THE EFFECT OF A BACK PAIN CAMPAIGN ON BACK BELIEFS, COPING STRATEGIES AND PARTICIPANT ACTIVATION FOR NURSES IN LUSAKA, ZAMBIA.

STUDENT: LOVENESS NKHATA. A

Doctoral dissertation

Supervisors: Prof. Quinette Louw

Dr Yolandi Brink

Dr Dawn Ernstzen

This research project has been submitted as part of the academic requirements for the award of the Doctor of Philosophy Degree in Physiotherapy - Musculoskeletal Disorders at Stellenbosch University

DECLARATION

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ABSTRACT

Introduction: The prevalence of back pain in nurses globally is high and ranges from 55-84%. In Africa, the prevalence of back pain reported in different studies among nurses ranges from 33%-73.5%. While, in Zambia the reported prevalence for back pain among nurses is 58.3%. Nurses are exposed to labour intensive, repetitive tasks which are often performed in stressful postures. Furthermore, the high occurrence of back pain in nurses is of major concern because it decreases working efficiency and affects the safety of the patients and healthcare outcomes.

Aim: The overall aim of this study was to design and assess the effects of a cross-culturally validated back pain campaign on back beliefs, coping strategies and participant activation for nurses in Lusaka, Zambia.

Research setting: The research was done in Lusaka at Chawama, Chingwere, Chilenje, Chelstone and Kayama first level hospitals. The hospitals provide various health services and public health programmes at community level. The hospitals were purposefully selected as study sites because of the substantial number of nurses working at the centres and their similarity in operation level and system compared to the other centers.

Methodology: Three studies, with different methodologies based on the principle of evidence-based practice (EBP), were carried out as follows:

Study 1: A systematic review of self-management education campaigns on back pain, with the aim to retrieve and synthesise the content, mode, and duration of published evidence based on lower back pain (LBP) campaigns, and to describe the outcomes and the effectiveness of the campaigns.

Study 2: Cross-cultural validation and formulation of key evidence-based back pain messages for nurses in Zambia. The aim was to ascertain which local contextual factors could influence the understanding, feasibility and uptake of evidence-based messages reported in published campaigns. In addition, it was aimed to design the campaign based on the information obtained in Study 1 and ascertain content validation with experts.

Study 3: A pre-post quasi-experimental study to evaluate the effectiveness of a cross-cultural validated back pain campaign for nurses in Lusaka, Zambia, regarding on-participant activation and back beliefs as key outcomes.

Results: Articles reviewed (Study 1) had back campaigns conducted in the general population. It was reported that participant activation, awareness, and satisfaction about back pain improved in the general population as an overall effect of the campaigns. Messages delivered during the campaigns were cited as having been helpful in decreasing effects of pain disability and in improving work

outcomes by influencing population attitudes and beliefs. Fourteen back pain messages were retrieved, synthesised (Study 1) and cross-culturally validated for implementation among nurses in Zambia (Study 2). All the back pain messages except for one ("back pain is rarely caused by a dangerous illness") were adapted for use among nurses in Lusaka, Zambia. Effects of the back pain campaign on back beliefs and participant activation for self-management of back pain among nurses in Lusaka, Zambia, showed no significant differences, even though positive trends were observed in many outcomes such as the participant activation measures, where positive trends were recorded in all the 11 items when more people agreed with the statements after the campaign (Study 3). Positive trends were also observed in participants' coping strategies, use of pain medication, frequency of doctor visits and number of sick-leave days.

Conclusion: The back campaign had an influence on the attitudes towards back care goals albeit, not significant, and promoting healthy behaviours. In addition, the campaign demonstrated an effective approach that could decongest the healthcare system and minimise healthcare costs because of the reductions in the number of sick-leave days, frequency of doctor visits and use of pain medication during back pain experiences.

Recommendation: The back pain campaign was an effective strategy to advance self-management of back pain in the nursing profession. Their work-setting is also a good arena for implementing practical strategies aimed at promoting health and minimising the effects of back pain experiences.

OPSOMMING

Agtergrond: Die prevalensie van rugpyn onder verpleegkundiges is wêreldwyd hoog en wissel tussen 55% en 84%. In Afrika wissel die prevalensie van rugpyn in verskillende studies onder verpleegkundiges tussen 33% en 73.5%. In Zambië is die algemene voorkoms van rugpyn onder verpleegkundiges 58.3%. Verpleegkundiges word blootgestel aan arbeidsintensiewe, herhalende take wat dikwels in stresvolle liggaamsposture uitgevoer word. Die hoë voorkoms van rugpyn onder verpleegkundiges is 'n groot bron van kommer omdat dit werksdoeltreffendheid verminder en die veiligheid van pasiënte asook gesondheidsuitkomste beïnvloed.

Doel: Die oorkoepelende doel van hierdie studie was om 'n kruiskultureel-gevalideerde rugpynveldtog vir verpleegkundiges in Lusaka, Zambië, te ontwerp, en die effektiwiteit daarvan te assesseer, in terme van rugpyn-oortuigings, hanteringstrategieë en deelname-aktivering.

Navorsingsopset: Die navorsing is uitgevoer in Lusaka in die Chawama, Chingwere, Chilenje, Chelstone en Kayama eerstevlak-hospitale. Die hospitale bied verskillende gesondheidsdienste en openbare gesondheidsprogramme op gemeenskapsvlak. Die hospitale is doelgerig as studiegebiede gekies vanweë die groot aantal verpleegkundiges wat by die sentrums werk en die soortgelyke bedryfsvlakke en stelsels vergeleke met die ander sentrums.

Metodologie: Drie studies, met verskillende metodologieë gebaseer op die beginsel van bewysgesteunde praktyk (BGP), is uitgevoer as volg:

Studie 1: ’n Sistematiese oorsig van selfbestuur-opvoedingsveldtogte oor rugpyn, met die doel om gepubliseerde navorsing oor die inhoud, modus en duur van lae rugpyn (LRP)-veldtogte op te spoor en te sintetiseer, en om die uitkomste en doeltreffendheid van die veldtogte te beskryf.

Studie 2: Kruiskulturele validering en formulering van sleutel-bewysgesteunde rugpynboodskappe vir verpleegkundiges in Zambië. Die doel was om vas te stel watter plaaslike kontekstuele faktore die begrip, uitvoerbaarheid en opname van bewysgesteunde boodskappe wat in gepubliseerde veldtogte gerapporteer is, kan beïnvloed. Daarbenewens het hierdie studie ook ten doel gehad om die veldtog te ontwerp op grond van die inligting wat in Studie 1 verkry is, en om die inhoud daarvan onder kundiges te valideer.

Studie 3: ’n Voor-na kwasi-eksperimentele studie om die doeltreffendheid van 'n kruiskultureel-gevalideerde rugpynveldtog vir verpleegkundiges in Lusaka, Zambië, te evalueer, met die inagname van deelname-aktivering en rug-oortuigings as sleuteluitkomste.

Resultate: Artikels wat nagegaan is (Studie 1) het rugpynveldtogte wat in die algemene bevolking uitgevoer is, bevat. Daar is gerapporteer dat deelname-aktivering, bewustheid en tevredenheid oor

rugpyn in die algemene bevolking verbeter het as 'n algemene effek van die veldtogte. Boodskappe wat tydens die veldtogte gelewer is, is aangehaal as nuttig om die effekte van pyngestremdheid te verminder en werksuitkomste te verbeter, deur die bevolking se instellings en oortuigings te beïnvloed. Veertien rugpynboodskappe is geïdentifiseer, gesintetiseer (Studie 1) en kruiskultureel gevalideer vir implementering onder verpleegkundiges in Zambië (Studie 2). Al die rugpynboodskappe, behalwe een ("rugpyn word selde deur 'n gevaarlike siekte veroorsaak"), is aangepas vir gebruik onder verpleegkundiges in Lusaka, Zambië. Effekte van die rugpynveldtog op rug-oortuigings en deelnemeraktivering vir die selfbestuur van rugpyn onder verpleegkundiges in Lusaka, Zambië, het geen beduidende verskille getoon nie, alhoewel positiewe tendense waargeneem is in heelwat uitkomste; insluitend die deelnemeraktivering-maatstawwe, waar positiewe tendense waargeneem is in al 11 items wanneer meer mense saamgestem het met die stellings ná die veldtog (Studie 3). Positiewe tendense is ook waargeneem in deelnemers se hanteringstrategieë, gebruik van pynmedikasie, die frekwensie van doktersbesoeke en die aantal siekteverlofdae.

Gevolgtrekking: Die rugpynveldtog het 'n invloed gehad op verpleegkundiges se houdings teenoor rugsorgdoelstellings, hoewel nie betekenisvol nie, en het gesonde gedrag bevorder. Daarbenewens het die veldtog 'n effektiewe benadering getoon wat kongestie van die gesondheidsorgstelsel kan verlig en gesondheidsorgkoste tot 'n minimum kan beperk weens die vermindering in die aantal siekteverlofdae, frekwensie van doktersbesoeke en pynmedikasie-gebruik tydens rugpyn-episodes.

Aanbeveling: Die rugpynveldtog was ’n effektiewe strategie om die selfbestuur van rugpyn in die verpleegsberoep te bevorder. Verpleegkundiges se werksopset is ook 'n goeie arena vir die implementering van praktiese strategieë wat daarop gemik is om gesondheid te bevorder en die gevolge van rugpyn-ervarings tot die minimum te beperk.

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DEFINITION OF TERMS

Back pain:	Any pain between the lower rib margins and the buttock creases which may be accompanied by pain in one or both legs with and without associated neurological symptoms (Maas et al., 2017)
Cross-cultural validation:	Cross-cultural validation refers to whether measures that were originally generated in a single culture are applicable, meaningful, and equivalent in another culture (Huang & Wong, 2014)
Evidence-based practice:	A conscientious, explicit and judicious use of current best evidence in making decisions about the care of individual patients; the integration of best research evidence with clinical expertise and patient values (Eizenberg, 2011; Janković, 2008; Sackett et al., 1996).
Interventions:	An action taken to improve a disorder or condition
Nurse:	A person specifically trained to care for the sick independently or supervised and is skilled in promoting and maintaining health (CSO, 2015)

LIST OF ACRONYMS

AIDS	**:**	Acquired Immuno Deficiency Syndrome
ART	**:**	Anti-retro Viral Therapy
BBQ	**:**	Back Beliefs Questionnaire
CE	**:**	Conceptual Equivalence
CHAZ	**:**	Churches Association of Zambia
COVID-19	**:**	Coronavirus disease
CSO	**:**	Central Statistical Office
EBP	**:**	Evidence-Based Practice
FGDS	**:**	Focus Group Discussions
HICs	**:**	High-income Countries
HIV	**:**	Human Immuno Virus
HREC	**:**	Health Research Ethics Committee
IE	**:**	Item Equivalence
JBI	**:**	Joanna Briggs Institute
LBP	**:**	Low Back Pain
LDHO	**:**	Lusaka District Health Office
LMICs	**:**	Low- and Middle-income Countries
MOD	**:**	Ministry of Defence
MOH	**:**	Ministry of Health
MOHA	**:**	Ministry of Home Affairs
NGT	**:**	Nominal Group Technique
NHRA	**:**	National Health Research Authority
Non-RCTS	**:**	Non-randomised Controlled Trials
PAM	**:**	Participant Activation Measure
PAMQ	**:**	Participant Activation Measure Questionnaire

PICOS	**:**	Participants, Interventions, Comparisons, Outcomes and Study designs
PICOS	**:**	Population, Intervention, Comparison and Outcomes
PRISMA	**:**	Practices for Systematic Reviews
RCTS	**:**	Randomised Controlled Trials
SE	**:**	Semantic Equivalence
SU-HREC	**:**	Stellenbosch University Health Research Ethics Committee
TIDieR	**:**	Template for Intervention Description and Replication
UNZASHREC:		University of Zambia School of Health Sciences Research Ethics Committee

CHAPTER ONE

1.0 Introduction

Back pain is a common complaint and a global health concern in populations worldwide (Hartvigsen et al., 2018; Vos et al., 2012). Approximately 149 million workdays at a cost of US$100-200 billion are lost annually due to back pain (Vos et al., 2012). Back pain is defined by the location of pain, typically between the upper rib margins and the buttock creases and may be accompanied by pain in one or both legs with and without associated neurological symptoms (Maas et al., 2017; Dionne et al., 2008). Lifestyle factors, like smoking, obesity, and low levels of physical activity, are also associated with the occurrence of back pain (Hartvigsen et al., 2018; Buchbinder et al., 2018). Further, the number of years that people have lived with disability caused by back pain, has increased by more than 50% since 1990, especially in low-income and middle-income countries (LMICs) because of overburdened workers and poor access to quality healthcare (Hartvigsen et al., 2018; Maas et al., 2017).

