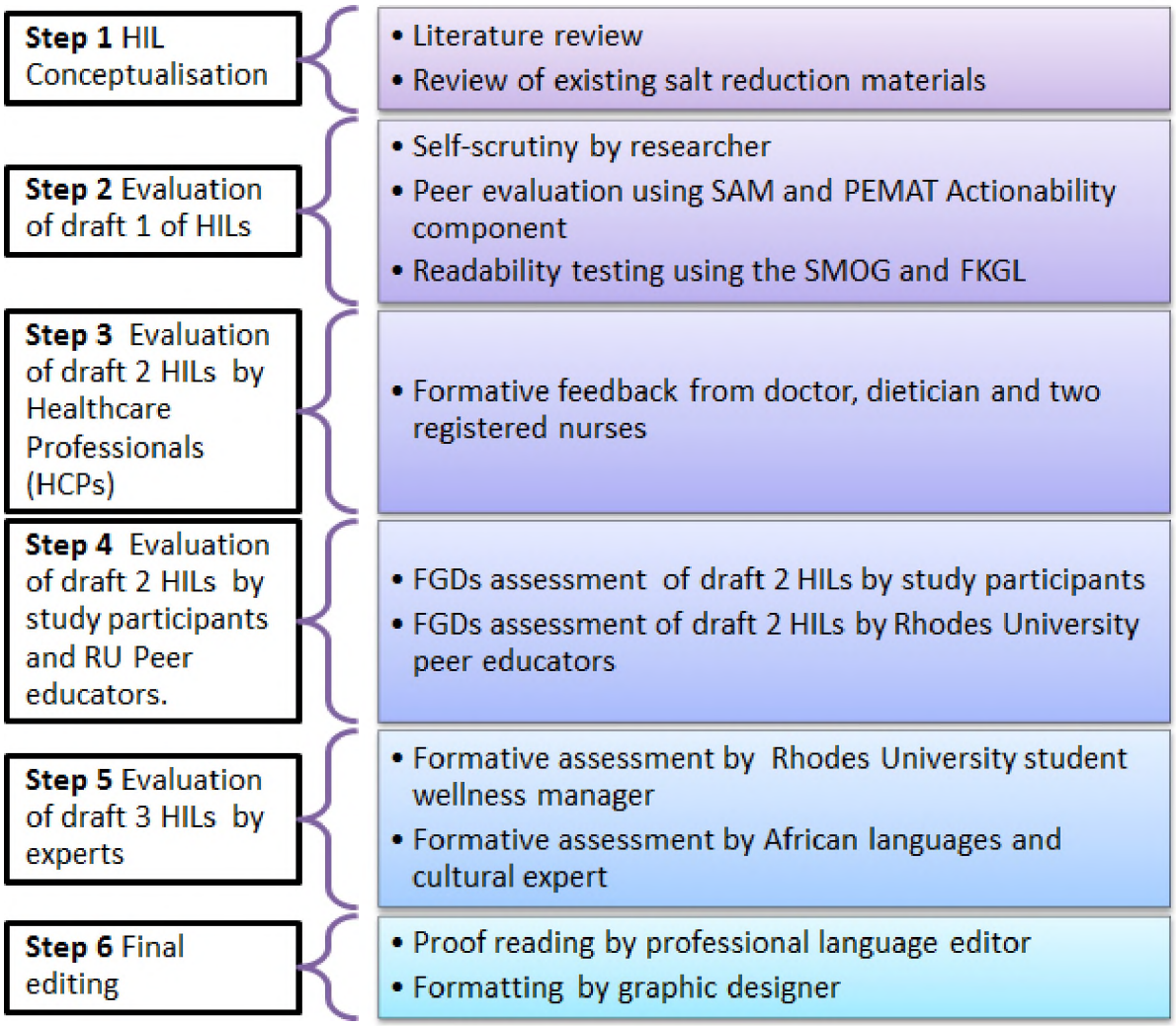


Figure 6: HIL Development process

4.4.3 Educational intervention

4.4.3.1 Piloting of FGD guide

The FGD question guide used to facilitate the FGDs detailed under *section 4.4.2.2* was developed (Appendix L). Due to the limited number of participants, pilot testing of the question guide was conducted with randomly selected, consenting Rhodes University support staff that were not peer educators to eliminate bias.

4.4.3.2 Interactive educational sessions

Three interactive educational sessions on the topics of 'Salt and your health', 'Reducing salt in your diet' and 'Reading food labels' and a final re-cap session were conducted at both centres (Appendix M). Constructs from SCT were used to draft the content to be addressed at each of the sessions. These interactive educational sessions were facilitated by a retired nurse

from the Grahamstown community. The facilitator being an IsiXhosa speaker also assumed the role of the interpreter. Prior to commencing the first session, the facilitator and participants introduced themselves to each other. This was done in an attempt to create an environment of mutual respect, co-operation, and collaboration. Participants were encouraged to actively participate, with the researcher inviting them to freely ask questions. An explanation of how each session would be run was provided, and the rules to be followed were established. The objectives of the session were detailed (Steinert, 1992).

The centres were chosen as the venues for the sessions as they were a setting familiar to participants, and were also in close proximity to the participants' homes (Halcomb, 2007). Participatory learning methods, such as visual demonstrations and participant reflections, were used. The researcher, facilitator, and participants were all seated in a circle to allow for maximum interaction and to reduce potential power disparities (eliminating power equations in focus group discussions). After each talk, participants had the opportunity to ask questions. Each participant was asked to share one point they found interesting or remembered from the talk. This was done to reinforce information shared during the interactive session.

4.4.3.3 Focus group discussions to assess HILs

Focus group discussions (FGDs) are a qualitative research method used in multi-method studies, in which a group of individuals has the opportunity to expand their knowledge, exchange opinions, and provide feedback on a certain topic (McLafferty, 2004). This method of data collection was established in the 1940s and was widely used in market research, and due to its effectiveness it was subsequently adopted in health education (Bloor, Thomas, & Robson, 2001). Formative research strategies, such as FGDs, play an integral role in the development and improvement of educational materials (Aileen McIntosh & Shaw, 2003) and allow the researcher to learn the target group's preferences on the information contained in the written materials as well as the appearance of these materials (Solomon et al., 2005).

The number of participants in the FGD affects the functioning of the group. It is recommended that FGDs involve 5 to 12 participants (Stewart & Shamdasani, 1990; Krueger, 1994). Increased group sizes often results in an increased number of non-involved participants. According to the literature, it is advised to conduct FGDs in a relaxing and comfortable environment (Kitzinger, 1995) .FGDs are useful instances where the researcher poses open-ended questions to gain the participants' personal insights in the area being explored (Kitzinger, 1995). Literature advises that the FGDs should be conducted in a relaxed

environment, with the aims of the discussion clearly explained to participants (Morgan, 1988).

In this study, FDGs to assess the developed HILs were conducted after each educational interactive session as detailed in *section 4.4.2.4*. Subsequently, FGDs were conducted in a similar manner with Rhodes University peer educators.

4.4.4 Educational intervention evaluation

In the fourth, recap session conducted at each centre feedback on the educational intervention was sought from the participants from the CBOs. Taking the majority of the participants' literacy into consideration and time limitations, feedback was obtained through FGD instead of questionnaires (Nutbeam & Bauman, 2006). Group discussions have been found to be an effective method in eliciting feedback particularly in groups with low literacy (Hawe, Degeling, & Hall, 1990).Due to positive response bias being strong in this method of data collection, participants were encouraged to freely express their opinions (Nutbeam & Bauman, 2006).

4.4.5 Post-intervention semi-structured interviews

-see section 3.4.6

Post-intervention SSIs were conducted with the phase 1 participants to assess changes in salt reduction knowledge. These changes in knowledge were assessed based two questions assessing declarative knowledge and one assessing procedural knowledge from the SSI question guide. These interviews were conducted at each centre. As an expression of gratitude, the participants were given R50 vouchers for their time dedicated to this phase of the study.

Results from the pre and post intervention statistically analysed using STATISTICA®.

4.4.6 Post-intervention observation of cooks

-see section 3.4.5

The researcher conducted post-intervention observation of the cooks as they prepared meals on three occasions.

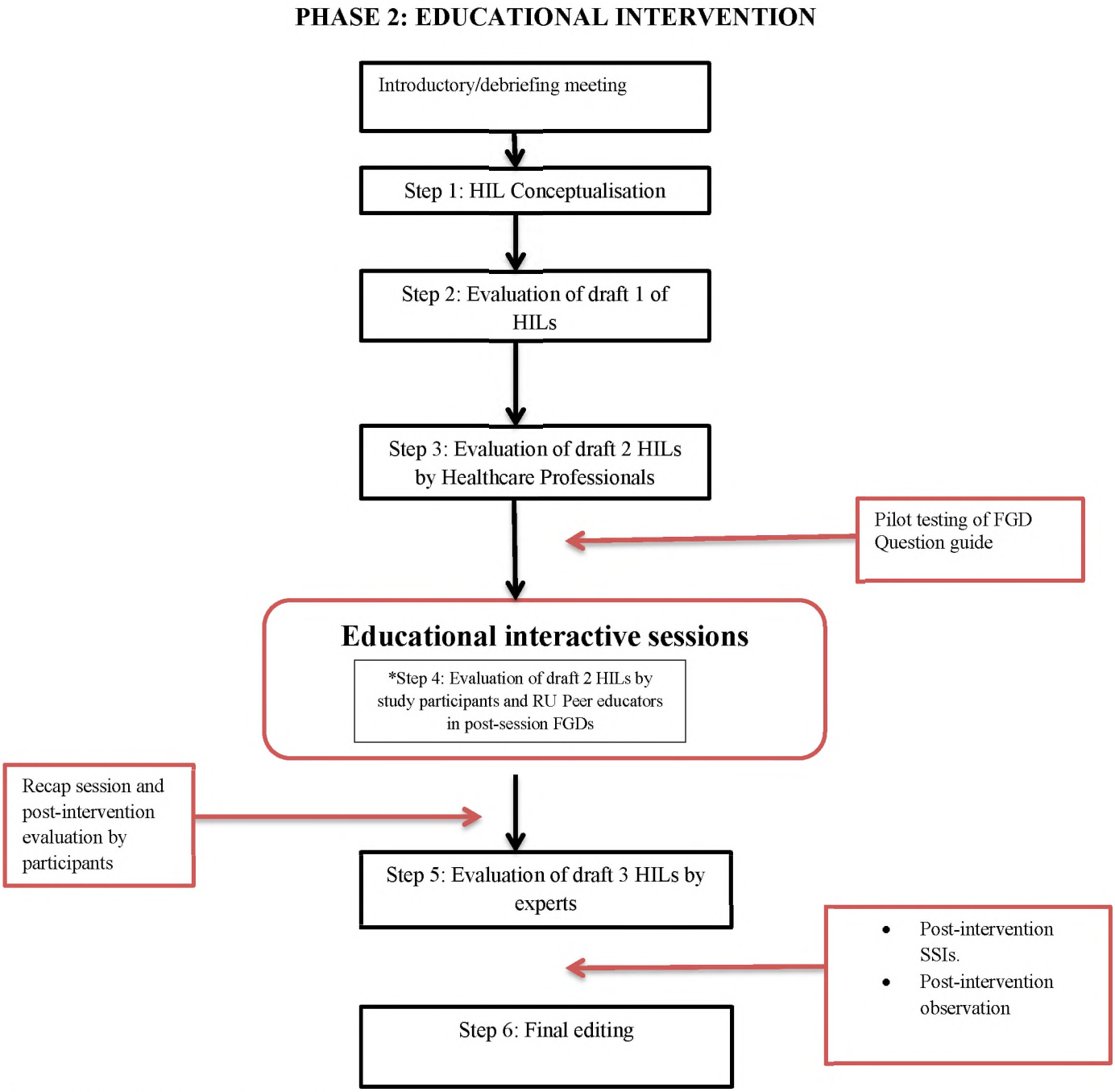


Figure 7: Phase 2 data collection process

4.5 Data management

-see section 3.5

(a) Organising and preparing data for analysis

The audio recorded, qualitative data obtained through the educational interactive sessions, FGDs and SSI, was transcribed verbatim, by the researcher. As a translator was used during the data collection sessions conducted in IsiXhosa, the researcher was able to transcribe them. The transcribed data was imported into and saved in NVIVO® 2010 software.