Back pain is most prevalent and burdensome in working populations and is associated with increased activity limitation (Buchbinder et al., 2018; Maas et al., 2017; Vos et al., 2012). The global point prevalence of activity-limiting back pain is 73% (Hartvigsen et al., 2018). Lifting and repeated activities in occupations such as nursing increase the risk of developing back pain especially in LMICs where possibilities for job modification are limited (Hartvigsen et al., 2018; Maas et al., 2017; Vos et al., 2012; Hoy et al., 2010). The prevalence of back pain in nurses globally is high and ranges from 55-84% (Yan et al., 2017; Freimann et al., 2015; Chung et al., 2013; Jaromi et al., 2012; Soon-Lea & Jong-Eun, 2010). In Africa, the prevalence of back pain reported in different studies among nurses ranges from 33%-73.5% (Johnson & Emmanuel 2016; Munabi et al., 2014; Sikiru & Hanifa 2010; Tinubu et al. 2010). While, in Zambia the reported prevalence for back pain among nurses is 58.3% (Nkhata et al., 2015). Nurses are exposed to labour intensive, repetitive tasks which are often performed in awkward postures (Yan et al., 2017; Yassi, 2015; Chung et al., 2013). The high occurrence of back pain in nurses is a major concern because it is believed to be a primary cause for decreased working efficiency that affects the safety of the patients and their healthcare outcomes.

Several strategies have been used to manage back pain in nursing, including ergonomic training and education, environmental engineering and redesigning, use of devices or equipment and

exercise therapy or physiotherapy (Friemann et al., 2015; Jaromi et al., 2012; Soon-Lae & Jong-Eun, 2010). However, in Africa there is limited data on what has been done to minimise the effects of back pain among nurses. As the aetiology of back pain is multifactorial in nurses, a combination of optimal clinical, rehabilitation and environmental interventions are said to be more effective than single elements (Soon-Lea & Jong-Eun, 2010). Engineering controls and equipment are a preferred solution and the best line of defence as they create permanent changes that eliminate risks at the identified source (Druley, 2018; Trinkoff et al., 2003). However, these significantly depend on availability, maintenance, and enough space (Druley, 2018; Trinkoff et al., 2003). These recommendations are based on trials from high-income countries (HICs), with limited data on cost-effectiveness (Forster et al., 2018). It is important to note that a substantial gap in evidence and practice between HICs and low- and middle-income countries (LMICs) exists (Scott, Moga & Harstall, 2010). Hence, most recommendations may not be practical for LMICs because they are expensive, and the environmental setup does not have provision or space for installations of engineering controls such as hoists. There is a need to identify cost-effective and context-specific strategies for managing back pain to mitigate the consequences and burden in the nursing population (Hartvigsen et al., 2018; Scott, Moga & Harstall, 2010).

While clinical practice guidelines for the management of back pain support the provision of advice for self-management or self-coping, attitudes and beliefs towards back pain have shown to influence the health-seeking behaviour in affected individuals (Gross et al., 2010; Buchbinder et al., 2008; Werner et al., 2007; Waddell et al., 2007). Evidence suggests that effective programmes to change individual health behaviour require a multifaceted approach that help people adopt, change, and maintain behaviour (Traeger et al., 2019; Gatchel et al., 2016; Turk & Wilson, 2010). Likewise, maintaining a behaviour over time requires different strategies. Media campaigns about back pain are another way of changing beliefs at the societal level through dispersion of evidence-based health information (Buchbinder et al., 2018) Evidence-based guidelines (Stochkendahl et al., 2018; Qaseem et al., 2017; NICE, 2016; Michaleff et al., 2014) recommend early management and use of biopsychosocial approaches which emphasise self-management, psychological and physical therapies. Pharmacological and surgical treatments are less emphasised in preference to active approaches such as back campaigns that promote self-management and functional improvement (Buchbinder et al., 2018; Forster et al., 2018; NICE, 2016; Hoy et al., 2010). The latter show remarkable success in shifting back pain beliefs, decline in worker compensation

claims and reduced healthcare utilisation due to back pain (Forster et al., 2018; Hoy et al., 2010; Werner et al., 2008; Waddell et al., 2007). These media campaigns are seemingly a promising method for managing back pain in Africa where the projected increase in back pain disability has a negative impact on the societal, economical, and public health effects.

1.2 SIGNIFICANCE OF THE STUDY

Back campaigns address pain coping strategies and biomedical factors using simple evidence-based messages. (Buchbinder et al., 2018; Forster et al., 2018; Hoy et al., 2010) propose that back pain is not a severe problem, that disability from back pain can be improved and prevented by positive attitudes and that there is a lot that one could do to help oneself (Buchbinder et al., 2008; Buchbinder & Jolley, 2004). Notably, these campaigns have not yet been conducted in LMICs or the nursing population but have been done in HICs among the general population with remarkable success in shifting back pain beliefs, decline in worker compensation claims, and reduced healthcare utilisation due to back pain (Forster et al., 2018; Hoy et al., 2010). As a result, recommendations have been made for these campaigns to be contextualised and conducted in specific populations (Buchbinder et al., 2018; Forster et al., 2018; Hoy et al., 2010). Tailor-made campaigns promise to be an effective and affordable strategy in mitigating the effects and burden of back pain (Forster et al., 2018; NICE, 2016). This study, therefore, focused on addressing the burden of back pain in the nursing population in Zambia through the process of adaptation and cross-cultural validation of the back-campaign messages. Further, effective, context-specific, and affordable approaches were undertaken because this was a resource-constrained and limited setting. Importantly, although this study was specific to the Zambian context, the research contributes to the international body of knowledge, as it gives insight into the process of contextualising research evidence and appropriateness of international research in resource-constrained settings.

1.3 OVERALL AIM OF THE STUDY

The overall aim of this study was to design and assess the effects of a cross-culturally validated back pain campaign on back beliefs, coping strategies and participant activation for nurses in Lusaka, Zambia.

1.3.1 Specific objectives based on the study phases

The set objectives based on the study phases are presented below:

Study 1: A systematic review on self-management education campaigns for back pain

- To retrieve and synthesize the contents of back pain campaigns
- To describe the outcomes and effectiveness of the campaigns

Study 2

Part a: Nurses' perspectives about context-specific job factors and coping strategies for back pain experiences among nurses in Lusaka, Zambia: A qualitative study

- To explore the perspectives of nurses on back pain experience
- To determine nurses perceived context-specific job factors and coping strategies for back pain experience.

Part b: Cross-cultural validation and formulation of key evidence-based back pain messages for Zambian nurses

- To cross-culturally validate key evidence-based back pain messages identified and synthesized from study one
- Formulate back pain messages for nurses in Zambia

Part c: Selecting priority back pain messages and intervention design

- To obtain agreement on adapted and adopted key back pain messages based on the cross-cultural validation in chapter 4
- To select five key messages for nurses in Zambia to be included in the back pain campaign using the nominal group technique (NGT) design.
- To describe the procedures followed to ensure a collaborative approach in the design of the intervention

Study 3: The effects of a cross-culturally validated back pain campaign on back beliefs, coping strategies and participant activation for nurses in Lusaka, Zambia.

- To assess the effect of the back campaign on:
    - Back pain beliefs
    - Participant activation for self-management of back pain

- Coping strategies
- Sick leave and frequency for doctor visits

1.4 RESEARCH SETTING

The research was conducted in Lusaka, the capital and largest city of Zambia. As a national capital, Lusaka is a commercial centre as well as the centre of government and seats the legislative, executive, and judicial branches of government. The population of Lusaka is approximately 1.7 million and the population density stands at 44. 285.7 per square kilometre (CSO, 2018). Zambia's health service delivery is organised in a referral system (Figure 1) which comprises the first level (district, health posts, health centres), second level (provincial/general centres) and third level (tertiary centres) (MOH, 2012). The main providers of healthcare services are public facilities under the Ministry of Health (MOH), the Ministry of Defence (MOD), the Ministry of Home Affairs (MOHA) and the Churches Health Association of Zambia (CHAZ,) a faith-based umbrella organisation which works in collaboration with the government (CSO, 2018; MOH, 2012). Other providers in the system include private for-profit clinics, drug stores, diagnostic centres, and hospitals. At the first level (district hospitals), primary healthcare and preventive health including vital promotional healthcare services are provided (CSO, 2018). Second level (general hospitals) receive cases deemed complex at first level; providing curative care with services in internal medicine, general surgery, paediatrics, obstetrics, and gynaecology, dental, physiotherapy, psychiatry, and intensive care (MOH, 2012). Finally, the tertiary level is at the apex of the Zambian healthcare system, in which tertiary hospitals serve as referrals for all complex cases which require specialised medical equipment and personnel. Lusaka has centres operating at the three levels and was purposefully chosen for this study because of the substantial number of nurses working in the city and the presence of pivotal institutions such as the ministry of health (MOH) within Lusaka. In addition, the city was easily accessible and economically manageable for the researcher.