(b) Exploring data

- *see section 3.5*

(c) Analysis through data coding

- *see section 3.5*

(d) Thematic coding and description

- *see section 3.5*

(e) Interpretation of data

Data collected from this phase of the study was interpreted and was used to guide changes made to the HILs.

4.6 Validation of research methods

- *see section 3.6*

4.6.1 Member checking

Member checking is a strategy employed to maximise the trustworthiness and credibility of the data collected (Guba & Lincoln, 1989). In the overall study, this involved sharing the analysed data with the participants and key stakeholders in the study. This provides participants the opportunity to confirm or challenge the interpretations made by the researcher (Creswell & Plano Clark, 2011).

- Member checking was conducted at the introductory/briefing meetings attended by phase 1 participants and stakeholders from the CBOs. These meetings were held at each centre prior the commencement of Phase 2 of the study.

- In the educational intervention in Phase 2, member checking was conducted at the end of each FGD by recapping on the points raised concerning the HL. Modified HILs from the previous session were brought to the next meeting. This was to ascertain that the changes made to the HILs were in line with the recommendations made by the participants.

- Focus group discussions provided the researcher with feedback from the participants on the HILs, developed as part of the educational interventions. This allowed the researcher to develop context specific and culturally appropriate HILs.
- Interactive educational sessions provided the researcher with the opportunity to conduct the educational intervention, addressing and reinforcing gaps in the participants' knowledge.

4.6.2 Prolonged engagement with participants

- see section 3.6.2

In this phase of the study the researcher had regular content with the participants through the educational interactive sessions, FGDs and SSI.

4.6.3 Peer review

-see section 3.6.3

4.6.4 Triangulation

-see section 3.6.4

- In this phase of the study, the researcher employed multiple data collection methods: readability testing, the SAM and PEMAT instruments, interactive educational sessions, FGDs and SSIs.
- Quantitative results from the readability testing and the SAM and PEMAT were used to assess the quality of the HILs produced as well their suitability for the target audience. Qualitative data from the FGDs was used to develop culturally appropriate and context specific HILs. Quantitative data obtained from pre- and post-intervention scores obtained from the SSI showed the effect of the intervention on the participants' knowledge.

4.6.5 External reviewers

-see section 3.6.5

CHAPTER 4B: PHASE 2 RESULTS

4.7 Participant demographics

4.7.1 Study participant demographics

- see section 3.8

4.7.2 Peer educators demographics

15 Rhodes University peer educators were involved in the development of the three HILs. The group was made up of a total of 5 males and 10 females, all having been employed at Rhodes University for periods ranging from 2 to 35 years. Within the group, the lowest educational level was grade 9, with the highest being a tertiary diploma. The average age of participants was 45 years, and they were all second language English speakers, with IsiXhosa being their first language. Table 16 below provides a summary of the participants' demographics.

Table 16: Peer educators Demographics

Participant identifier	Gender	Age	Highest Educational Level Attained	Home Language
P1	Female	40	Tertiary Diploma	IsiXhosa
P2	Female	35	Grade 12	IsiXhosa
P3	Female	46	Grade 11	IsiXhosa
P4	Female	44	Grade 12	IsiXhosa
P5	Female	58	Grade 12	IsiXhosa
P6	Female	33	Tertiary Diploma	IsiXhosa
P7	Female	64	Grade 9	IsiXhosa
P8	Female	46	Grade 12	IsiXhosa
P9	Female	46	Grade 12	IsiXhosa
P10	Female	48	Grade 11	IsiXhosa
P11	Male	31	Grade 12	IsiXhosa
P12	Male	58	Grade 11	IsiXhosa
P13	Male	29	Grade 12	IsiXhosa
P14	Male	46	Grade 12	IsiXhosa
P15	Male	46	Tertiary Diploma	IsiXhosa

4.8 Step 2: Evaluation of Draft 1 HILs results

4.8.1 Readability testing results

Readability testing was conducted on the first and final drafts using the SMOG and FKGL. The results comparing the readability scores of the first and final drafts of all the HILs are presented in tables 17, 18 and 19 below.

'Salt and my health' HIL

Table 17:'Salt and my health' HIL Readability

	SMOG		FKGL	
Website	**DRAFT 1**	**FINAL**	**DRAFT 1**	**FINAL**
Online utility.org	6.11	7.05	4.77	4.82
Just this web content	8.00	8.00	4.00	4.25
Check text.org	5.60	5.90	2.00	1.60
Readability analyser	5.71	6.09	2.25	2.06
Readability test tool	3.70	4.00	3.90	3.60
Average grade level	5.824	6.208	3.384	3.266
Final grade level	6.00	6.00	3.00	3.00

'Reducing salt in my diet' HIL

Table 18: 'Reducing salt in my diet' HIL Readability

	SMOG		FKGL	
Website	**DRAFT 1**	**FINAL**	**DRAFT 1**	**FINAL**
Online utility.org	6.41	7.14	4.29	4.95
Just this web content	7.00	10.00	3.00	4.00
Check text.org	5.80	7.90	2.00	2.60
Readability analyser	5.41	7.52	1.88	3.00
Readability test tool	3.30	4.10	3.30	3.90
Average grade level	5.584	7.332	2.894	3.69
Final grade level	6.00	7.00	3.00	4.00

‘Reading food labels’ HIL

Table 19: ‘Reading food labels’ HIL Readability

	SMOG		FKGL	
Website	**DRAFT 1**	**FINAL**	**DRAFT 1**	**FINAL**
Online utility.org	6.77	8.15	4.96	5.31
Just this web content	10.00	10.00	5.00	4.80
Check text.org	7.70	7.90	2.40	2.60
Readability analyser	7.70	7.52	2.91	3.00
Readability test tool	6.60	6.30	5.30	5.50
Average grade level	7.754	7.974	4.114	4.242
Final grade level	8.00	8.00	4.00	4.00

4.8.2 Suitability Assessment of Materials results

The results for the SAM testing conducted by three peer reviewers in *section 4.4.2.2* on the three HILs are presented in the tables 20, 21 and 22 below. Then results from the draft 1 HILs are compared against those of the final HIL.

'Salt and my health' HIL

Table 20: 'Salt and my health' HIL SAM

	Draft 1 (%)	Final Draft (%)
Reviewer		
1	70	90
2	55	74
3	63	90
Average score	62.67	86.33
Final average score	63	86
Interpretation	**Adequate**	**Superior**

'Reducing salt in my diet' HIL

Table 21: 'Reducing salt in my diet' HIL SAM

	Draft 1 (%)	Final Draft (%)
Reviewer		
1	75	100
2	72	95
3	80	95
Average score	75.67	96.67
Final average score	76	97
Interpretation	**Superior**	**Superior**

'Reading salt foods' HIL

Table 22: 'Reading food labels' HIL SAM

	Draft 1 (%)	Final Draft (%)
Reviewer		
1	68	90
2	58	80
3	65	95
Average Score	63.67	88.33
Final average score	64	88
Interpretation	**Adequate**	**Superior**

4.8.3 The Patient Education Materials Assessment Tool Actionability results

The results from the *Actionability* component of the PEMAT conducted by the three peer reviewers in *section 4.4.2.2* are presented below in tables 21, 22 and 20. The *Actionability* assessment was conducted on the first and final drafts of the HIL.

'Salt and my health' HIL

Table 23: 'Salt and my health' HIL Actionability

	Draft 1 (%)	Final Draft (%)
Reviewer		
1	100.00	100.00
2	90.00	100.00
3	100.00	100.00
Average Score	**96.67**	**100**

'Reducing salt in my diet' HIL

Table 24: 'Reducing salt in my diet' HIL Actionability

	Draft 1 (%)	Final Draft (%)
Reviewer		
1	80.00	100.00
2	100.00	100.00
3	100.00	100.00
Average Score	**93.33**	**100.00**

'Reading food labels' HIL

Table 25: 'Reading food labels' HIL Actionability

	Draft 1 (%)	Final Draft (%)
Reviewer		
1	40.00	90.00
2	80.00	100.00
3	80.00	100.00
Average Score	**66.67**	**96.67**

4.8.3 Modifications made based on personal scrutiny and peer evaluation

Modifications made to the first HIL drafts after personal and formative peer scrutiny are presented in the tables 26, 27 and 28 below.

'Salt and my health' HIL

Table 26: Modifications made to draft 1 'Salt and my health' HIL

Modifications made	**Reason/ Quote from peers**
Information was separated into small chunks using bullet points **Highlighted key words** The words Sodium and Chloride were highlighted in bold	To improve the readability of the information. *"I think the words Sodium and Chloride should be highlighted to the readers' attention to them"* – **PR 1**

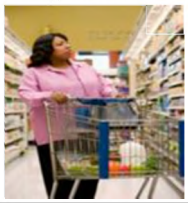
'Reducing salt in my diet HIL'

Table 27: Modifications made to draft 1 'Reducing salt in my diet' HIL

Modifications made	**Reason/ Quote from Peers**
Replaced  **With** 	*"The image of the chilli is too suggestive".*-**PR3**
Changed Add the ingredients to a pot and add 2-3 litres of water and boil for 3 hours**.** **To** Add the ingredients to a pot and add 1 litre of water and boil for 1 hour.	Changes were made to the recipe to accommodate the participants' resources.
Added Rosemary, thyme or parsley seeds or plants that flavour food.	This was added to allow participants to flavour their stock with herbs of their choices.

'Reading food labels' HIL

Table 28: Modifications made to draft 1 'Reading food labels' HIL

<table>
<tr><th>Modification made</th><th>Reason/Quote</th></tr>
<tr><td>Removed cover image
 
Replaced with
  </td><td>Changed the cover picture to include one portraying the action of reading food labels.</td></tr>
<tr><td>Removed
<table><tr><th colspan="3">NUTRITIONAL INFORMATION</th></tr><tr><td>Typical Values</td><td>Per 100g as packed</td><td>Per 20 g serving (approximately 3 crackers) (As packed)</td></tr><tr><td>Energy</td><td>2063 kJ</td><td>413 kJ</td></tr><tr><td>Protein</td><td>9.8 g</td><td>2.0 g</td></tr><tr><td>Total Fat</td><td>19.8</td><td>4.0 g</td></tr><tr><td>Total Sodium</td><td>581 mg</td><td>116 mg</td></tr></table>
Replaced with
  </td><td>Replaced images of food labels showing the different categories of salt content with tables presenting the foods found within these categories.</td></tr>
</table>

4.9 Step 3: Evaluation of draft 2 HILs by Healthcare professionals results

4.9.1 Feedback from dietician

The dietician stated that the HILs were well-written and attractive. She made a suggestion to caution readers about the use of pre-salted herbs and spices.