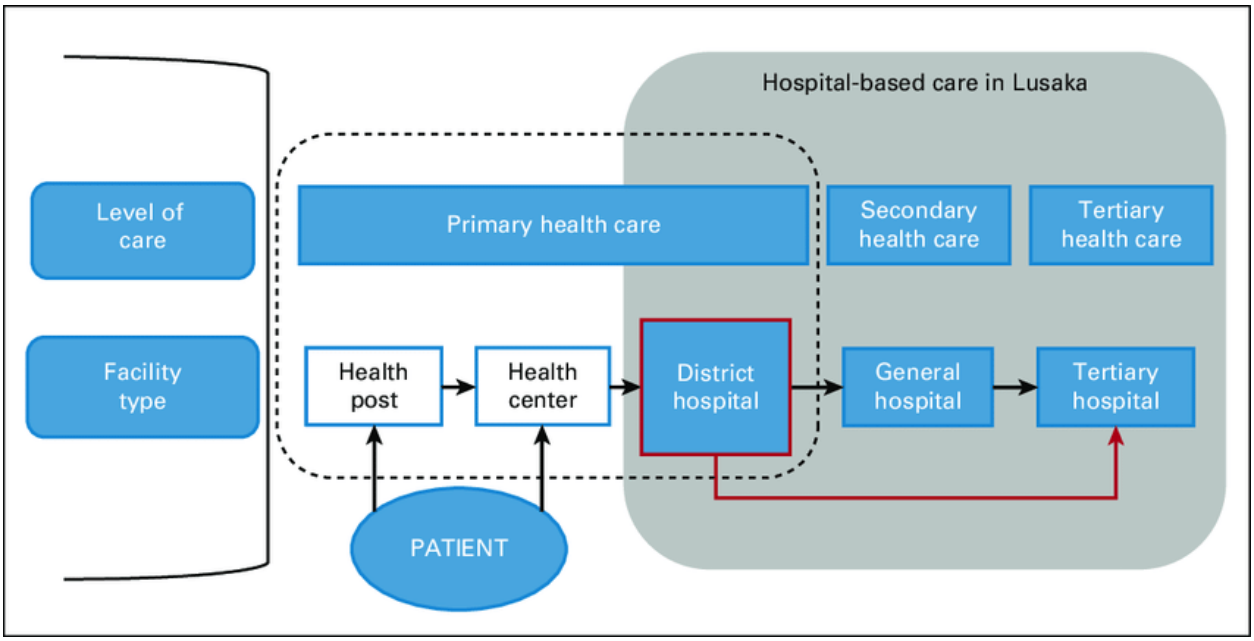

Figure 1: Zambia's health service delivery referral system

1.5 OVERVIEW OF METHODS

Three (3) studies, with different methodologies based on the principle of evidence-based practice, (EBP) were conducted in this study. Evidence-based practice (EBP) is a conscientious explicit and judicious use of current best evidence in making decisions about the care of individual patients, the integration of best research evidence with clinical expertise and patient values (Eizenberg, 2011; Janković, 2008; Sackett et al., 1996). In study 1, a systematic review on self-management education campaigns on back pain was conducted to retrieve and synthesise the content evidence-based back pain messages, mode and duration of published evidence-based back pain campaigns and to describe the outcomes and the effectiveness of the campaigns. In study 2, cross-cultural formulation of key evidence-based back pain messages that were extracted in study 1 were done for nurses in Zambia. This was to ascertain which local contextual factors could influence the understanding, feasibility and uptake of evidence-based messages reported in published campaigns. In addition, the campaign was designed based on the information obtained in the first two studies, and content validity experts were determined. In study 3, a pre-post quasi-experimental study to evaluate the effects of a cross-culturally validated back pain campaign on back beliefs, coping strategies and participant activation for nurses in Lusaka, Zambia was done.

1.5.1 Ethics

Ethical approval and clearance for this study was obtained for the project entitled "The effectiveness of a contextualised back pain campaign for nurses in Lusaka, Zambia," from Stellenbosch University Health Research Ethics Committee (Reference #: S18/06/125s; Project ID:7431); the University of Zambia Health Sciences Research Ethics Committee (Protocol ID: 20181016002), the National Health Research Authority, the Lusaka District Health Office and the participating health centres.

1.6 STRUCTURE OF THE THESIS

Figure 2 provides a schematic flow diagram of the research process. The general introduction (Chapter 1) is given followed by a published systematic review (Chapter 2). Subsequently, the three-phased study methodology, is presented: In chapter 3 another peer-reviewed publication on nurses' perspectives about context-specific job factors and coping strategies for back pain experiences in Lusaka, Zambia, is presented. This is followed by chapters 4-6 which highlight the cross-cultural validation, formulation of back pain messages for nurses in Zambia and intervention design. The discussion, study limitations and recommendations are then presented in chapter 7 and the conclusion is presented in chapter 8.

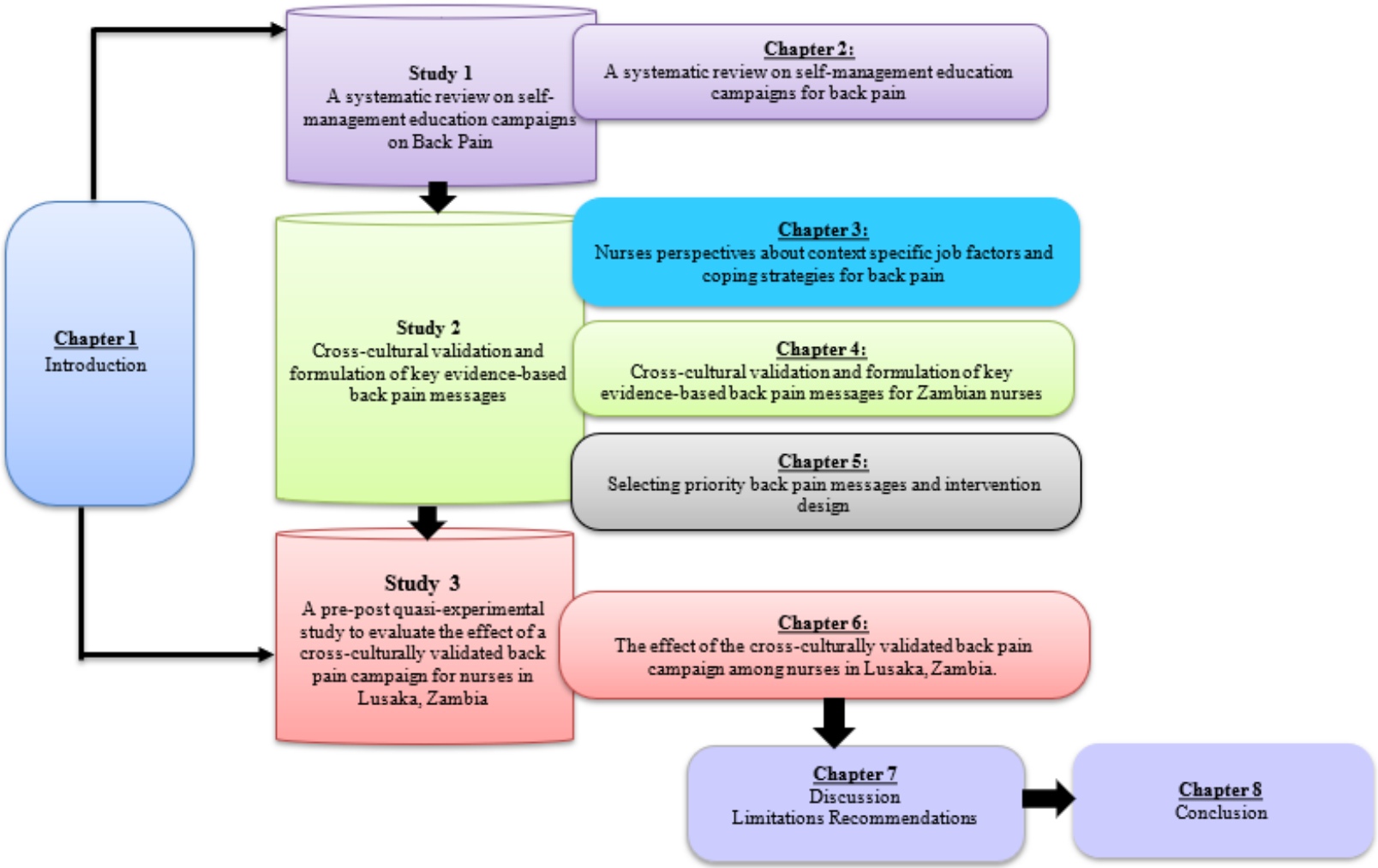

Figure 2: Schematic flow diagram of the research process

1.6.1 The context, evidence sourcing and synthesis

The first part of the dissertation introduces back pain as a common symptom and a global health concern in populations worldwide. In chapter 2 a systematic review of randomised and non-randomised studies presents evidence of back pain media campaigns. This review synthesised the content of evidence-based back pain messages, the mode and duration of published evidence-based back pain campaigns, the outcomes and the effectiveness of the campaigns which informed the cross-cultural validation process in study 2, and the development of the back pain campaign that was used in study 3.

1.6.2 Cross-cultural validation of evidence-based back pain messages

The second part of the dissertation contains the cross-cultural validation and formulation of key evidence-based back pain messages which was achieved using qualitative research methodology highlighted in chapter 4. In chapter 3 the nurses' perspectives about context-specific job factors and coping strategies for back pain are presented. The insights together with information from the first part informs the cross-cultural validation process and formulation of key evidence-based back pain messages presented in chapter 5.

1.6.3 Implementation and evaluation of the effects of the cross-culturally validated back pain messages

The main pre-post quasi-experimental study which evaluated the effects of the cross-culturally validated back pain campaign resulting from insights gained from the first and second parts, is highlighted in the third part of the dissertation. The procedures and outcomes of the back-campaign field activities is described in chapters 4 and 5.

CHAPTER TWO

A systematic review on self-management education campaigns for back pain

This chapter is part of study 1 (Figure 3) and presents the works that has been published **in the South African Journal of physiotherapy** (13 August 2019). A copy of the published paper, as well as the information on the journal it was published in, is available as Appendix (P).

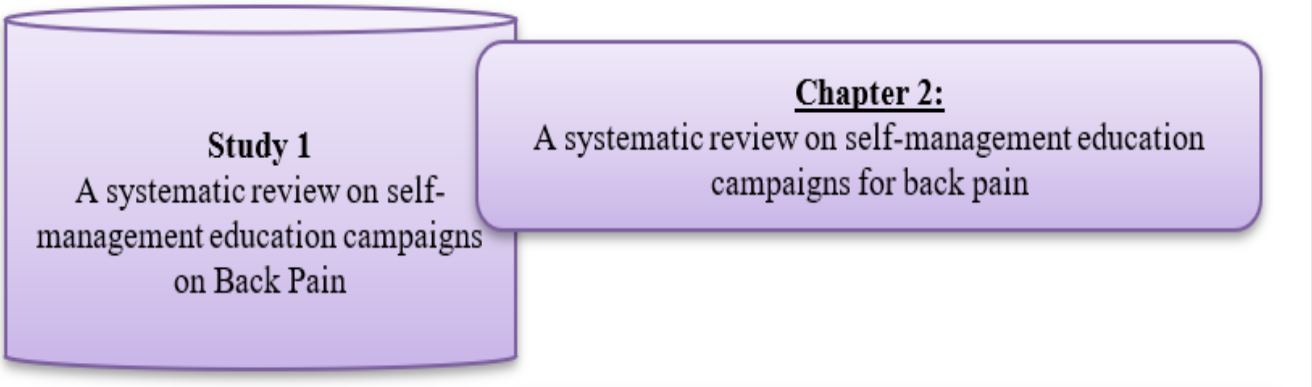

Figure 3: Schematic layout of the structure of chapter 2 in the dissertation

2.0 INTRODUCTION

Back pain is a global health challenge and a leading common condition that causes disability and affects especially the working population worldwide (Forster et al., 2018; Hartvigsen et al., 2018; Hoy et al., 2010). Globally, approximately 149 million workdays at a cost of US$100-200 billion are lost annually due to back pain (Vos et al., 2012). Even though most episodes of back pain recover within a few weeks, most individuals seek care from health institutions, resulting in an economic burden for both the healthcare systems and the affected individuals (Forster et al., 2018; Hartvigsen et al., 2018; Morris et al., 2018; Montegomery et al., 2017; Hoy et al., 2010). Several strategies such as ergonomic training, environmental engineering, use of devices or equipment and exercise therapy or physiotherapy are used to manage back pain because the aetiology is multifactorial (Friemann et al., 2015; Jaromi et al., 2012; Soon-Lae & Jong-Eun, 2010). Nonetheless, evidence-based clinical practice guidelines (Stochkendahl et al., 2018; Qaseem et al., 2017; NICE, 2016; Michaleff et al., 2014) on back pain recommend early management and use of biopsychosocial active approaches such as back pain media campaigns that promote self-

management and functional improvement (Buchbinder et al., 2018; Forster et al., 2018; NICE, 2016; Hoy et al., 2010). Media campaigns are a health strategy used to deliver health messages to the community (Buchbinder et al., 2008). Additionally, they influence population attitudes, beliefs and help to change health risk behaviours (Buchbinder et al., 2008). In healthcare back pain media campaigns address pain coping strategies and biomedical factors using simple evidence-based messages (Buchbinder et al., 2018; Forster et al., 2018; Hoy et al., 2010) including that back pain is not a severe problem, that disability from back pain can be improved and prevented by positive attitudes, and that there is a lot that one could do to help self (Buchbinder et al., 2008; Buchbinder & Jolley, 2004). Notably, these campaigns have not yet been conducted in lower- and middle-income countries (LMICs) but have been done in high-income countries (HICs) among the general population, with remarkable success in shifting back pain beliefs, decline in worker compensation claims and reduced healthcare utilisation due to back pain (Forster et al., 2018; Hoy et al., 2010; Werner et al., 2008; Waddell et al., 2007). As a result, recommendations have been made for these campaigns to be contextualised and conducted in specific populations (Buchbinder et al., 2018; Forster et al., 2018; Hoy et al., 2010). This is because customised campaigns promise to be an effective and affordable strategy in mitigating the effects and burden of back pain (Forster et al., 2018; NICE, 2016). These campaigns seemingly are a promising method for promoting back care in Africa and other developing regions where the projected increase in back pain disability has a negative impact on the societal, economical, and public health aspects.

2.1 METHODOLOGY

This review is part of Project ID:7431 the effectiveness of a contextualised back pain campaign for nurses in Lusaka, Zambia. Ethical clearance was obtained from the Stellenbosch University Health Research Ethics Committee (HREC) Reference #: S18/06/125s. The standard practices for systematic reviews (PRISMA) guidelines were used in defining the participants, interventions, comparisons, outcomes, and study designs (PICOS).

2.1.1 Eligibility criteria

Intervention studies such as randomised controlled trials (RCTs), quasi-experimental case-control, crossover trials and observational studies published in English were considered for this review. The population of interest was the public and the intervention was back pain educational

campaigns. Comparisons such as controls not exposed to the intervention was also considered and outcomes included process and measures such as pain, participant activation measure, number of sick-leave days, back beliefs measure, frequency of doctor visits and frequency and amount of pain relief medication.

2.1.2 Information sources and search strategy

Using the MEDLINE search strategy, the Cochrane Occupational Safety and Health database, MEDLINE, EMBASE, SCOPUS, Physiotherapy Evidence Database (PEDro), the National Institute for Occupational Safety and Health (NIOSH) database and the International Occupational Safety and Health Information Centre were searched. The search was conducted between October 2017 and March 2018 and it included articles from 1990-2018. The search terms included; 'educational', 'interventions', 'campaigns', 'treatment', 'self-management', 'musculoskeletal pain', 'back pain', 'BP', 'low back', 'lower back', 'LBP', 'pain', 'injuries', 'management', and 'nurse', 'nurses' and 'nursing'. The authors obtained and screened titles, abstracts and citations identified by the searches and then retrieved full-text articles independently to identify eligible studies published in English for independent selection. Additionally, hand searching of relevant journals, bibliographic databases, dissertations, and direct communication with authors of included studies" was done. Other resources were reference lists of relevant articles and registers of clinical trials including the WHO International Clinical Trials Registry Platform.

2.1.3 Data extraction and analysis

Authors independently performed data extraction on contents of back pain campaign messages from selected articles taking into consideration checks for discrepancies and processing which were resolved by consensus (Higgins & Green, 2011). Contents which were retrieved included study method, objectives, participants, intervention type, outcome measures, results, references, intervention messages, mode of transmission, and duration. The results from the articles were presented descriptively because of heterogeneity.

2.1.4 Methodological appraisal and assessment of risk of bias

Appraisal of the methodology for RCTs was done using the PEDro scale (Verhagen et al., 1998) which assesses external validity (criterion 1), internal validity (criteria 2–8) and statistical accuracy (criteria 9–10). In addition, the scale contains 11 items, scored as YES/NO, which is either present (1) or absent (0). Non-RCTs were assessed using the JBI appraisal (Tafanaru et al., 2015) which has items that are scored as YES/NO. For risk of bias, the Cochrane risk of bias in non-randomised studies-of interventions (ROBINS-I) tool was used (Thomson et al., 2018; Sterne et al., 2016; Higgins et al., 2016). This tool focuses on assessing internal validity using seven specific bias domains which include: confounding, selection of participants, classification of interventions, missing data, measurements of outcomes, and selection of reported results (Thomson et al., 2018; Sterne et al., 2016). In addition, it contains question items measured on a Likert scale of yes for minimal risk of bias, probably yes, probably no and no for elevated risk of bias (Thomson et al., 2018; Sterne et al., 2016; Higgins et al., 2016). These include the questions: is there potential for confounding of the effect of intervention in this study?; was selection of participants into the study based on participant characteristics observed after the start of intervention?; were intervention groups clearly defined?; were there deviations from the intended intervention beyond what would be expected in usual practice?; were outcome data available for all, or nearly all, participants?; could the outcome measure have been influenced by knowledge of the intervention received?; and is the reported effect estimate likely to be selected, based on the results, from multiple outcome measurements, analyses of the intervention or different subgroups?

2.2 RESULTS

2.2.1 Description of studies

Following electronic searching, 17 potentially relevant articles were identified. Titles, keywords, and abstracts of these articles were assessed, and 11 eligible articles were selected, and the publications obtained. From the 11 eligible articles, five studies were included in the review. Figure 4 illustrates the article selection process.

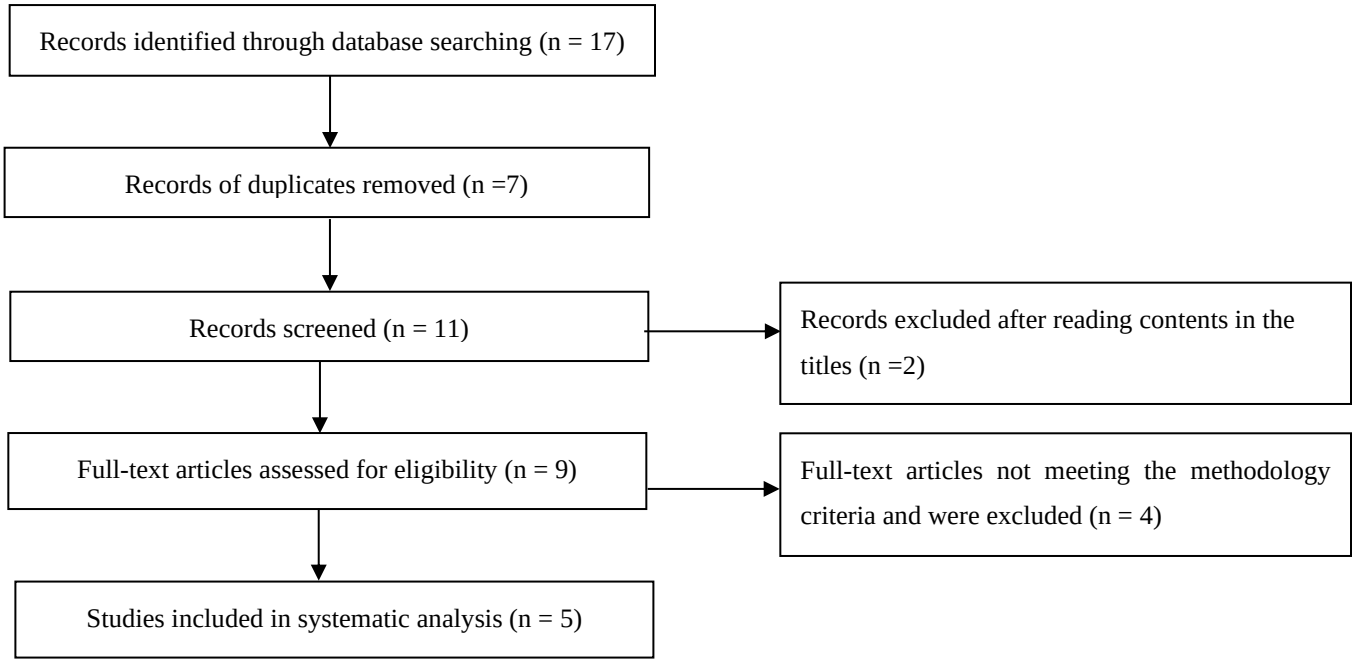

Figure 4: Article selection process using the PRISMA flow chart

2.2.2 Methodological appraisal

Appraisal of the methodology for Suman and others (2017) was done using the PEDro scale (Verhagen et al., 1998) and a score of 6/11 was obtained. For the remaining four articles (Gross et al., 2010; Buchbinder et al., 2008; Werner et al., 2007; Waddell et al., 2007) the JBI appraisal (Tafanaru et al., 2015) was used and items were scored as YES/NO, which is either present (1) or absent (0). The overall score for the four articles was 8/11, details on the appraisal scores for included studies are shown in tables 1 and 2.

Table 1: Evidence grading scores according to physiotherapy evidence database criteria

Author	Item1	Item2	Item3	Item4	Item5	Item6	Item7	Item8	Item9	Item10	Item11	Score
Suman et al., (2017)	Y	UC	UC	Y	UC	UC	UC	Y	Y	Y	Y	6/11

Options for signalling questions: Yes (Y) No (N) Unclear (UC) Not applicable (NA)

1. Eligibility criteria were specified
2. Participants were randomly allocated to groups (in a crossover study, subjects were randomly allocated in order in which treatments were received.
3. Allocation was concealed
4. The groups were similar at baseline regarding the most important prognostic indicators.
5. There was a blinding of all participants.
6. There was a blinding of all therapists who administered the therapy
7. There was blinding of all assessors who measured at least one key outcome
8. Measures of at least one key outcome were obtained from more than 85% of the participants initially allocated to groups
9. All participants for outcome measures were available and received the treatment or control condition as allocated or, where this was not the case, data for at least one key outcome were analysed by 'intention to treat'
10. The results of between-group statistical comparisons are reported for at least one key outcome
11. The study provides both point measures and measures of variability for at least one key outcome

Table 2: Evidence appraisal according to the JBI appraisal checklist for quasi-experimental studies

Author	Item 1	Item 2	Item 3	Item 4	Item 5	Item 6	Item 7	Item 8	Item 9	Score	Overall Appraisal
Gross et al., (2010)	**Y**	**N**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**8/9**	**Included**
Buchbinder et al., (2008)	**Y**	**N**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**8/9**	**Included**
Waddell et al., (2007)	**Y**	**N**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**8/9**	**Included**
Werner et al., (2007)	**Y**	**N**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**8/9**	**Included**

Options for signalling questions: Yes (Y) No (N) Unclear (UC) Not applicable (NA)

1. Is it clear in the study what is the cause' and what is the effect' (i.e. there is no confusion about which variable comes first)?
2. Were the participants included in any comparisons similar?
3. Were the participants included in any comparisons receiving similar treatment/care, other than the exposure or intervention of interest?
4. Was there a control group?
5. Were there multiple measurements of the outcome both pre and post the intervention/exposure?
6. Was follow up complete and if not, were differences between groups in terms of their follow up adequately described and analysed?
7. Were the outcomes of participants included in any comparisons measured in the same way?
8. Were outcomes measured in a reliable way?
9. Was appropriate statistical analysis used?