"The HILs are well written, creative and very informative."

"In the 'Reducing salt in my diet' HIL, you can add that people should avoid spices and herbs that are pre-salted and to watch out for foods containing hidden salt often labelled as MSG or Monosodium glutamate."

4.9.2 Feedback from medical doctor

The medical doctor reported that health related information contained in the HILs was medically sound. His general impression of the HILs was that they were attractive and they would draw the attention of the reader.

"The health related information provided in these pamphlets is accurate."

"The overall appearance of the pamphlets looks okay to me, very eye-catching."

4.9.3 Feedback from two registered nurses

One of the nurses stated that she enjoyed reading the HILs and that the information provided was accurate. The second nurse felt that the explanation on how salt raises blood pressure was a good point to include in the HIL. She relayed that often patients are just given instructions on lifestyle changes to make without any explanation on how this affects their bodies. She also raised concern over the ease of understanding of the 'Reading food labels'. She acknowledged that the skill interpreting food labels was essential in salt reduction.

"I enjoyed reading these pamphlets. The information and recommendations are accurate and I believe they will be easy for the people to follow and apply in their lives." - **N1**

"It is good that you have explained how salt affects blood pressure. Patients are just told to cut down on salt but not how it affects the body." - **N2**

"With the pamphlet on reading food labels I think people will need take some time and follow the instruction on how to read. The tables make it seem very difficult. If they master that, the skill will be very useful to them." - **N2**

4.10 Step 4: HIL evaluation of draft 2 by study participants and RU peer educators.

The question guide used to facilitate the FGD consisted of questions adapted from the SAM and PEMAT. The question guide included questions to assess content, literacy demand, graphics, layout and typography, learning stimulation, and cultural appropriateness.

4.10.1 'Salt and my health' HIL

Content:

Participants found the content in the HIL relevant, informative, and easy to understand. Some participants expressed that it provided them with new information they had never before come across and that they found this information interesting. One participant requested the inclusion of the fact that snacks contributed to the total salt consumed daily (*see Table 29*). The same participant requested that information addressing children's salt intake be included in the HIL (*see Table 29*).

To me [the information] is relevant .I like the definition and causes of high blood pressure and the salt daily intake for adults. Another thing I like is that you added the normal blood pressure [reading]. So to me I think that everything [information] you need is here. - **P1**

"I'm happy you included the normal BP because some people didn't know. I'm pleased with the causes." - **P5**

"I didn't know that it causes stomach cancer." - **P1**

Literacy demand:

Overall, participants found the language used in the HILs to be simple and easy to understand. One participant stated that they would like to have the terms 'Sodium' and 'Chloride' further explained.

"*I think it's simple English and everyone can understand."* - **P3**

"Where it says salt is made of sodium and chloride, for someone who doesn't understand those words, maybe it could be explained." - **P4**

Graphics:

Most participants stated that they found all graphics to be appropriate and clear. One participant expressed that she appreciated the captions, as they clarified the relevance of the pictures.

"The pictures make sense." - **P7**

The pictures are relevant, the whole pamphlet is simple, people can understand because the picture is explained [captioned]. - **P11**

Layout and typography:

"I like that each and every heading is being explained. First by explaining what does it mean and then you further give the causes. I like the way you have it." - **P5**

Learning stimulation

All participants agreed that the behaviour suggested in the HIL seemed easy to follow.

Activity:

I think it's a good idea [the activity]. After reading the pamphlet it gives you a challenge to see if you understood the information. - **P3**

"I like it, I wish that the crossword puzzle was more complicated. I like it, it engages people."- **P1**

Cultural appropriateness:

Participants did not find any aspects of the HIL to be culturally inappropriate.

4.10.2 'Reducing salt in my diet' HIL

Content:

Participants were pleased with the content of the HIL. They stated that it contained useful tips and that the information on salt reduction was contextually specific. Although the stock base recipe was well received, participants declared that they preferred ready-made stock cubes, as they were too lazy to prepare their own. Participants voiced that they liked the herb garden idea included in the HIL, particularly the use of recycled materials.

This is exactly what we wanted. When we open [the HIL] we see which foods are high in salt, we see our beef stock. I really like this pamphlet; I was even saying 'oh I can add lemon and vinegar to flavour food? I thought it was just for chips. - **P7**

It is useful [the stock recipe], but we are lazy to make our own stew. - **P4**

"This tip is the best, it is just that we are lazy and we like ready made things. It's just easier." **- P6**

I like this [herb garden], these are plastic bottles so we are also recycling. - **P4**

Literacy demand:

Participants stated that they found the language used in the HIL to be simple and no words required further explanation.

Graphics:

Participants appreciated the use of images in the HIL, with one participant requesting the inclusion of more pictures, especially for readers with poor reading skills (*see Table 30*). Another participant indicated the cover image was too similar to the one used in the 'Salt and my health' HIL, and suggested the use of either other high salt products or spices on the cover (*see Table 30*).

Layout and typography:

Participants were satisfied with the layout of the HIL.

Activity:

All the participants liked the activity included.

Cultural appropriateness:

Participants did not find any content in the HIL to be culturally inappropriate.

There is nothing offensive; it is an eye opener for everyone. - **P4**

4.10.3 Reading food labels

Content:

Participants deemed the HIL content to be sufficient and stated that the addition of more information would complicate it unnecessarily. The information was also found to be useful and relevant, helping participants learn how to interpret food labels.

The information is enough. If ever you put too much it won't be understood. - **P8**

I will take this with me when I go shopping because when I usually go I don't look for these things [food labels], I just buy. But now I have learnt. - **P15**

"I like these pamphlets, I would put it into my bag, I can see that this is helpful information. When I go shopping I will read." - **P3**

Literacy demand:

There was a suggestion to have the words 'sodium' and 'sodium glutamate' defined.

I want you to add the meaning of the words sodium, sodium glutamate-because someone may not know what it is. - **P8**

Graphics:

Participants stated that the cover image corresponded with the topic. There was a suggestion to include a picture of a can to indicate where the food labels are located.

Maybe put a picture of a can or something to show us where to find this table [nutritional information] - **P4**

Layout and typography:

The headings [steps] help me to understand. The size of the font is easy to read. - **P5**

Activity:

It [the activity] is very easy to use [complete]. If you read the pamphlet it helps you to understand it. - **P1**

Learning stimulation:

Participants reported that the behaviours demonstrated in the HIL were easy to follow.

Cultural appropriateness:

All participants found the HIL to be culturally appropriate.

I also don't see anything offensive in this one. **- C3**

4.10.4 Modifications made to HILs after feedback from participants

Modifications made to the second drafts of the HILs after obtaining feedback from the peer educators and NGO participants are presented in the tables 29, 30 and 31 below:

'Salt and my health' HIL

Table 29: Modifications made to draft 2 of 'Salt and my health' HIL

Modifications made	Reason/ Quotes
Replaced Cover picture  **Added** 	*"It would be better to have a picture of maybe a lady using salt. The pamphlet is about salt and health so we need to see a human".-* **P5**
Added sentence Between all the meals and snacks you eat in a day, an adult should only eat 5g. **Added sentence** Children should eat less than 5g of salt in day.	*"Well I think that you have mentioned that we use it on a daily basis in our lives. I think that you should include that when we eat our snacks we are also eating salt. Because people tend to forget that snacks contain a lot salt." -* ***P9*** *"It was striking that you mentioned that adults should eat less than 5g of salt a day and its concerning about the children, imagine how much it affects the children. They should get a small amount. Add how much children should eat".*-**P9**
Removed 'Fig' from all captions	*This [fig] makes me feel like I'm in school reading a textbook.* **-P3**

'Reducing salt in my diet' HIL

Table 30: Modifications made to draft 2 of 'Reducing salt in my diet' HIL

Modifications made	Reason/ quote
Replaced  **With** 	*This picture [cover image] looks like the other one ['Salt and my health' HIL]. We also have spices and that beef stock and soups that contains salt. I think we can leave that salt [picture] and maybe add a picture of beef stock and spices. I know that they say you must rather use spices than salt, but some people they go overboard with spices also.*- **C2**
Added images   	*I think we should add pictures of margarine and processed meat like boerewors or will it be too much? We can create space. Because truly speaking, when you open the pamphlets those three items immediately strike your mind [when you see the pictures]. We must remember that some of these people are not necessarily reading people, but if they look at a picture it will strike their mind.* –**P3**

'Reading food labels' HIL

Table 31: Modification made to draft 2 of 'Reading food labels' HIL

Modifications made	Reason/ quote
Image of can 	*Maybe put a picture of a can or something to show us where to find where this table [nutritional information]*- **P4**

4.11 Step 5: Evaluation of draft 3 HILs by African languages and cultural expert and RU student wellness manager

4.11.1 Feedback from African languages and cultural expert.

'Salt and my health' HIL

The cultural expert appreciated the use of the colloquial term 'high-high' when referring to hypertension and the inclusion of the picture of someone having their blood pressure taken, as these were things with which the target audience would be familiar.

"I see you have mentioned 'high-high!' I like that you have taken the time to find out how people refer to these diseases."

"I love that you have added the picture of someone getting their blood pressure measured. This is a procedure that everyone who has been to the clinic is familiar with."

'Reducing salt in my diet' HIL

The cultural expert also requested clarification on which tinned products required to be rinsed before use (*see Table 33*). He stated that the stock recipe was a good idea and that other people he had shown were also pleases with it. He found the idea of starting an herb garden to be a good suggestion.

The people I asked said they loved the recipe of making their own stock recipe.

Like the stimulating activity (herb growing activity). It is something the whole family can take part in. Not only does it provide them with their herbs, it also involves exercise [physical activity] which is much needed to stay healthy.

'Reading food labels' HIL

The African languages and cultural expert felt the step by step instructions made the HIL easy to follow.

4.11.2 Feedback from RU student wellness manager

'Salt and my health' HIL

The wellness manager advised that it would improve the HIL if the 5g mass of salt was compared to a teaspoon of salt. She stated that referring to the mass alone would potentially confuse people, as they do not necessarily weigh out all their ingredients when cooking (*see Table 32*). She was also pleased with the use of the term 'high-high', the colloquial term for hypertension.

"I like that you have used the term 'high-high' because it's something that people around here are familiar with."

'Reducing salt in the diet' HIL

The wellness manager was pleased with the HIL.

"I think everything is fine."

'Reading food labels' HIL

The student wellness manager expressed that the concepts addressed in this HIL were difficult to understand and that even individuals with high literacy would struggle with it. She stated that the section 'which foods should I pick' was well written and useful.

I think even highly educated people will struggle reading this.

"I like the section 'Which foods should I pick'. This summarises everything and I think it's very useful."

4.11.3 Modifications made to HIL based on feedback from African languages and cultural expert and RU student wellness manager

The modifications made to draft 3 of the HILs based on recommendations made by the African languages and cultural expert and the RU student wellness manager are presented below in tables 32, 33 and 34.