2.4 DISCUSSION

This review reports on community-based, mass media back pain campaigns. The campaigns included in this review aimed to address misconceptions such the need for rest and activity avoidance when experiencing back pain (Deneen et al., 2017). The campaigns reviewed included messages about physical, psychological, educational, and work-related information to address pain, disability and work outcomes (Werner et al., 2007; Buchbinder et al., 2018). The campaign messages were aimed at promoting positive beliefs on back pain, encouraging self-coping strategies and functional activity. The purpose of the campaign messages was to encourage self-care and ownership of healthcare in individuals suffering from back pain.

Four campaigns which assessed the effectiveness of the "stay as active as possible" message reported a statistically significant positive change. These findings imply that significantly more people were aware that they need to stay as active as possible if they have low back pain and that rest (especially bedrest) is not indicated. This is because rest slows down the natural progress of low back pain and influences work absenteeism (Hartvigsen et al., 2018). The increased awareness to stay as active as possible is therefore an important finding as it has spin-off effects on the prognosis and recovery period as well as financial implications at personal, institutional and national levels, as low back pain is one of the most common reasons for absenteeism (Buchbinder et al., 2018). Although this outcome was self-reported, a proxy measure to support behaviour change in the intervention groups could be reduced sick-leave days or claims. Two of the campaigns (Werner et al., 2007; Buchbinder et al., 2001) indicated a reduction in sick leave and claims after the campaigns. These campaigns were conducted in high-income countries, but this message could be critical for low- and middle-income countries where the belief to rest while having low back pain may be even be widespread among the general population.

Healthcare utilisation also reduced in the four campaigns which measured this outcome (Gross et al., 2010; Buchbinder et al., 2008; Werner et al., 2007; Waddell et al., 2007). Although this outcome was only statistically significant in the Australian campaign, all other campaigns showed a positive trend with respect to healthcare utilisation. The Australian campaign was more comprehensive than the campaigns in the other countries. For instance, they used prime time (on television and radio) to communicate their key messages. In addition, they included well-known personalities to deliver the campaign messages. However, it appears that even less expensive campaigns (Gross et al., 2010; Werner et al., 2007; Waddell et al., 2007) also had a positive effect

on healthcare utilisation and the messages seem to have had a positive effect on health-seeking behaviours in people who experienced back pain. This is a pertinent finding for low- and middle-income countries which may not have the resources for very expensive campaigns and already have limited healthcare budgets. The message to stay active while experiencing back pain should therefore be considered for planned campaigns in low-resource settings where inefficient healthcare utilisation cannot be afforded.

The reduction in healthcare utilisation due to the back pain campaigns could be amplified by the reduced referral for x-rays shown in the Australia and Scotland campaigns (Buchbinder et al., 2001; Werner et al., 2007) which delivered messages that reduced the focus on spinal abnormalities, and maintained that x-rays rarely showed the reason for back pain. This is also indicated in the Lancet series which highlight that liberal use of imaging does not reduce back pain disability or its long-term consequences. Instead, it triggers additional medical care costs and increases the risk of adverse outcomes, such as absence from work (Hoy et al., 2010). Recovery from back pain is aided by remaining active. Therefore, it is important to align practice with this evidence and especially for low- and middle-income countries where imaging referral rates may still be high among back pain patients.

One of the campaigns also reported on process evaluation (Suman et al., 2017). This campaign indicated that evaluation tested the cost-effectiveness and implementation strategy for the campaign. This suggests that process evaluation should be an important initial step when planning similar campaigns as it will assess the feasibility of recruitment, understanding and validity of the selected outcomes of the campaign. Process evaluation is particularly advisable for lower resource countries and regions where little is known about back pain beliefs, healthcare utilisation for back pain and management of back pain. A process evaluation also enables researchers to assess the feasibility of a campaign including barriers and facilitators before launching a more expensive interventional approach.

The campaigns were administered to the general population and the interventions were clearly defined in all articles. Clearly defined intervention and population groups are helpful for future and similar research activities. Unfortunately, data outcomes for articles included in this review were not entirely comparable. This is because their focus, messages, data analysis and characteristics were differently done. Additionally, there were missing data reports which made comparison and narration of the outcomes very difficult and is also a source of challenge for future

research activities especially for resource constrained areas. The number of papers available on back campaigns is very limited. This to a great extent may have impacted and influenced the findings and interpretations for this review. Similar campaigns are therefore recommended especially in low- and middle-income countries where these campaigns have not yet been done and the challenge of back pain is projected to increase in the next decade (Hoy et al., 2010).

2.2.3 Study sample description

Five full-text reports (Gross et al., 2010; Buchbinder et al., 2008; Werner et al., 2007; Waddell et al., 2007; Suman et al., 2017) on self-management education campaigns of back pain were included in this review (Table 3). Notably, these campaigns were conducted in HICs among the general population in Australia (Buchbinder et al., 2008), Canada (Gross et al., 2010), Norway (Werner et al., 2007), Netherlands (Suman et al., 2017) and Scotland (Waddell et al., 2007). Methodological designs of the studies included quasi-experimental (Gross et al., 2010; Buchbinder et al., 2008; Werner et al., 2007) before and after observational study (Waddell et al., 2007) and a mixed methods step-wedge RCT (Suman et al.,2017).

Table 3: Characteristics of included studies

Author	Campaign	Objective	Study design
Suman et al., (2017)	eHealth media campaign	Evaluated process of a multimedia campaign to improve back beliefs in patients with non-specific LBP	Mixed methods-step-wedge RCT
Gross et al., (2010)	Back @ it	Evaluated a back-pain mass media campaign's impact on population back pain beliefs, work disability, and health utilisation outcomes.	Quasi-experimental
Buchbinder et al., (2008)	Back Pain: Don't Take It Lying Down	Aimed at shifting the responsibility of control onto the individual and promoting self-management.	Quasi-experimental
Waddell et al., (2007)	Working Backs Scotland	Aimed at changing public beliefs about the management of back pain	Before–after observational study
Werner et al., (2007)	Active back project	Evaluated the effect of a media campaign on popular beliefs about LBP and eventual changes in sick leave, imaging examination and surgery	Quasi-experimental

2.2.4 Study interventions content

The back-pain media campaign contents on the intervention messages, mode of transmission and duration for the campaigns are shown in Table 4. Campaign messages were different in the campaigns but a few messages similar in some campaigns such as, “don’t take it lying down” (Gross et al., 2010; Buchbinder et al., 2008) and “stay active” were common in the campaigns (Gross et al., 2010; Buchbinder et al., 2008; Werner et al., 2007; Waddell et al., 2007; Suman et al., 2017). Campaign messages were transmitted using television (Gross et al., 2010; Buchbinder et al., 2008; Werner et al., 2007), radio (Gross et al., 2010; Buchbinder et al., 2008; Waddell et al., 2007), billboards (Gross et al., 2010; Buchbinder et al., 2008; Waddell et al., 2007), workshops (Gross et al., 2010; Buchbinder et al., 2008), celebrities (Buchbinder et al., 2008), newspaper articles (Werner et al., 2007), websites (Gross et al., 2010; Waddell et al., 2007; Suman et al., 2017), and flyers (Gross et al., 2010; Buchbinder et al., 2008; Werner et al., 2007; Waddell et al., 2007; Suman et al., 2017). Duration and follow-up period for four campaigns were three years.

Table 4: Interventions, mode of transmission and duration

Authors	Suman et al., (2017)	Gross et al., (2010)	Buchbinder et al., (2008)	Waddell et al., (2007)	Werner et al., (2007)
Back pain Messages	Stay active, Continuing or returning to work, Coping with BP.	Back pain: don't take it lying down The key to feeling better sooner is to stay active	Back pain is not a serious problem continue usual activities Don't rest for prolonged periods Continue exercising and remain at work if possible Positive attitudes are important, and it is up to you X-rays are not useful Surgery may not be the answer keep employees at work	Stay active Try simple pain relief If you need it, get advice Don't take back pain lying down There's a lot you can do to help yourself The prognosis is usually good	Back pain is rarely caused by dangerous illness, X-ray rarely reveal the cause of back pain A back in motion improves faster, Work with your back, one recovers faster by returning to work as soon as possible, Only a few people with back pain need surgery
Mode of transmission	Website, e-videos and pamphlets	Website, radio, bus adverts, posters, pamphlets, billboard, articles in public/industry news publications and TV public service announcements	TV, radio and printed adverts; outdoor billboards, posters, seminars, workplace visits and publicity articles	Website, radio and printed adverts, billboards, posters, seminars, workplace visits and publicity articles	Website, TV, radio and cinema adverts, posters with the campaign messages at health clinics
Duration	2 years (2010-2012)	3 years (2005–2008)	3 years (1997–1999)	3 years (2000–2003)	3 years (2002–2005)

2.3 ASSESSMENT OF OUTCOMES

2.3.1 Outcomes and overall effect of the campaigns on awareness, participant activation and satisfaction

Outcomes that were measured in the campaigns are summarised in table 5. Significant improvement on back pain beliefs in the general population were observed in the Australia ($F= 7.43$; $P<0.001$), Canada (565% - 63%), Norway (21.2%-22.6%) and Scotland ($P<0.001$) campaigns (Gross et al., 2010; Buchbinder et al., 2008; Werner et al., 2007; Waddell et al., 2007).

However, authors in Canada indicate that although positive outcomes were observed, there was no meaningful statistical significance (p=0.13) on the overall effect of the campaign (Gross et al., 2010).