Table 32: Modifications made to draft 3 'Salt and my health' HIL

Modifications made	Reason/ Quote
Added caption to image 5g of salt is about a teaspoonful.	*You should simplify the "5g of salt". People don't usually measure their food so it would be better if you simplify and put it as "5g which is approximately 1 teaspoon" so they have something to compare it to.* - ***RU student wellness manager***

Table 33: Changes made to draft 3 'Reducing salt in my diet' HIL

Changes made	Reason/Quote
Added Rinse tinned foods such as peas in brine to remove extra salt.	*On the tip about rinsing tinned peas, add that you should only rinse vegetables in brine or salt water.* - ***African languages and cultural expert***

4.12 Step 6: Final editing of HILs results

Minor grammatical corrections were made by the language editor. Final graphic and spatial issues were addressed the graphic designer. Images of the final HILs are (Appendices N, O and P). Full scale versions of the HILs are attached at the end of the thesis.

4.13 Intervention evaluation feedback

Overall feedback on the intervention obtained from the participants revealed that the participants found the intervention have been informative and relevant, stating that they gained new knowledge on the topics covered. An IsiXhosa speaking participant stated that she enjoyed that the sessions were conducted in her home language. One participant stated that she felt the sessions were too long. Another participant appreciated that they were included in the participatory development of the HIL as it gave her the opportunity to have her voice heard. All participants were able to recall one learning point from the topics covered.

This project had a lot of useful information. I didn't know that small changes can help me make my family healthy. - **C7**

It was good to have this [educational sessions] in a language.-**B9**

Some days it felt like these meeting [sessions] took forever. –**C3**

I really liked it when I could tell you what I thought of the pamphlets and that we helped to make them. - **C4**

"Thank you very much for this project. We have learnt so many interesting things that we never knew. I feel like I can help other people in my family, my neighbours, everyone! It was good to learn that we can reduce the chances of getting high blood pressure by living healthy lives." –**B11**

4.14 Comparison between pre- and post-intervention salt knowledge

Overall, there was an increase in the number of participants whose salt reduction related knowledge had changed. Due to some participants moving away from Grahamstown or being unavailable for the post intervention SSIs, only 12 participants were interviewed. The table below compares the participants' pre- and post-educational intervention salt knowledge.

Table 34: Pre and post-intervention changes in salt reduction knowledge and behaviours

	Pre-intervention (n=19) **n (%)**	**Post-intervention (n=12)** **n (%)**
Aware of daily salt intake recommendations	0(0)	11 (92)
Correctly identified the relationship between and sodium	0(0)	2 (17)
Read food label correctly	0(0)	3 (25)

The results from the paired t-test conducted on the pre and post scores are in the table below:

Table 35: Paired student t-test results

T test for dependant samples Marked differences are significant at $p < 0.0500$ Null hypothesis ($H_0 : \mu_d = 0$) vs alternative hypothesis ($H_1 : \mu_d \neq 0$)		
	Variable	
	Variable 1 (before)	**Variable 2 (after)**
Mean	0	44.44
Standard deviation	0	25.9517
N		12
Diff of means		-44.44
Standard deviation diff		25.9517
T		-5.93
Df		11
P		0.04
Confidence -95.000%		-60.9322
Confidence +95.000%		-27.9544

At 11 degrees of freedom, a p - value of 0.04 was obtained. p – value < $\alpha = 0.05$, hence we reject H_0 and conclude that the intervention (interactive educational sessions) had an effect (since the mean difference is significantly different from zero and made a difference. the 5% (the 0.05 alpha level) level of significant.

4.15 Post-intervention observation of cooks

On the occasions where the cooks at both centres were observed no changes in behaviour were seen. Participants still measured salt using their hands during meal preparation and the foods bought had not changed.

CHAPTER 4C: PHASE 2 DISCUSSION

4.16 Rationale for use of HILs

Communication through various channels, is a fundamental part of health promotion (Rimal & Lapinski, 2009). In this current study, HILs were chosen as the medium to communicate written information related to dietary salt reduction to participants, as these tools are frequently used and are an integral part of effective health education (Paul et al., 2004; Renuka & Pushpanjali, 2013; Triad of Health Publishing, 2017). The provision of written educational information is considered to be necessary for engaging the public in health care (Currie, Rajendran, Spink, Carter, & Anderson, 2001) and is fundamental to health education programmes (Borland, Hocking, Godkin, Gibbs, & Hill, 1991; Hickner, Cousineau, & Messimer, 1990; MacKie & Hole, 1992).

Research has illustrated that written health information, such as health information leaflets, has the potential to change the knowledge, attitudes and behaviour of the reader, especially when used together with verbal instruction (Harvey & Plumridge, 1991; Paul & Redman, 1997). Some advantages of printed materials are that the readers can control the pace with which they read through and understand the information and they allow the reader to refer back to them when necessary (Shieh & Hosei, 2008).

Globally, various governments and organisations have developed written materials to raise awareness on dietary salt reduction as part of their salt reduction strategies (AHA, 2016; CASH, 2016a; WASH, 2008; WHO, 2016c). In South Africa, Salt Watch in collaboration with the Heart and Stroke Foundation carried out a mass media consumer awareness campaign that included the development of written materials (Eksteen & Mungal-Singh, 2015; Salt Watch & Heart and Stroke Foundation South Africa, 2015). Although awareness campaigns have been conducted and materials developed as part of the national salt reduction health promotion effort, there is also need for local community based campaigns that are tailored to target populations (National Department of Health, 2015). Webster et al., (2016) acknowledge that individual focused salt reduction strategies such as consumer education have the potential to unintentionally exacerbate health inequalities between the varying social classes. This highlights the need for culturally appropriate and context specific salt reduction programmes and materials tailored for individuals in low economic settings to address these disparities. In this study the goal was to address the above mentioned concerns by developing

a series of salt reduction health information leaflets specifically tailored for the target group identified.

4.17 Development of health information leaflets

Various authors and agencies have provided guidelines for the development of effective written health materials (Center for Disease Control and Prevention, 2009; Jewish General Hospital, 2008; MedlinePlus, 2015; Renuka & Pushpanjali, 2013; Tutty & O'Connor, 1999). The key elements focused on during the development process are detailed below:

4.17.1 Content

Kitching, (1990) has concluded that written health information is most effective when it is easy to understand, short and concise. Participants in the FGDs found the content in all the HIL to be informative, relevant and containing adequate amounts of information. This supports the fact the HILs were developed following literature guidelines (Center for Disease Control and Prevention, 2009). It was also found that the participants thought the information was relevant to their specific contexts thus increasing the chances of them applying the information to their lives.

4.17.2 Graphics, layout and design

In this study, pictures related to the written text were incorporated to improve the understandability of the text (Brotherstone, Miles, Robb, Atkin, & Wardle, 2006; Lowry, 1995; Whittingham, Ruiter, Castermans, Huiberts, & Kok, 2008). Pictures also improve the attractiveness of the written material, which, according to the Information Processing Theory, is necessary for it to catch the readers' attention, and to increase its chances of being read (Flay et al., 1980). According to Houts, Doak, Doak, & Loscalzo, (2006) the use of appropriate pictures in health information materials increases readers' ability to remember the information. According to Choi and Bakken (2010), the use of captioned pictures improves the efficacy of visual aids and based on this captioned pictures were used in this current study. Overall participants found all the pictures used in this study to be appropriate.

Following peripheral strategies proposed by Petty & Cacioppo, (1996) and Bechtel & Davidhizar, (1999) to make the HILs culturally appropriate, an effort was made to use pictures that would be familiar to the target audience. Although having the participants model for pictures in the HIL would have been ideal, the researcher had to use pictures sourced from the internet, as participants were reluctant to do so.

During the developmental process, attention was paid to the layout of each HIL. The design and layout of written materials are key elements that often attract readers (Center for Disease Control and Prevention, 2009). The question-answer format was used in all of the HILs because it provides a quick reference for the reader to identify information that is of interest to them (Boyd, 1987). Questions also served as effective subheadings, guiding readers logically through the content presented in the HILs (Paul, Redman, & Sanson-Fisher, 2003). This was a point that participants attested to during the evaluation process of the material.

It is recommended that researchers seek advice from professional designers to optimize the design of HILs, as appearance and formatting greatly influence the acceptability of the final product. In this study, the services of Rhodes University graphic designers were sought, as has previously been done in other HIL development studies (Francis et al., 2008; Kulukulualani et al., 2008).

4.17.3 Language and style

As the majority of participants had not attained an education above grade 12, the researcher aimed to use simplified language in the HIL. Overall, participants found the language used to be simple and easy to understand, with the exception of certain words that could not be avoided and required explanation from the researcher such as 'sodium chloride'. The HILs were written in the active voice, as recommended by Doak, Doak, and Root (1996) to engage the reader. According to Albert & Chadwick, (1992) that the active voice is a style suggested to achieve personalized patient communication. Corcoran & Ahmad, (2016) also state that engaging the reader through the use of the active voice may potentially increase the chances of the reader adopting the behaviours suggested.

4.18 Readability testing

Although the assessment of readability is a step that is strongly advocated for in written materials development, they are often unsuitable for the target audiences' literacy levels (Badarudeen & Sabharwal, 2010; Cherla et al., 2012; Cronin, O'Hanlon, & O'Connor, 2011). A study conducted by Davis, Crouch, Wills, Miller, & Abdehou, (1990) identified discrepancies between the readability of the materials they assessed and the target population they were developed for. According to French and Larrabee (1999), people with low literacy do not find written health information useful, as it is often not suited to their reading abilities. Recommended readability for written materials used in health education is between the 5^{th} - 6^{th} grades (Estey et al., 1991; Griffin et al., 2003).

Readability testing was conducted on the first and final drafts of the HILs. The average SMOG readability result for the first drafts of 'Salt and my health' and 'Reducing salt in my diet' HILs was 6th grade and that of 'Reading food labels' was the 8th grade. The FKGL yielded mean scores of the 3rd grade for the 'Salt and my health' and 'Reducing salt in my diet' and the 4th grade for the 'Reducing salt in my diet' HIL. As a result of using stricter criteria to assess the readability and classification of reading grade levels based on 100% comprehension ability, the SMOG often produces results up to two grades higher than the actual grade level of the written material (Friedman & Hoffman-Goetz, 2006; Meade & Smith, 1991). Readability results for the final draft remained the same for the 'Salt and my health' and 'Reading food labels' HILs for both readability tests. The 'Reducing salt in diet' HIL had a one grade level increase for both the SMOG and FKGL to the 7th and 4th grade respectively. The higher readability results for the 'Reading food labels' HIL may be influenced by the inclusion of multisyllabic words such as 'monosodium glutamate' and 'sodium bicarbonate'.

The use of the two readability tests was to ensure the reliability and validity of results as recommended by Davison & Bolt, (1981) and Doak & Doak, (2010). To address the discrepancy of using two different tests yielding different scores, the higher SMOG results were used to assess the 'literacy demand' criteria of the SAM. Meade & Smith, (1991) endorse the use of a higher score as it is better to overestimate reading difficulty than work on the premise that a material is readable.

Although the some of the readability scores obtained are above literature based recommendation no changes were made to HILs to alter the results. Weiss, (2007) reports that the over simplification of concepts and text in an attempt to improve readability makes it difficult to deliver accurate information. Readability formulae cannot be solely used as the determinant of well written information, as they do not assess other pertinent factors such as the format of text, the layout or style and the use of supplementary materials such as pictures that also facilitate the ease of understanding the information. Another limitation to the sole reliance on readability testing brought up by Klare, (1984) is that the reader's prior knowledge is not considered. Complex terms such as 'hypertension' may increase the readability of the 'Salt and my health' HIL. However, the readers' familiarity with the term (Redish & Selzer, 1985) or the fact that hypertension is explained and the use of the colloquial term 'high-high' which is familiar to all participants, are not considered in the assessment of readability (Bernier, 1993; Jenkins et al., 2015).

Another limitation considered was that the grade levels computed by the readability formulae relate to the educational system in the United States of America (Beaver & Luker, 1997). Ryan et al., (2014) warn against the assumption that that reading level is synonymous with educational attainment as educational standards possibly differ from country to country. Thus readability and American grade levels may not directly translate to the South Africa grade system and educational standards.

Mallioux, Johnson, Fisher, & Pettibone, (1995) encourage the use of computerised readability tests because of their convenience, ease and elimination of human errors. It is because of these reasons that online readability tests were used in this study. A noted disadvantage of using computer programmes to determine readability is that they over estimate readability (Pikulski, 2002). Despite this computerised programmes are frequently used in the readability assessment of health education materials (Badarudeen & Sabharwal, 2010; Kasabwala et al., 2013; Nasser et al., 2012; Shieh & Hosei, 2008).

4.19 Suitability assessment of the health information leaflets

According to Meade and Smith (1991), human elements such as visual attractiveness, cultural and motivation factors should also be considered in the development of written health materials. Numerous researchers have used the SAM to identify the positive or the negative elements in written materials that require revision or modification in order to improve the overall suitability of these materials (Finnie et al., 2010; Hoffmann & Ladner, 2012; Jahan, Al-Saigul, Alharbi, & Abdelgadir, 2014). Similar to a study conducted by Shieh and Hosei (2008), a training session on how to complete the SAM was conducted with the peer reviewers prior to their assessment of the HILs. The SAM was applied to the first and final drafts of the HILs. The first drafts scored an average of 63% (Adequate), 76% (Superior), and 64% (Adequate) for the 'Salt and my health', 'Reducing salt in my diet' and the 'Reading food label' HILs respectively. With the final HIL drafts, there was an overall improvement in the suitability of the materials. The final scores were 86%, 97%, and 88% for the 'Salt and my health', 'Reducing salt in my diet' and 'Reading food labels' respectively. Another reason for the use of the SAM was that its numerical scoring system would allow for comparison between the different drafts during the HIL development process. The individual scores from the evaluators varied, and this was due to the subjectiveness of the SAM criteria (Rhee et al., 2013; Shieh & Hosei, 2008; Vallance et al., 2008).

As recommended by Menghini (2005), the target population was involved in providing feedback on the HILs during the development phase during FGDs. The participants' inputs guided changes made to the HILs content and pictures, modifications that improved the written materials. This participatory step was fundamental to this study, as the goal was to create contextually specific and culturally appropriate HILs suitable for their needs. The participants' involvement in this step was also a reflection of the principles of Community Engaged Research applied in this study. The FGDs also offered an opportunity to discuss the written material, and this has been found to increase the chance of the information being retained (Kreuter, Chheda, & Bull, 2000). From this current study it was seen that FGDs were a beneficial method of developing HILs, similar to studies that used the same method (Asbury et al., 2005; McIntosh & Shaw, 2003; Moumjid et al., 2003).

4.20 Validation and cultural assessment of information

Kulukulualani et al., (2008) encourage content validation of written health materials. This is the primary method of ensuring the validity and accuracy of the information contained health education materials and is a crucial step in the development process (Perry et al., 2012; Renuka & Pushpanjali, 2013; Wao et al., 2014). The healthcare professionals consulted in this study were a medical doctor, dietician and two registered nurses. The non-healthcare professionals involved in the study were the African languages and cultural expert and the student wellness manager from Rhodes University. The assessment of the HILs from the perspective of individuals not directly involved in the study assisted in highlighting certain issues in the HILs that were unnoticed by the researcher. This panel provided valued inputs on the information to be added and the modifications to be made to the HILs as discussed by (Lawshe, 1975).

4.21 Actionability of health information leaflets

In this current study only the actionability component of the PEMAT was assessed, because the other components were similar to the evaluation criteria of the SAM (Shoemaker et al., 2014; Zellmer, Zimdars Bsn, Bs, & Safdar, 2014). The PEMAT was conducted by the peer evaluators on the first and final drafts of the HILs. The first drafts of the HILs 'Salt and my health', 'Reducing salt in my diet' and 'Reading food labels' scored average actionability scores of 96.67%, 93.33% and 66.67% respectively. There was an overall increase in the actionability of the final HILs with the 'Salt and my health',' Reducing salt in my diet' and 'Reading food labels' scoring average score of 100%, 100% and 96.67% respectively. The actionability scores for the final 'Salt and my health' and 'Reducing salt in my diet' HILs

show that they were highly actionable and were similar to those scored by the healthy lifestyle materials assessed in the study conducted by Lee et al. (2016). In this study we concluded that assessing actionability of the HILs during the development process was essential to inform improvements made to the HILs as this has also been encouraged by Kanchan et al. (2016).

4.22 Educational intervention

4.22.1 Rationale for interactive educational sessions

Knowledge is identified as a modifiable factor that mediates the influence of sociodemographic factors on the use of discretionary salt, and this offers an opportunity to implement consumer awareness and education, as these operate on this factor (Webster, Dunford, Hawkes, & Neal, 2011). As they are determinants of discretionary salt use, dietary recommendations, diet-disease relationships, and the salt content of commonly consumed foods were included in the study, as recommended by Sarmugam et al. (2013).

Effective nutrition education programs can empower individuals to improve their health and prevent NCDs (Campbell, Honess-Morreale, Farrell, Carbone, & Brasure, 1999). In the community based culturally-sensitive health education salt reduction conducted by Cappuccio, Kerry, Micah, Plange-Rhule, & Eastwood, (2006) in Ghana intensive health education was delivered in weekly sessions to the rural population. Other community based intervention have also employed similar methods sharing information through talks, and seminars facilitated by healthcare professionals as was done in this study (Aung et al., 2012; Farquhar & Fortmann, 1990; Kumanyika, 1991; Young, Haskell, Taylor, & Fortmann, 1996). McGinnis & Foege, (1993) emphasise the need for dietary intervention programs targeting lower income populations as they are affected by a disproportionate burden of NCDs. The concept of providing group health education focused on NCDs and lifestyle modifications in low socio economic populations in South Africa is frequently employed (Mash, Kroukamp, Gaziano, & Levitt, 2015; Parker, Steyn, Levitt, & Lombard, 2012) and this study is an extension of such efforts with the difference being its focus is dietary salt reduction.

Airhihenbuwa, Ford, & Iwelunmor, (2014) contend that in order for health promotion interventions to achieve significant and sustainable changes that bring about positive health outcomes culture must be considered. With this in mind the cultural norms of the target

population were considered not only the examples given during the interactive session but also through the delivery of information.

4.22.1 Post-intervention knowledge and practices

According to FAO, (2014) changes in knowledge after nutrition education are short term outcomes of the programme. In this current study there was an increase in the number of people were aware of the daily recommended knowledge. With regards to the relationship between salt and sodium, there was increase to two people who responded correctly. With regards to people correctly reading food labels the number increased from zero pre-intervention to three post-intervention. As seen in the study conducted by Garza, Westrick, Teeter, & Stevenson, (2013) knowledge based intervention can result in the improvement of post- intervention salt related knowledge. Based on the results from paired student t-test it can be deduced that the intervention was successful in increasing knowledge in some of the participants. Although behaviour change is the ultimate goal of health promotion interventions (Institute of Medicine (US) Committee on Health and & Behavior: Research, Practice, 2001), it is a complex process that takes time (Ryan, 2009). Equipping individuals with information on the positive effects of behavioural change does not guarantee that its adoption will be instantaneous(Anderson, Bulatao, & Cohen, 2004). Given the short implementation period of this study it is understandable that the participants have not undergone through the transitional steps to making behavioural changes (DiClemente & Prochaska, 1998).

4.23 Evaluation of research

Due to the emergence of new concepts, questions, and ideas during the implementation of health promotion programmes, their evaluation is complicated (Rootman et al., 2001). Health promotion is described as a 'process', illustrating that it is not an outcome but a means to an end (Nutbeam, 1998).Often, health promotion programmes are on-going, long-term, iterative processes, meaning they cannot be wholly and appropriately evaluated over a short period of time (Nutbeam, 1998; Rootman et al., 2001). Evaluating health promotion programmes is nonetheless essential, as it assists in determining whether programme objectives were achieved and highlights areas that require improvement (O'Connor-Fleming, Parker, Higgins, & Gould, 2006). However, the natural and complex settings in which health promotion programmes take place make evaluation of these programmes complicated, as not all variables can be controlled (Glass, 2000). Based on the complex characteristics of health

promotion, community based health promotion interventions are difficult to evaluate (Guba & Lincoln, 1989).

Nutbeam, (1998) proposes an application of process evaluation for health promotion programmes. Process evaluation encompasses all aspects of the process of delivering a health promotion programme. Process evaluation provides feedback on the quality of the intervention; identifies problems, solutions, conditions under which implementation will succeed. It increases knowledge of what components contribute to the outcomes achieved and allows for on-going modifications and improvements as the programme progresses (Linnan & Steckler, 2000; Tones, 1998; Victorian Government Department of Human Services, 2003).

The following stages were used in this study as part of the evaluation process:

Needs assessment

This study was guided by the Comprehensive Health Education Model. It was used to systematically plan both phases of the study. Through meeting with the key stakeholders involved with CBOs within the Grahamstown community in the needs assessment phase, the researcher was able to identify both community partners and the target population. A lack of interest from prospective participants in taking part in this study was encountered during participant recruitment. With the study being conducted in a low-economic setting and considering the unemployment rate in Grahamstown, a decision was made to remunerate recruited participants. The remuneration was to compensate the participants for their time dedicated to the study. Participant observation conducted at both centres provided the researcher with an opportunity to monitor the cooks' discretionary salt use during meal preparation. This stage also allowed the researcher to document the salt content of the processed foods used in both centres. Explorative SSIs were conducted with the cooks and guardians involved in the study to assess their knowledge, attitudes, and practices towards dietary salt reduction. SSIs are a qualitative data collection method frequently employed when conducting needs assessments (National Health Care for the Homeless Council, 2010; Pololi, Dennis, Winn, & Mitchell, 2003). After thematic analysis of collected data, gaps in their salt reduction related knowledge and practices was identified. Through these stages of data collection, the researcher was able to identify the educational needs of the participants that would form the foundation and focus of the educational intervention.