Table 5: Outcomes and the effectiveness of the campaigns

Author	Campaign Awareness	Population back beliefs & Staying active	Patient satisfaction	Sick leave, Healthcare Utilisation & Imagining use	Medical claims and incidence of claims	Overall effect of campaign
Suman et al., (2017)	Awareness increased with time	Proportions not reported	Satisfaction increased with use	Not reported	Outside study scope	Patient satisfaction increased use of media campaign platform
Gross et al., (2010)	49.2% (Treatment) 38.8% (Controls)	Back beliefs 56% - 63% (P = 0.13) Staying active P = 0.008	Outside study scope	Healthcare utilisation reduced	13% reduction	Proportion of subjects agreeing to stay active increased from 56% to 63% (P = 0.008). But no statistically significant effects were seen sick leave outcomes.
Waddell et al., (2007)	60%	(P < 0.001) significant reversal in back beliefs	Outside study scope	11% Downward trends were observed	Fewer spells days of BP No new awards of social security benefits for back disorders	Significant, shift in public beliefs about staying active, 5.5% to 15.7%, P < 0.001) But no effect on sickness absence, no new awards of social security benefits for back pain
Werner et al., (2007)	29% - 39% p = 0.000	Staying active increased from 21.2% – 22.6%	Outside study scope	13 % reduction on sickness leave days; reduced x-rays use 35% (intervention) 33% (control)	observed increase in surgery rate claims in both intervention and control	Significant shift in LBP beliefs in general population, importance of remaining active and at work. reduced use of x-rays,
Buchbinder et al., (2001)	47% - 86%	Staying active 1.9 CI 1.3-2.5 before to 3.2: CI 2.6-23.9 (F = 7.43; p < 0.001)	Outside study scope	15% (controls) and 20% (intervention) reduced use of x-rays	Claims reduced by 15% p = 0.013	Significant, shift in population LBP beliefs, behaviour and reduction in workers' medical compensation claims.

2.3.2 Back beliefs measure and reported change in back beliefs following the campaigns

The back beliefs questionnaire (Maki et al., 2017) was used to measure back pain beliefs (Buchbinder et al., 2008; Werner et al., 2007; Waddell et al., 2007). Significant improvements 1.9-3.2 [CI 1.3-2.5 to 2.6-23.9] in population back beliefs in Australia were observed and sustained even 3 years after the campaign (Buchbinder et al., 2008). In addition, a satisfactory significant reversal [CI 21.2-22.6] in the balance of back beliefs was reported in Scotland (Waddell et al., 2007), while in Canada it was 56%-63% (Gross et al., 2010).

2.3.3 Health utilisation, back claims and number of sick-leave days following the campaigns

The ability to self-manage and the better use of x-rays was reported (Werner et al., 2007: Buchbinder et al., 2008). Sick-leave days and number of claims for back problems declined over the campaign duration by 5% (Buchbinder et al., 2008). Furthermore, general decline in the number of sickness days and overall reduction 5% p=0.013 in claims was observed (Buchbinder et al., 2008). Additionally, a general downward trend was observed with a 13% reduction in the proportion of back claims and sick duration (Gross et al., 2010). On the other hand, Waddell and others (2007) reported an 11% downward trend in the number of people who stayed off work.

2.3.4 Frequency of doctor visits and pain relief medication use following the campaigns

Buchbinder and colleagues (2008) reported a significant 20%-15% reduction in the frequency of doctor visits related to back pain but remained silent on the use of pain relief medication. Similarly, other campaigns were silent on the frequency of pain-relief medication use and did not report the frequency of doctor visits (Gross et al., 2010; Werner et al., 2007; Waddell et al., 2007; Suman et al., 2017). However, even though no figures were given, Werner and counterparts (2007) highlight that they observed an increase in the number of surgery rates in both intervention and control counties but observed no increase in referrals for imaging examination in the intervention county compared to the control.

2.3.5 Work disability outcomes and effects of advice to stay active following the campaigns

In all the campaigns (Gross et al., 2010; Buchbinder et al., 2008; Werner et al., 2007; Waddell et al., 2007; Suman et al., 2017) participants agreed and supported to stay and remain active regardless of back pain. Further, significant shifts in back pain beliefs about staying active among the general population in Canada ($p=0.001$), Scotland ($p<0.001$) and Australia (OR 1.9-3.3) remained sustained for the duration of the studies (Gross et al., 2010; Buchbinder et al., 2008; Waddell et al., 2007; Suman et al., 2017).

2.5 CONCLUSION

The review findings show that the back-pain campaign message to "stay as active as possible" increased participants' awareness to stay active and positively influenced their health beliefs and healthcare utilisation behaviours. The "stay as active as possible" message is simple and easy to follow which demonstrates that well designed and simple messages have the potential to influence and promote health behaviour change in populations. The back campaigns were conducted in the general population in high-income countries. Nevertheless, there contents and methods are transferable to developing countries and populations frequently affected by back pain. However, their implementation must be tailor-made, and efficient but cost-effective methods still need to be explored. This is because back pain campaigns are seemingly an effective method in promoting back care and changing sickness behaviours and beliefs among affected individuals. Over time, substantial and logical change in back pain beliefs may lead to reduced fear and subsequently better self-coping mechanisms for individuals during back pain episodes.

Clinical implications

Providing information on staying active regardless of back pain to individuals with or without episodes of back pain can contribute to significant changes in sickness behaviours and beliefs during subsequent episodes. In clinical practice this can be an effective way of reducing economic costs of back pain for affected individuals and society.

Declaration by the candidate

Nkhata, L.A., Brink, Y., Ernstzen, D. & Louw, Q.A. 2019. A systematic review on self-management education campaigns for back pain. *The South African Journal of Physiotherapy*, *75*(1):1314. doi:10.4102/sajp. v75i1.1314

Regarding chapter 2, the nature and scope of my contribution was as follows:

Author	Email-address	Nature of contribution Extent of contribution	Percentage (%)	Signature
Loveness A. Nkhata	Lnkhata@yahoo.com	Conceptualisation design, literature search, data extraction and analysis, critical appraisal of all studies, data interpretation and final editing.	80%	
Prof. Quinette A. Louw	qalouw@sun.ac.za	Supervisory role: Research inputs, editorial suggestions, and proofreading.	10%	
Dr Yolandi Brink	ybrink@sun.ac.za	Supervisory role: Critical appraisal of articles, managed the literature searches, analyses of the study and proof reading	5%	
Dr Dawn Ernstzen	dd2@sun.ac.za	Supervisory role: Managed the literature searches, analyses of the study data interpretation and proofreading	5%	

CHAPTER THREE

Nurses' perspectives about context-specific job factors and coping strategies for back pain experiences among nurses in Lusaka, Zambia: A qualitative study

This chapter is part of study 2 (Figure 5) and presents work that has been published in **the international journal of nursing and midwifery** (January-March 2020). A copy of the published paper, as well as the information on the journal it was published in, is available as Appendix (Q).

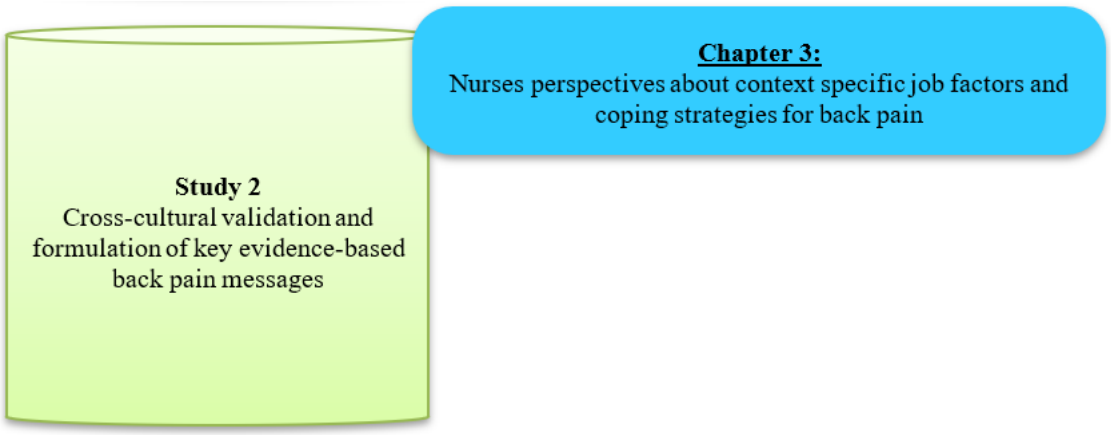

Figure 5: Schematic layout of the structure of chapter 3 in the dissertation

3.0 INTRODUCTION

Back pain is associated with an incremental risk of chronic disease that can lead to a loss of functional health status and a loss in workforce expertise (Alnaami et al., 2019; Abedini et al., 2014). Back pain refers to pain from the upper back to the interior gluteal folds, with or without leg pain (Gim, 2017). In addition, back-pain commonly limits professional activities in the nursing profession (Richardson et al., 2019; Yan et al., 2017). Consequently, nurses with back pain have impaired physical, social, and mental well-being (Abou El-Soud et al., 2014). The prevalence of back pain among nurses ranges between 33% to 84% (Alnaami et al., 2019; Richardson et al., 2019; Yan et al., 2017; Johnson & Emmanuel, 2016; Nkhata et al., 2015). This high occurrence of back pain in nurses is of major concern because it is a key cause for absence at work and a decrease

in working efficiency that exerts economic costs and strain on the health system (Alnaami et al., 2019; Richardson et al., 2019). Direct and indirect costs of back pain in terms of quality of life for nurses are enormous (Yan et al., 2017; Johnson & Emmanuel, 2016; Freimann et al., 2015). The compounded effect of nurses with back pain on the health system and patient outcomes of low resource countries is of great concern as some patients are highly dependent on the nurses, who because of experiencing back pain, may not be able to adequately perform the healthcare activities needed (Gim, 2017).

In most low resource settings, poor ergonomics, and the lack of equipment to perform nursing tasks may be associated with back pain. (Dlungwane, Voce, & Knight., 2018; Johnson & Emmanuel, 2016). Sadly, the burden of back pain in developing countries is exacerbated by low levels of education about back care, low social support, staff shortages, poor working conditions and poor job satisfaction (Dlungwane, Voce, & Knight., 2018). In addition, social, cultural, and economic contextual factors may negatively impact the experience of back pain among nurses. The compounded effect of these factors has an ill effect on the health system, nurses, and patient outcomes.

Nurses form the largest group within a country's healthcare workforce and are central to patient care. Understanding the perceptions of nurses' back pain is important in identifying intervention strategies that may decrease the scale of the problem. Most published reports in low-income countries focused on the prevalence of back pain among nurses (Semachew et al., 2018). However, work-related low back pain among clinical nurses was reported in Tanzania (Mwilila, 2008). Nonetheless, there are inadequate qualitative studies that have explored the lived experiences on context factors for back pain in the work settings among nurses. The perspectives on preventing musculoskeletal disorders in nurses (Richardson et al., 2019) and the nurses' experiences of manual handling in healthcare (Kay, Evans and Glass, 2008) were reported in Australia. Qualitative methods are useful to study the experiences of nurses within the context of their work settings because informants can provide useful information that can enable one to understand their experiences and generate new information that is important in making decisions. There are inadequate qualitative studies on context-specific factors for back pain experiences among nurses, especially in low-income settings (Richardson et., 2019; Kay, Evans & Glass, 2008; Mwilila 2008). Context-specific factors are environmental influences such as experiences that have an impact on the phenomenon under observation (Choice, 2007). The aim of this study was to explore

the perspectives of nurses about their experience of back pain and context-specific job factors and coping strategies. It was believed that understanding the nurses' perspectives on context-specific job factors would develop an evidence base from lived experiences of nurses that would be useful in developing practical and effective back pain intervention approaches to promote health and productivity in the work settings.

3.1 MATERIALS AND METHODS

3.1.1 Study design

This was a qualitative research design, with a phenomenological research approach and interpretive paradigm. This method is useful in gaining insight into and understanding of stakeholder perspectives and their opinions of back pain experiences for nurses in Zambia.

3.1.2 Participants and sampling strategies

To gain greater insight into the matter under study, participants were selected using a maximum variation sampling approach. Inclusion criteria comprised enrolled and registered nurses including nurse practitioners, nursing managers and administrators from a public facility in the peri-urban area of Lusaka. The facility provides various health services to both in and outpatients including public health programmes at community level such as, interventions for common conditions including maternal and child health, HIV and AIDS, tuberculosis, water sanitation and malaria (LDHO, 2017). There are approximately seventy-five nurses working at this facility. To allow identification of common themes amongst a diverse sample the researchers, with the help of the principal nursing officer, identified and recruited registered nurses, enrolled nurses, midwives, public health nurses, nurse managers, and administrators who were available at the time of data collection and who were serving in different departments.

3.1.3 Data collection

A total of three focus group discussions (FGDs) with the aid of a discussion guide, that had semi-structured questions, were used for data collection. The principal investigator (PI) conducted the interviews and an open communication approach was used to ensure that participants communicated their back pain experiences with ease. The interviews were recorded using an electronic audio recorder and transcribed verbatim by professional transcribers. During the

interviews, notes were taken on dynamic emotional aspects such as, reluctance and strong feelings attached to certain opinions or vocabulary used during the FGDs. Sociodemographic and work data was also obtained using a self-administered questionnaire before each FGD. Data verification was done during the FGD by asking participants to further elaborate on information and having participants respond to the summary of their responses.

3.1.4 Data analysis

Data analysis was done using Atlas.ti 8 for windows. Each transcript was analysed line by line to facilitate the capture of emergent themes during data collection. The PI checked the accuracy of the transcriptions by comparing the audio recordings with transcripts The PI and DE independently analysed the transcript from FGD 1, compared codes and created a preliminary code book. Further, analysis involved a process of familiarising with the data; highlighting significant quotes; expanding the codebook; coding the rest of the data; developing clusters of meaning and sorting categories and linkages to establish themes and sub-themes. This process allowed active engagement with the data, and dependability and knowledge were generated using the participants' perspectives grounded in the actual data. Confirmability was enhanced when the same themes emerged from the data of subsequent FGD transcripts. Quotations of text were extracted into separate documents under thematic headings and checked for consistency with the narrative contents which ensured robust representation of the audio and transcript data. Verification of themes and categories was done by the authors after studying and discussing the transcripts. Data saturation was considered when there were no more new emerging ideas or themes from the data.

3.1.5 Ethics

Ethical approval for this study was obtained as part of a bigger project entitled: "The effectiveness of a contextualised back pain campaign for nurses in Lusaka, Zambia" from the Stellenbosch University Health Research Ethics Committee (Reference #: S18/06/125s; Project ID:7431); the University of Zambia Health Sciences Research Ethics Committee, the National Health Research Authority, the Lusaka District Health Office and the participating Health Centre. Written informed consent and permission to record the interviews were also obtained from the participants beforehand.

3.2 RESULTS

3.2.1 Participants' demographic descriptions

Thirty-two (32) out of forty (40) invited participants took part in the FGDs, 68.8% (n=22) were women. The other eight (8) invited participants were on official assignments at the time of interview. The age range was between 20-60 years and the most common age group was 51-60 years at 34% (n=11). All the participants were in full time employment and the majority 75% (n=24) were registered nurses. Thirty-seven percent (37%) of the participants had undergone specialty training in midwifery and were working in the maternity and neonatal wards. Table 6 gives details on the participants' demographic descriptions.

Table 6: Participants' demographic descriptions

Variable	Frequency	Percentage (%)
Gender		
Male	10	31%
Female	22	68.8%
Age at last birthday		
20-30	6	18.8%
31-40	7	21.8%
41-50	7	21.8%
51-60	11	34%
Work status in the last 12 months		
Full Time	32	100%
Part Time		
Work Setting		
General ward	4	12.5%
Medical/Surgical ward		
Maternity and neonatal ward	15	46.9%
ART Clinic	4	12.5%
OPD clinic	8	25%
Qualifications		
Certificate	5	15.6%
Diploma	24	75%
Bachelor's Degree	3	9.4 %
Master's Degree		
Doctorate		
Specialty Training		
Midwifery	12	37%
Theatre nursing		
Critical care nurse		
Paediatric nursing		
Public Health nursing (ART)	5	15.6%
Number of work hours per week		
< 40 hrs.	4	12.5%
40 hrs.	21	65.6%
> 40 hrs.	7	21.8%
Years of professional experience		
5-10	13	40.6%
11-20	5	15.6%
21-30	9	28 %
31-40	5	15.6%

3.2.2 Interview results

The average time for the recorded interviews was 60 minutes. All interviews were conducted in the dental department staff room at the health centre. This was the participants' preferred setting because it was readily available at the time of interviews and within their work premises.

The major themes that emanated from the FGDs are outlined in table 7. These factors are "specific to the context" because they are explicit to these study settings and relate to the information, experiences and incidences as narrated by the participants.

Table 7: Context-specific factors about back pain

Themes	Sub-themes	Categories
Job-related factors	Workload:	▪ Human resource ▪ Patient load ▪ Number of work hours ▪ Mode of performing tasks ➢ Posture ➢ Lifting techniques
	Work environment	▪ Equipment ▪ Furniture ▪ Setting
Coping strategies	Active coping strategies	▪ Lifestyle ➢ Exercise ➢ Diet ➢ Education ▪ Stress management ▪ Physiotherapy rehabilitation
	Passive coping strategies	▪ Rest ▪ Medication

All participants indicated having experienced back pain, sometimes lasting for more than three days in the course of their work routines as nurses.

The section below elaborates on each theme. Verbatim accounts of participants' expressions are presented below, and illustrations of key statements used have been presented without identifiers beyond 'participant', 'ward', and 'FGD' were the quotes emerged from. Table 8 gives details on the identifiers that have been used.

Table 8: Key statements illustrations identifiers

	Identifier	Key statement
1.	'Part'	Participant
2.	'D1'	Focus group discussion 1
3.	'D2'	Focus group discussion 2
4.	'D3'	Focus group discussion 3
5.	'Ward'	Ward
6.	'M'	Male
7.	'F'	Female

3.3 PARTICIPANTS' PERSPECTIVES ABOUT CONTEXT-SPECIFIC FACTORS OF BACK PAIN EXPERIENCES

3.3.1 Job-related factors

Participants' perspectives about their back pain experiences were mostly context-specific job-related factors, with workload and work environment as sub-themes. Workload aspects comprised inadequate human resources, high patient load, high number of work hours and mode of performing tasks. Work environment categories comprised inadequate or inappropriate equipment, furniture and setting.

3.3.2 Workload

Patient load and human resource

Participants regarded high workload, which involved a high patient load on the wards and outpatient department (OPD) clinics and being inadequately staffed, as contributing to their back pain experiences. Participants reported that these demands resulted in exertion because workload on the wards did not allow them enough time to rest. Additionally, the high demands at work influenced the nurses' abilities to pay enough attention to protecting their backs; thereby affecting the quality of service rendered.

"The workload is too much, sometimes there are just too many patients, and maybe only one nurse is taking care of them so, from just doing the nursing of those patients, the back really gets painful." ***Female part; Maternity ward, D1***

"I would like to add on work overload, sometimes you work alone, on the ward and we don't have enough time to rest by the time you are knocking off your back and your feet are paining. The patient nurse ratio, should really be adhered to because nurses are, seeing more patients than they're supposed to." ***Female part; Admission ward, D2***

Working hours

Participants resounded that the number of working hours spent on the wards and in direct patient care were too long especially during night duty and the morning to afternoon (07h30 to 16h00) shift because nurses stand for very long periods. According to the participants, these long hours make their work very stressful resulting in back pain.

"When you are doing night duty, especially in labour ward. We are working for so many hours, no time to rest not even a bit. You start at 6:00 in the evening and you are standing the whole night up to 6:00 in the morning, by the time it's morning, eish, your back it's paining. ***Female part; Maternity ward, D1***

"I have especially when I am doing night duty, we are working for so many hours, no time to rest not even a bit, it's like you go for work, you start at 6:00 pm and you are standing the whole night, by the time it's morning, your back it's paining." ***Female part; Admission ward, D3***

Mode of performing tasks

Participants expressed that the mode in which most nursing tasks were performed such as suturing, giving medication and bed bathing was also strenuous and a part of most back pain experiences because these activities demand that they assume awkward postures such as kneeling to attend to patients who may be laying down on the floor. According to the participants their posture during work, included bending, twisting and lifting which, if unchecked, contributed to their back pain experiences.

The other thing is when we are suturing, we need to sit on a comfortable chair but, we are standing and bending most of the time, the moment you finish you can't even stand up right you can have backache even two or three days." ***Female part; Maternity ward, D1***

"We usually conduct a diverted outreach and we palpate mothers on the ground, so you have to kneel and bend. You go up and about, bending, doing all sorts of things,…then we have a lot of mothers that we are supposed to palpate, so by the end of palpation you have back pain and it lasts for more than three days." ***Female part; Maternity ward, D2***

Participants also echoed that often, because of being inadequately staffed, they were using inappropriate lifting techniques during their work routines. This is because sometimes the wards are very busy and there are no fellow nurses or equipment to assist with the lifting or moving of patients. According to the participants, this makes it very difficult for them to apply lifting techniques because a single nurse must perform the tasks alone.

"The other thing is the lifting techniques and all that exercise. Sometimes we are using the wrong techniques when lifting the patients especially when you are alone you even disregard the proper lifting techniques because you must lift the patient from a wheelchair to a stretcher which is slightly high, or from a bed which is high to a bed which is low." ***Male part; OPD ward, D1***

"… especially in outpatient's department with shortage…poor lifting techniques are used like when lifting the patients from the bed to the stretcher and stretcher to bed. I find that very straining to the muscles ***Male part; OPD ward, D3***

3.3.3 Work environment

Work related equipment

Participants said that basic equipment such as stretchers or trolleys, required to assist in moving patients during their work shifts, was either inadequate or unavailable in their context. Participants expressed that this increased their chances of experiencing back pain because nurses are forced to lift or move patients using their own body strength which posed a great risk for back injuries for them. Participants expressed that access to the right equipment and regular education about lifting techniques could prevent the occurrence of back pain.

"There is certain equipment that we can use for lifting patients, transferring patients, and all that but we don't have at this institution even just basic trolleys, you have to carry a patient from maybe the vitals table to go and see the doctor or to the bed, and all those add towards the back pain." ***Male part; OPD ward, D2***

"I think especially in patients with staff shortage lifting the patients from the bed to the stretcher and stretcher to bed I find that very straining to the muscles because the equipment that we can use for lifting patients, transferring patients, and all is not there." ***Female part; Admission ward D3***

Hospital or health facility furniture

Participants also voiced that most of the furniture that was being used in the workplace was inappropriate for the type of work that they were doing. The specific furniture mentioned was the nurses' workstations regarding chairs and desks that were not ergonomically designed or positioned. Participants mentioned that this made them sit at angles which were very uncomfortable and caused them to experience back pain by the end of the day or a session. Additionally, participants also expressed that the patient's furniture in the wards and clinics were mismatched with the type of nursing activity because they were either too low or too high for them. As a result, this makes them perform most of the nursing tasks using postures that were strenuous and uncomfortable.