Intervention

After identifying knowledge gaps within the target audience, three main topics to be addressed by the HILs and the educational intervention were determined. The selection of these three main topics, 'Salt and my health', 'Reducing salt in my diet', and 'Reading food labels' was also based on the fact that they were the focus of existing salt reduction campaigns and written materials. Due to its contribution to the success of educational interventions (Glanz et al., 1997) the constructs of the SCT theory were applied in the planning of the educational interactive sessions conducted with the participants. External evaluators consisting mainly of health care professionals were involved in various steps in the development process to ensure content validity and cultural appropriateness. Their recommendation were considered and applied to the materials. As part of the participatory HIL development process, participants were requested to provide feedback on the developed HILs in FGDs conducted after each interactive session of the same topic. Participants' participation and input was valuable to the HIL development process, as the aim was to produce culturally appropriate and contextually specific materials and reflected the principles of community engaged research applied in this study (Callister, 2016; Kulukulualani et al., 2008). Lack of critical feedback from the participants, resulted in the principal supervisor's decision to involve Rhodes University peer educators. They were also involved in three workplace health promotion studies being conducted at Rhodes University. Modifications suggested by the participants and peer educators were made to the HILs.

Implementation

The effectiveness of any health promotion programme's implementation is influenced by factors such as the community (Durlak & DuPre, 2008), the facilitator (Berkel, Mauricio, Schoenfelder, & Sandler, 2011), and the programme itself (Little, Sussman, Sun, & Rohrbach, 2013). The characteristics of the community play a crucial role in the implementation of a programme. It is therefore necessary to develop a culturally appropriate and contextually specific programme that is tailored for the target audience, as these factors influence its success (Witte, 1995). Inability to do this results in a programme with which target audiences cannot relate (Castro, Barrera, Jr., & Martinez, Jr., 2004; Garst & Mccawley, 2015). Through the needs assessment phase and time spent interacting with the participants the researcher gained insight on cultural factors that would need to be addressed in the intervention to improve its chances of success. The community members that volunteered to

be involved in the study were supportive of the programme. The educational interactive sessions were facilitated by a retired nurse from the Grahamstown community who was aware of the existing cultural norms, and applied them in her delivery of the information. By so doing, she created a comfortable environment that left participants receptive to the health messages. The facilitator's ability to use IsiXhosa when necessary and the use of simplified language during the sessions and in the HILs show consideration of the target audience's low literacy level. Sessions and FGDs were limited to 45 minutes to 1 hour, and were conducted weekly for four weeks. Considerations of language and information complexity as well as the length of the educational sessions were of great importance, because they influenced programme implementation (Perepletchikova, Treat, & Kazdin, 2007). The participants' receptiveness to the programme also serves as an indicator of the success of the programme's implementation (Gagnon et al., 2015). Interactive sessions empowered the participants through the provision of new knowledge. Based on inputs received from the participants during evaluation of the study conducted through FGDs it was seen that the participants pleased with the manner in which the study was conducted. Participants commented that the sessions and HILs were informative and interesting, providing them with knowledge that some were keen to share with others.

Programme evaluation and sustainability

As this study included principles of community engaged research, it is important that the communities where the research took place to actively participate and benefit and that the research is sustainable. Key stakeholders involved at the CBOs assured that the dietary salt reduction HILs would be incorporated into their existing health promotion activities, ensuring sustainability of the research. The HILs will also be made available to the Rhodes University peer educators and the Rhodes University Institutional Wellness Officer has guaranteed that they will be used in future health promotion endeavours targeted towards Rhodes University support staff. During this study, the HILs formed part of a training programme on NCDs conducted at Rhodes University for the peer educators (Rhodes University, 2017).

CHAPTER 5: CONCLUSION

5.1 Introduction

This chapter will focus on the conclusions reached as a result of this study, as well as on the strengths, limitations, and recommendations based on the results obtained by it.

5.2 Conclusion

The aim of this study was to identify the dietary salt related knowledge, attitudes, and practices of cooks and guardians at two CBOs in Grahamstown, and subsequently to develop and implement an educational intervention promoting dietary salt reduction.

The cooks' use of discretionary salt during meal preparation highlighted the need to provide practical tips, such as measuring salt using a teaspoon instead of their hands. The processed foods available at both centres mostly contained low to medium quantities of salt, and were mainly used because of their convenience. Results from the SSI revealed that participants were unaware of daily salt recommendations and the relationship between salt and sodium. This knowledge is necessary, particularly if individuals are contemplating initiating dietary salt reduction in their lives. It was seen that most participants were aware of the association between high salt diets and hypertension, information that most received from health care professionals. This emphasises the significant role played by health care professionals in imparting health promotion messages. These findings indicate the lack of declarative knowledge with regards to dietary salt reduction, which would need to be addressed through the educational intervention.

Having the majority of the participants being the responsible for purchasing groceries in their own households further confirms that the appropriate target group was identified for this study. Empowering these women with salt reduction knowledge would not only benefit them but also their families and the greater community. Gaps in procedural knowledge, the knowledge required to perform practical tasks, was identified through the participants' self-reported food label reading behaviour and their inability to identify the correct food label during the SSIs in the needs assessment phase. Findings on the participants' discretionary salt use in food preparation and meal times also necessitate addressing procedural knowledge in the educational intervention. Findings regarding the cultural or religious uses of salt corroborate how widespread these practices are, indicating that they could be potential barriers to population-wide salt reduction strategies in South Africa.

The educational intervention was centred on the participatory development of three salt reduction HILs and educational interactive sessions. Content of the HILs was designed to address the knowledge and practise gaps identified during the needs assessment. Based on readability, suitability, and actionability results, the HILs catered to the literacy levels of the target audience, were of superior ratings, and the information they contained was actionable. Participants, peer educators, health care professionals, and the language and cultural expert's involvement in the participatory development of the HILs assisted in creating culturally appropriate and contextually specific health promotion materials, as intended. Involvement of members of the target audience was essential, as principles of Community Engaged Research were employed in this study. Participants deemed the HILs to be informative, relevant, and useful. The sessions were conducted on three main topics: 'Salt and my health', 'Reducing salt in my diet', and 'Reading food labels'. The constructs of SCT, behavioural capability, observational learning, reinforcements, and self-efficacy were applied during the planning of the educational interventions. The sessions provided an opportunity to deliver information aimed at addressing the knowledge gaps identified in the needs assessment phase, potentially increasing the participants' knowledge. The use of the CHEM in the planning process of this study assisted in the development of a well-structured study. Proving that the integration of theoretical models in health promotion programmes is imperative.

This study highlights the need for culturally appropriate and contextually specific salt reduction consumer awareness and educational programmes and materials. Considerations of culture and contextual specificity improve the acceptance of health promotion programmes by the intended recipients. Tailored health promotion programmes focused on NCDs, particularly in LMICs such as South Africa, are essential in the fight against the epidemic rise NCDs and in achieving SDG 3 by the year 2030.

5.3 Strengths and limitations

The sample size of participants (n=19) involved in this contextually specific research was not a representative sample size for nutrition education interventions where ideally n=30. Due to the limited number of participants willing to take part in the study, participant dropout was not factored in the sample size of this study. Results obtained thus cannot be generalized beyond the sample population, as contexts differ between different CBOs and different communities throughout South Africa.

This was an intervention study based on a qualitative study. The semi-structured interview process and the use of an interpreter may have influenced responses received from participants. During the FGDs, inputs regarding the HILs from the participants may have been influenced by social desirability bias. The strengths of this study include the focus on contextual and cultural factors that influence both the behaviour and health literacy of the target audience. This emphasised how the consideration of the unique characteristics of community is essential in order to effectively meet their health educational needs. The health promotion efforts in this study were informed by the specific dietary salt reduction knowledge and awareness of the target population and not general knowledge.

This research was further strengthened by the involvement of external evaluators and of the target audience in the participatory development of the HILs. The HIL development process undertaken in this study is well detailed, with each step rationalised and can be adapted by other health practitioners Although the research had a small sample size, and was confined to two communities, it is trustworthy, as methods to validate the research findings were employed. This study is also strengthened by the involvement of CBOs in the research process, as they provide the appropriate platform for health promotion in their respective communities.

5.4 Recommendations for future research

From the aforementioned conclusions, the following recommendations are made for future research projects:

5.4.1 Expanding the research

This study was conducted in only two CBOs and was limited by a Master's project timeframe and a small research team. Future research could expand to include more CBOs and increase the number of participants involved to provide greater insight on dietary salt related knowledge and practices. We also recommend exploring the participants' attitudes towards dietary salt reduction which was not done in this study.

5.4.2 Evaluation of impact of research

Due to the short time period between the educational intervention and the post intervention assessment, the impact of this study and of the developed HILs on the participants' behaviours were not assessed. We recommend a follow up study to determine the long term impact of this study on behaviour as well as on knowledge.

5.4.3 Training of volunteer salt reduction agents

We recommend the training of volunteers from the community and the cooks from CBOs as salt reduction agents. Their role will involve promoting dietary salt reduction within their communities through organised talks and activities to raise awareness.

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7. Appendices

7.1 Appendix A: Phase 1 ethical approval

RHODES UNIVERSITY
Where leaders learn

Faculty of Pharmacy
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24 June 2015

Dear Fadzai Mushoriwa

RE: Ethical approval by the Faculty of Pharmacy's Ethics Committee
(Tracking number PHARM 2015 - 6)

As a postgraduate student in the Faculty of Pharmacy – with student number 11M0089 - I am pleased to inform you that the Faculty of Pharmacy's Ethics Committee grants you ethical approval for **Phase 1** of your research entitled:

Health Promotion: Approaches to Dietary Salt.

Please note that you will need to submit your proposal for Phase 2 of your research once Phase 1 has been completed.

Please ensure that the Faculty of Pharmacy's Ethics Committee is notified should any substantive change(s) be made, for whatever reason, during the research process.

Sincerely

C. Oltmann

Carmen Oltmann, PhD
Chairperson of the Faculty of Pharmacy's Ethics Committee

FACULTY OF PHARMACY
RHODES UNIVERSITY
GRAHAMSTOWN 6139
SOUTH AFRICA

7.2 Appendix B: Ethical approval for participant remuneration

RHODES UNIVERSITY

FACULTY OF PHARMACY
Tel: +27 (0)46 603 8381 • Fax: +27 (0)46 603 7906 • E-mail: dean.pharmacy@ru.ac.za • PO Box 94, Grahamstown, 6140, South Africa

20 November 2015

Dear Fadzai Mushoriwa

RE: Ethical approval by the Faculty of Pharmacy's Ethics Committee (Tracking number PHARM 2015 - 6)

As a postgraduate student in the Faculty of Pharmacy – with student number 11M0089 – I am pleased to inform you that the Faculty of Pharmacy's Ethics Committee grants you permission to provide your participants with a R30 gift voucher for participating in your research entitled:

Health Promotion: Approaches to Dietary Salt.

Please ensure that the Faculty of Pharmacy's Ethics Committee is notified should any substantive change(s) be made, for whatever reason, during the research process.

Sincerely

C. Oltmann

Carmen Oltmann, PhD
Member of the Faculty of Pharmacy's Ethics Committee

7.3 Appendix C: Phase 1 participant invitation letter

Health Promotion: Approaches to Dietary Salt Informed Consent Form

Faculty of Pharmacy, Rhodes University

Participant Invitation Letter

Dear Participant

My name is Fadzai Mushoriwa. I am a Masters student in the Faculty of Pharmacy, Rhodes University.

You are kindly invited to take part in this study. This invitation serves to inform you about the research being undertaken and what would be required of you throughout the study should you decide to participate. Please feel free to ask any questions about the study. If you wish to take part, you will be asked to sign a consent form, which will also be explained to you.

What is the study about?

The aim of this study is to design and implement an educational intervention on dietary salt reduction at St Mary's DCC and Assumption Sisters Nutrition Centre in Grahamstown.

Participants

Participants in this study are employees of the St Mary's Development Care Centre and Assumption Sisters Nutrition Centre as well as parents/guardians from the community.

What will we ask you to do?

If you agree to take part in this study, you will participate in a semi-structured interview with the researcher and an interpreter. If at any point you would like to withdraw from the interviews you may do so. During the interview, you will be asked questions about how you prepare your meals and the food you eat. You are allowed to ask questions anytime during the study. A voice recorder will be used during the interview.

After this step you will be asked to take part in an educational intervention and another semi-structured interview.

Confidentiality

To guarantee your privacy, you will be allocated a participant number that will be used during the semi-structured interviews for identification instead of your name. The personal information provided and your responses to the interview questions will be used for research purposes only.

Benefits

You will gain valuable information that will help you improve your health and that of your family.

Any queries can be directed to me, Fadzai Mushoriwa, or Prof Srinivas of the Rhodes University Faculty of Pharmacy. Our contact details are listed below:

Name of researcher: Fadzai Mushoriwa
Contact details: g11m0089@campus.ru.ac.za
0767473291
Name of supervisor: Prof Sunitha Srinivas
Contact details: s.srinivas@ru.ac.za
Faculty of Pharmacy
Rhodes University
Thank You
Fadzai Mushoriwa

7.4 Appendix D: Phase 1 participant informed consent form

Health Promotion: Approaches to Dietary Salt (Tracking number PHARM2015-6)

Faculty of Pharmacy, Rhodes University

Informed Consent Form

1. I confirm that Fadzai Mushoriwa has explained what is written in the Participation Invitation Letter.

2. I understand what is written in participant invitation letter, and that I will take part in semi-structured interviews and discussions. I understand that I will have the chance to ask question anytime I wish. I understand that I can choose to take part in the study and that I can withdraw when I want.

3. I understand that data collected during the study will be used by the researcher, but that all details gathered during this research, especially my name or any information from which my identity could be known, will be kept confidential.

4. I give permission to Fadzai Mushoriwa and the interpreter/facilitator to ask relevant questions when I take part in the study.

5. I give permission to Fadzai Mushoriwa to voice record the interviews during the study.

6. I agree to take part in this study.

Name of Participant.....

Date.....

Signature.....

Declaration

I, Fadzai Mushoriwa (the researcher) state that any personal details obtained during this research study will remain strictly confidential.

Signature (Researcher).....

Date.....

Name of witness.....

Signature.....

Date.....

7.5 Appendix E: SSI question guide

Health Promotion: Approaches to Dietary Salt (Tracking number PHARM2015-6)

Faculty of Pharmacy, Rhodes University

SSI Question Guide

Demographics

Name	
Participant identifier	
Age	
Contact number	
Gender	
Highest education level	
Home language	
Do you have any non-communicable diseases	

*These questions will be used to assess post intervention changes in knowledge.

Salt knowledge

1. How much salt do you think you eat in a day?

A. A lot	B. Enough	C. A little

*2. Do you know how much salt you are supposed to eat per day?[1] If yes, how much?

No[0]	Yes [2]

3. Have you heard anything about reducing salt in your diet? If yes from where (radio, tv)?

Yes	No

Food labels

5. Who does the grocery shopping in your household?

Myself	Other(specify)

6. Do you read food labels when you are shopping? If yes, why do you read food labels?

No[0]	Yes[2]

*8. Please tell me how much salt is in this product? (Reading food label below)

Incorrect [0]	Correct [2].

*9. Do you know the difference between salt and sodium? If yes, please explain.

Incorrect[0]	Correct [2]

Health and perception related

10. Do you think eating a lot of salt is good for your health? Please explain?

Yes	No

11. Do you know any diseases/conditions that are caused by eating too much salt? If yes, please explain.

Yes	No

Lifestyle and Practice

12. Do you add salt when you are cooking?

Yes	No

13. If yes, how do you measure the salt you add?

By hand.	teaspoon.	tablespoon.	Other(specify)

14. Do you add spices, stock cubes or soup bases when you cook? If yes, please give me examples.

Yes	No

15. Do you use herbs when you cook? If yes, please give me examples.

Yes	No

16. Do you use canned foods when cook? If yes, please give me examples.

Yes	No

17. How often do you use canned foods?

More than three times a week	Once or Twice a week.	Occasionally

18. Do you add salt to your food after cooking?[1]

Yes	No

19. If yes how often?

Always	Occassionally	Never

20. Do you know any cultural or religious uses of salt?

NUTRITIONAL INFORMATION		
Typical Values	Per **100g** as packed	Per 20 g serving (approximately 3 crackers) (As packed)
Energy	2063 kJ	413 kJ
Protein	9.8 g	2.0 g
Carbohydrate	10.6	1.8
Of which total sugars	8.0	6.2
Total Fat	19.8	4.0 g
Total Sodium	348mg	116 mg

7.6 Appendix F: Phase 2 ethical approval

RHODES UNIVERSITY

[illegible]

FACULTY OF PHARMACY

[illegible]

5th February 2016

Dear Prof. Srinivas and Ms. Mushoriwa

Re: Ethical approval by the Faculty of Pharmacy's Ethics Committee
(Tracking Number PHARM 2016-03)

We are pleased to inform you that the Faculty of Pharmacy's Ethics Committee grants you ethical approval for your research entitled:

Health promotion: Approach to Dietary Salt.

Please ensure that the Faculty of Pharmacy's Ethics Committee is notified should any substantive change(s) be made, for whatever reason during the research process.

Sincerely,

Roman Tandlich, PhD

Deputy Chairperson of the Faculty of Pharmacy's Ethics Committee

7.7 Appendix G: Phase 2 participant invitation letter

Health Promotion: Approaches to Dietary Salt Informed Consent Form
Faculty of Pharmacy, Rhodes University
Participant Invitation Letter

Dear Participant

My name is Fadzai Mushoriwa. I am a Masters student in the Faculty of Pharmacy, Rhodes University.

You are kindly invited to take part in Phase 2 of this study. This invitation serves to inform you about the research being undertaken and what would be required of you throughout the study should you decide to participate. Please feel free to ask any questions about the study. If you wish to take part, you will be asked to sign a consent form, which will also be explained to you.

What is the study about?

The aim of this study is to design and implement an educational intervention on dietary salt reduction at St Mary's DCC and the Assumption Sisters Nutrition Centre in Grahamstown.

Participants

Participants in this study are cooks of the St Mary's Development Care Centre and Assumption Sisters Nutrition Centre as well as guardians from the community.

What will we ask you to do?

If you agree to take part in this study, you will participate in an educational interactive sessions and focus group discussions (FDGs) to evaluate developed health information leaflets (HILs) with the researcher, and a facilitator. If at any point you would like to withdraw from the study you may do so. During the educational intervention there will be talks relating to dietary salt reduction. During the FGDs you will be asked to give your opinion on HILs. You are allowed to ask questions anytime during the study. A voice recorder will be used during the sessions and the FGDs.

After this step you will be asked to take part in a semi-structured interview with the researcher and an interpreter.

Confidentiality

To guarantee your privacy, you will be allocated a participant number that will be used during the study for identification instead of your name. The personal information provided and your responses to the interview questions will be used for research purposes only.

Benefits

You will gain valuable information that will help you improve your health and that of your family. You will also be given a R50 voucher at the end of the study as a token of appreciation for your time.

Any queries can be directed to me, Fadzai Mushoriwa, or Prof Srinivas of the Rhodes University Faculty of Pharmacy. Our contact details are listed below:
Name of researcher: Fadzai Mushoriwa
Contact details: g11m0089@campus.ru.ac.za
0767473291
Name of supervisor: Prof Sunitha Srinivas
Contact details: s.srinivas@ru.ac.za
Faculty of Pharmacy
Rhodes University
Thank You
Fadzai Mushoriwa

7.8 Appendix H: Phase 2 informed consent form

Health Promotion: Approaches to Dietary Salt (Tracking no. PHARM2016-17)

Faculty of Pharmacy, Rhodes University

Informed Consent Form

1. I confirm that Fadzai Mushoriwa has explained what is written in the Participation Invitation Letter.

2. I understand what is written in participant invitation letter, and that I will take part in educational interactive sessions, focus group discussions (FGDs) and semi-structured interviews (SSI). I understand that I will have the chance to ask question anytime I wish. I understand that I can choose to take part in the study and that I can withdraw when I want.

3. I understand that data collected during the study will be used by the researcher, but that all details gathered during this research, especially my name or any information from which my identity could be known, will be kept confidential.

4. I give permission to Fadzai Mushoriwa and the interpreter/facilitator to ask relevant questions when I take part in the study.

5. I give permission to Fadzai Mushoriwa to voice record the educational talks, FGDs and SSIs during the study.

6. I agree to take part in this study.

Name of Participant.....

Date.....

Signature.....

Declaration

I, Fadzai Mushoriwa (the researcher) state that any personal details obtained during this research study will remain strictly confidential.

Signature (Researcher).....

Date.....

Name of witness.....

Signature.....

Date.....

7.9 Appendix I: Ethical approval to include Rhodes University peer educators as participants

RHODES UNIVERSITY

14 October 2016

Dear Faiza Mushoriwa

RE: Ethical approval by the Faculty of Pharmacy's Ethics Committee
(Tracking number PHARM 2016 - 17)

The Faculty of Pharmacy's Ethics Committee grants you ethical approval for inclusion of Rhodes University Peer Educators as participants in your research entitled:

Health Promotion: Approaches to Dietary Salt

Please ensure that the Faculty of Pharmacy's Ethics Committee is notified should any substantive change(s) be made in this research, for whatever reason.

Best wishes

Dr. Roman Tandlich
Deputy Chairperson
Faculty of Pharmacy's Ethics Committee

7.10 Appendix J: Suitability assessment of materials

Suitability Assessment of Materials score sheet		
Name of reviewer (optional): **Title of publication:** **Date:**		
1. Content	(a) Purpose is evident	
	(b) Content about behaviours	
	(c) Scope is limited	
	(d) Summary included	
2. Literacy demand	(a) Reading grade level • Superior= 5th grade or lower • Adequate=6th -8th grade • Not suitable= 9th grade and above	
	(b) Writing Style, active voice used	
	(c) Vocabulary	
	(d) Context given	
	(e) Advance organisers	
3. Graphics	(a) Cover graphic shows purpose	
	(b) Type of graphics used	
	(c) Relevance of illustrations	
	(d) Lists and tables explained	
	(e) Captions used for graphics	
4. Layout and typography	(a) Layout factors	
	(b) Typography	
	(c) Subheadings used	
5. Learning stimulation and motivation	(a) Interaction used	
	(b) Behaviours are modelled and specific	
	(c) Motivation	
6. Cultural appropriateness	(a) Cultural match	
	(b) Cultural image and examples	
	Total score	

7.11 Appendix K: Patient Education Material Assessment Tool

Patient Education Materials Assessment Tool for Printable Materials score sheet			
Reviewer Name (optional): Title of Publication: Date:			
ACTIONABILITY			
	Item	Response Option	Rating
18.	The material clearly identifies at least one action the user can take.	Disagree=0, Agree=1	
19.	The material addresses the user directly when describing actions.	Disagree=0, Agree=1	
20.	The material breaks down any action into manageable, explicit steps.	Disagree=0, Agree=1	
21.	The material provides a tangible tool (e.g., menu planners, checklists) whenever it could help the user take action	Disagree=0, Agree=1	
22.	The material provides simple instructions or examples of how to perform calculations.	Disagree=0, Agree=1, No calculations=NA	
23.	The material explains how to use the charts, graphs, tables, or diagrams to take actions.	Disagree=0, Agree=1, No charts, graphs, tables, or diagrams=N/A	
24.	The material uses visual aids whenever they could make it easier to act on the instructions.	Disagree=0, Agree=1	

7.12 Appendix L: FGD question guide

Content:

Is the purpose of the HIL evident?

Is there any content in the HIL that you think is unnecessary? Elaborate.

Literacy demand:

Is there any information you do not understand? Elaborate.

May you please point out any complex words in the HIL.

Graphic:

May you point out any inappropriate pictures?

What does picture X represent (all pictures in HIL)?

May you point out any unclear picture?

Layout and typography:

Comment on the design and layout of the HIL?

Does the font size allow for easy reading?

Learning stimulation and motivation:

Do you think you are able to act on the information given in the HIL?

Do you think the information given would motivate the reader to adopt healthier lifestyle choices?

Cultural appropriateness:

Are there any aspects of the HIL that are culturally insensitive? Elaborate.

Activity:

Would you take time to do the activity after reading the HIL?

Do you find the activity useful? Why?

7.13 Appendix M: Educational interactive session programme

Themes and content	Methods	Key concepts and application
Greetings Introduction	Greeting in the local language where possible Introduce the aims and objectives of the educational programme	• Motivation to reduce dietary salt intake
Salt and my health		
1. Salt and sodium	Explain difference between salt and sodium. Brief description of the role of sodium in the body. Show current South African average daily salt intake. Explain the recommended daily salt intake.	Emphasis on the positive outcomes of reducing daily salt intake.
2. Salt and Health	Explanation of health consequences of excessive salt consumption e.g. hypertension and other conditions. Explanation of how salt affects blood pressure. Explanation of other causes of hypertension.	Gaining knowledge on the concept of salt and sodium. Raising awareness on the issue of current salt intake and the recommended daily intake.
Reducing salt in my diet		
1. Sources of salt in the diet	Explain the major sources of salt in the South African diet and compare salt quantities.	Reinforcement to reduce salt intake
2.Reducing salt intake	Provide salt reduction tips.	Reinforcement to reduce salt intake
Reading food labels		
3.Reading food labels	Explain the importance of reading food labels.	Providing knowledge necessary to reduce salt intake
	Step by step guide of reading food labels	Providing knowledge necessary for reading food labels

7.14 Appendix N: Final 'Salt and my health' HIL

Page 1

Other major causes of high blood pressure

What can I do to prevent high blood pressure?

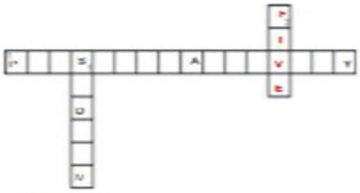
- Lower the amount of salt you eat;
- Eat more fruits and vegetables;
- Eat food with less unhealthy fats;
- Be physically active by walking, gardening, and household work.
- Maintain a healthy weight.
- Get your blood pressure checked regularly.

If you:

- Smoke, reduce the number of cigarettes you smoke as much as you can.
- Drink alcohol, cut down on the amount you drink as much as you can.

ACTIVITY

This is a crossword puzzle to help you remember how salt affects your health. Give it a try!



Across

1. By doing this you can prevent high blood pressure

Down

1. The part that makes up salt
2. How many grams of salt should you eat in a day?

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SALT AND MY HEALTH

Page 2

What is salt?

- Salt is a compound made up of two parts: **sodium** and **chloride**.
- You use salt every day when you cook and eat your meals.
- Salt is found in processed foods such as bread, margarine and sausages.

How much salt can I eat to remain healthy?

- Between all the meals and snacks eaten in a day, an adult should only eat 5g of salt.
- Children should eat less than 5g of salt in day.

5g of salt is about 1 teaspoon of salt

What does salt do to my health?

A diet that is high in salt is not good for your health.

It can cause diseases such as:

- High blood pressure ('high-high')
- Stroke
- Damaged eyes and brain
- Kidney stones
- Stomach cancer
- Asthma may become worse.

What is high blood pressure (high-high)?

- Blood pressure measures the force on the walls of blood vessels when the heart pumps blood.
- Normal blood pressure is 120/80 mm Hg.
- High blood pressure means that there is too much pressure on your heart and blood vessels.
- The pressure makes it hard for the heart and blood vessels to pump and carry blood around your body.
- Uncontrolled high blood pressure can cause a heart attack and/or a stroke.

Person having their blood pressure checked.

How does salt affect my blood pressure?

- The more salt you eat, the more water is stored by your body. Too much water in the blood vessels means that there is more blood making it difficult for the heart to pump.
- This will result in a blood pressure reading of more than 120/80 mm Hg.

7.15 Appendix O: Final 'Reducing salt in my diet' HIL

Page 1

Did you know you can grow your own herbs?

You will need:

- Empty water bottles
- Rosemary, thyme, or parsley seeds, or other plants used flavour food
- Soil
- Water

Instructions:

1. Cut a section from the top half of the water bottle.
2. Add soil into the bottle.
3. Place the herb, plant or seed into the soil and water it.
4. Place the bottles outside or by a window where there is sunlight.
5. Water your herbs and when they are ready, enjoy cooking with them!

Use old water bottles or lunchboxes to grow your herbs

Activity

Below is a word search to remind you of foods that are high in salt. The words go forward, backward, up and down. Give it a try!

P	L	E	M	O	N	S	I	G	Q	C	T
A	D	P	S	A	U	S	A	G	E	S	O
R	O	S	E	M	A	R	Y	J	W	U	M
S	E	V	I	N	E	G	A	R	M	I	A
L	M	A	R	G	A	R	I	N	W	W	T
E	S	T	O	C	K	C	U	B	E	S	O
Y	C	D	D	W	K	O	N	I	O	N	E
G	A	R	L	I	C	B	R	E	A	D	S

Stock cubes
Bread
Margarine
Sausages

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Grahamstown
February 2017

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Reducing Salt in My Diet

Page 2

Where does the salt in my diet come from?

The salt in your diet comes from processed food, the salt you add when you cook and eat your meals, and the salt naturally found in food.

Which foods are high in salt?

The foods listed below are high in salt.

Bread

Margarine

Stock cubes

Tinned food such as peas

Processed meats such as boerewors and sausages

How can I reduce the salt in my diet?

- Reduce the amount of salt you add when you are cooking.
- Measure your salt with a teaspoon when you prepare meals.
- Slowly cut down on foods that are high in salt.
- Taste your food before adding salt.
- Replace salt with herbs such as parsley, mixed herbs or rosemary when you are cooking.
- For flavour, add natural spices like curry powder, garlic and black pepper and avoid high salt spices.
- Add vegetables to add extra flavour, like onion, tomatoes and green peppers.

Onions and green peppers

- Rinse tinned foods such as peas in brine with water before use to remove extra salt.
- Use lemon juice and vinegar to add flavour to your food.

Lemons

- Remove salt shakers from the table where you eat.
- When shopping, look out for the other names for salt such as Monosodium glutamate (MSG).

Stock recipe

Make your own beef or chicken stock instead of buying stock cubes.

Ingredients

- Chicken or beef bones
- Black pepper or any other spices
- Mixed herbs
- Onions/ ginger/ garlic

Method

Add the ingredients to a pot with 1 litre of water. Boil for 1 hour. Pour into a container and store in the fridge. Use within 3 days.

Use this stock when you cook instead of using processed stock cubes, which are high in salt.

7.16 Appendix P: Final 'Reading food labels' HIL

Page 1

You should try to avoid foods that **have over 600mg** of sodium per 100g, because they have a lot of salt.

HIGH SALT FOODS
Over 600mg sodium per 100g

Stock cubes, margarine, barbeque or chicken spice, processed meat

REMEMBER!

- Between all the meals and snacks we eat every day, we should aim to eat less than a teaspoonful of salt each day.
- Processed or ready made foods contain a lot of hidden salt.
- Look out for the other names of salt such as mono-sodium glutamate (MSG)

Activity

Link the words with their matching phrase. Give it a try!

Food with less than 120 mg sodium per 100g	Second best choice
Food with 120 mg to 600 mg sodium per 100g	Try to avoid
Food with more than 600 mg sodium 100g	Best choice

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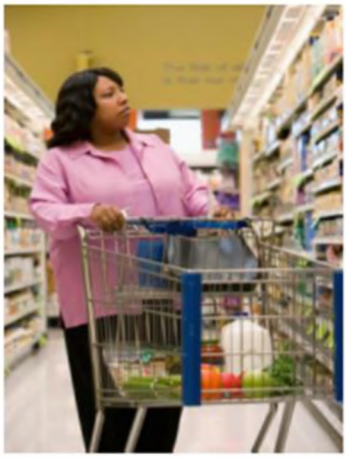
The Tellabres Network

Reading Food Labels



Page 2

Why read food labels?

It is very important to read food labels because they:

- Provide information about the nutrients and energy in the food;
- Show you how much salt is contained in the food.

Why is salt added to processed food?

Salt is added to food enhance taste, keep it fresh and to improve it's appearance.

How do I read food labels?

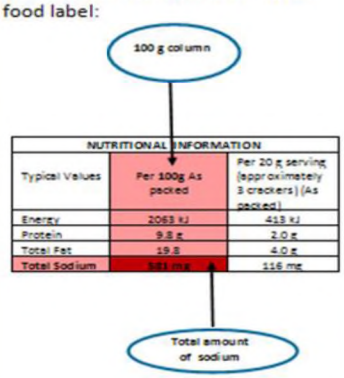
Step 1: Look for the food label on the back of the processed food container.

Food label on the back of a tin

Step 2: Salt has many different names. When reading the food label, look out for these words:

- **Sodium**
- **Sodium Chloride**
- **Monosodium Glutamate (MSG)**
- **Sodium Bicarbonate**
- **Baking Powder**

Step 3: Look at the amount of **sodium** in the 100g column of the food label:



Step 4: Check in the table below if the amount of sodium is **Low, Medium** or **High:**

Level	Low	Moderate	High
Amount of salt	120 mg or less per 100g	120 - 600mg per 100g	600 mg or more per 100g

Which products should I pick?

Foods that have **less than 120mg** of sodium per 100g are the **Best Choice,** and you should eat them often.

LOW SALT FOODS
Less than 120mg of sodium per 100g

Fresh foods such as fruits, nuts, vegetables, fresh chicken, fish and meat.
Processed foods such as mealie meal,.
Natural spices such as ginger, garlic, cloves and herbs.

Foods with **120mg-600mg** of sodium per 100g are the **second best option.**

MEDIUM SALT FOODS
120mg to 600mg sodium per 100g

Processed foods such as Bread, baked beans and tinned fish.