"I've noticed that most of our furniture, are not appropriate for the type of work that we are doing. It's either too high or too low, uncomfortable so we don't sit in a position which is comfortable, we tend to sit either at an angle so, by the end of a session, we experience a lot of back pains." ***Female part; Admission ward, D1***

"In the antenatal wards also, the beds are too low and as you are bending to do all the things you can get backache." ***Female part; Maternity ward, D3***

"I have also experienced back pain, but the worst was when I was with a patient just almost to deliver. I don't know whether the bed was slightly low or what, but immediately I tried to move, there was a click on my back and that was it." ***Female part; Maternity ward, D2***

"But then of course the other thing is being able to provide adequate and proper furniture and equipment, or the stuff to use so that we do not experience some of these back aches that come about because of lack of proper equipment." ***Female, part; Maternity ward D3***

Work environment / infrastructure

Participants reported a lack of basic facilities such as suitable tea rooms in their work setting. They compared their resting rooms to those of the doctors and concluded that, in contrast, the nurses had no suitable place to rest, especially during the nightshifts. They expressed that this impacted on and contributed to their back pain, especially because nurses could only sit to rest on the chairs or tables when there was an opportunity to do so. Participants believed that creating a suitable space were nurses could rest would help relieve stress and minimise the effects of back pain.

"When I look at the infrastructure, it's like nurses are not considered to say they should have a moment of resting. Doctors are usually given a room where they can rest, but nurses, hey, uh-uh. It's like nurses should not rest at all." ***Female part; OPD ward, D1***

Hospital infrastructure was also revealed to contribute to stress-related job tasks. Hospital bed space capacity was limited, however, with the dire need for healthcare, some patients are admitted, even beyond capacity. The latter resulted in some patients being given floor beds. Consequently, this made performing nursing tasks and movements within the wards more difficult because of the inadequate space.

"Like in the labour ward, sometimes women come when it's very busy and the beds are full, they deliver on the floor. So, as you are bending to do all the things then you can get backache." ***Female part; Maternity ward, D2***

3.4 COPING STRATEGIES FOR BACK PAIN

Participants' accounts on coping strategies for back pain experiences indicated that individuals employed both active and passive strategies to manage their back pain. Active coping strategies involved taking personal responsibility for pain management, lifestyle activities such as physical exercises, physiotherapy rehabilitation and stress management and attempts to function despite having pain. Passive coping strategies comprised managing pain using an outside source or rest (Carroll et al., 2002), such as utilising pain relief medication.

3.4.1 Lifestyle

Exercise and diet

A subset of participants believed in lifestyle coping activities such as exercise, a healthy weight and diet to manage their back pain. Furthermore, participants expressed that they used a healthy diet and vitamin supplements to build their bodies in order to cope with the demands of the job.

"When I go back home it's when I deal with the consequences of back pain and that's when I start doing stretches, I make sure I do a bit of jumping and jumping because if I don't that day, I will have terrible back pain." ***Female part; Admission ward, D1***

"If it's light, at least you'll be bending, standing up, bending just like that. We are also looking at bones so the diet, we need to take more care…taking calcium supplements, vitamins or fruits in the diet also helps." ***Female part; TB ward, D2***

"Sometimes even the weight we need to check our weight or the type of food we are eating. Usually, if you are heavy honestly you find even if you are doing a simple procedure will be difficult. We need to watch our diet because of obesity… obesity is really an enemy to health." ***Female part; Maternity ward, D3***

Physiotherapy rehabilitation

Some participants revealed that they attended physiotherapy and engaged in rehabilitation exercise activities to manage and minimise the effects of back pain. They expressed that being taught the correct exercise which could be done during work, such as proper stretching, would further help them in coping with back pain.

"I do physiotherapy exercises every day because I noticed that if I don't do physio in the morning, I won't even be able to work. So, I do the exercises that I was taught… but if the pain is too much, I end up seeing the physiotherapist for a few physio sessions so that maybe they massage me a bit, then the pain goes." ***Female part; Maternity ward, D2***

Stress management

Participants in the FGDs mentioned that they were stressed due to work pressure as well as financial stressors which contributed to body and back pains. Participants acknowledged that even

if they knew about stress management and could managed stressed patients, they experienced challenges managing their own stress levels.

"And stress management though we don't know how to manage our stress. We are very good at caring for the patients, but for ourselves, it's not there. You know we are stressed financially, so with stress literally the whole body is aching, but we are not able to manage our bodies adequately." ***Female part; Maternity ward, D3***

3.4.2 Use of pain relief medication and rest

Most participants reported resting and using pain relief medication to cope with back pain. Pain relief medication was the most frequently used coping strategy.

"When you have the back ache, of course what usually happens is you are given pain killers and a sick note to go and rest until you feel better. I feel its part and parcel of the job, it's something that will come and go eventually. So, ... I take a couple of paracetamols or Brufen and continue with work." ***Male part; OPD ward, D2***

"When experiencing the back pain... that back pain won't finish within a day. It will take you for two to three days, it's still there, unless you take a Panadol, then you will feel like it subsides. And because now we are aging Panadol does not even work so, we take something heavier…. you go to an extent of taking Diclofenac." ***Female part; Maternity ward, D3***

"I have experienced back pain and even now I have back pain. When I stand, that's when it's even worse. I took a short leave, I thought when I went on a short leave, I will feel better, but the pain is still there and it's like increasing." ***Female part; Maternity ward, D1***

Notably one participant mentioned having changed work departments to cope with the effects of back pain. However, the participant also expressed that this didn't help much, resulting in the participant opting to use pain relief medication on a regular basis. Another participant explained that apart from use of pain relief medication, she also used an orthopaedic belt to obtain back pain relief.

"I changed, we went to the orthopaedics, yah. I'm still having the same pain, now every night I must take a painkiller." ***Female part; Admission ward, D1***

"I keep on taking, some painkillers … then my belts every day I have to put on belts to help me relief the back pain." ***Female part; Maternity ward, D3***

3.5 DISCUSSION

The nursing profession is an essential component of the healthcare workforce. Back pain experienced by nurses can have a negative impact on personal well-being, patient care and health system efficiency and costs. It is therefore important to identify factors that contribute to their back-pain experiences as this information may play an essential role in developing intervention approaches that could promote well-being (Abedini et al., 2014). This study aimed to explore the perspectives about context-specific factors and coping strategies for back pain experiences among nurses, in Lusaka, Zambia.

This study found that Zambian nurses perceived several work-related contextual factors to be linked to their experience of back pain. The factors are job-related and work environment. Job-related factors include workload influenced by work hours, human resource, and mode of performing tasks. While work environment involves the infrastructure and facility furniture. Aspects of workload which includes reduced human resource, high number of patient load, long working hours and mode of performing tasks were contextual factors that were identified in this study. The number of working hours spent on the wards and in direct patient care were said to be too long especially during night duty. The mode in which most nursing tasks were performed were described as being too strenuous because nursing postures during work, included bending and twisting.

These findings are similar to the reported high demands of nursing work in hospitals in Tanzania (Mwilila, 2008) and the United States of America (Geiger-Brown et al., 2004). In addition, demanding working conditions such as long hours, heavy lifting and low staffing levels exerted a personal toll that reduced quality of life for nurses even during off hours (Geiger-Brown et al., 2004; Mwilila, 2008). High demands, including a wide range of tasks and duties, lack of adequate personnel and lifting heavy objects were also described as problems that increased the probability of experiencing back pain among the nurses in the United Kingdom (Boniface, Ghosh & Robinson, 2016) and Iran (Abedini et al., 2014). Although these outcomes for high-income and low- to middle-income countries are comparable, it is important to note that the work conditions and the

contextual factors of these settings may not be comparable (Semachew et al., 2018). For high-income countries, the actual conditions and standards for nursing work may be better, compared to those of low- to middle-income countries which often operate on limited healthcare budgets and are compounded by a higher disease burden (Boughattas et al., 2017).

Awkward postures assumed during work activities including inappropriate and poor lifting techniques were constantly connected with back pain experiences in our study. This aspect has also been expressed in other studies (Heideri et al., 2019; Mwilila, 2008; Geiger-Brown et al., 2004) and is worsened by lack of equipment and poor work settings. Repetitive postures and movements may be a cause of cumulative pressure to the musculoskeletal system causing back pain among nurses. Nurses routinely perform activities such as lifting and transferring patients in/out of the bed or from the floor. These activities are repetitive, labour intensive and involve direct contact with the patients (Chung et al, 2013). In the current study participants specified assuming awkward postures because the patient beds were either too high or too low for them and sometimes because of high patient turn-out, some patients were nursed on floor beds. This may suggest that even though postural and handling techniques are taught during training, staff shortages and lack of equipment may make it difficult for nurses to practise the techniques effectively.

Nursing physical activities involve movement and patient support which sometimes may have unpredictable consequences due to weight and poor gripping, leading to injuries for the nurse (Alnaami et al., 2019; Heidari et al., 2019). These outcomes suggest that there is a mismatch between job activities performed by nurses to meet work demands and their physical abilities or the need for more advanced technologies and/or equipment to assist with the load. However, some of these job activities may be controlled by the individual nurse and could also be corrected through training although, it may not be the ultimate remedy. Therefore, prevention activities must be directed towards enhancing work practice capacity such as providing educational programmes, raising self-awareness, and encouraging proper physical activity, stretching exercises, instructions, and personal coping strategies in response to back pain experiences (Richardson et al., 2019). The above factors may allow nurses to have personal control of their work situation and subsequently may decrease the occurrence and severity of back pain injuries. Increasing the staffing capacity would not only benefit the nurses' health but would also improve the quality of healthcare services provided to patients.

The working environment with regards to equipment, furniture and settings were also identified as being unavailable, inadequate, or inappropriate for the type of work that nurses do. The lack of basic facilities such as tea rooms where nurses could rest was also seen as a factor that compounded their back-pain experiences. Similar sentiments about work settings, inappropriate furniture and lack of equipment were also expressed as factors for back pain among nurses in Tanzania (Mwilila, 2008). Other studies (Richardson et al., 2019; Abedini et al., 2014) also identified the absence of hospital equipment particularly for lifting and moving obese patients, as increasing the risk of back injury among nurses. These accounts show that the work environment, if not adapted for the routine tasks that nurses perform, may hinder nurses from putting into practice the functional and injury prevention skills they acquired during training. Earlier studies (Richardson et al., 2019; Geiger-Brown et al., 2004) have suggested that problematic work settings faced by nurses could be addressed by redesigning the workplace setting, and by providing lifting equipment and appropriate furniture. This approach is recommended because, if used correctly, it reduces the risk of back injury by minimising the demands on the worker. Although, in low-income settings this may remain unattainable because of budget constraints and the little or no control that nurses have over their work situation.

However, for the optimal health and well-being of nurses, it is essential that their work environment be a key budget consideration to warrant the redesigning of infrastructure and the provision of appropriate equipment and furniture. Modifying equipment or some features of the working system to reduce the risk of back pain injury among the nurses may also be achieved by promoting multiple approaches in the workplace. This would include developing a culture of safety, manual handling training in clinical contexts, making changes in workflow, staffing support to allow teamwork and access to available equipment (Richardson et al., 2019). For low-income settings, these activities are practical as they may draw minimal budgeting. A lack of attention to these important factors may lead to a loss in workforce with a direct impact on patient care.

Participants' coping strategies for back pain experiences demonstrated the use of both active and passive strategies. While use of pain relief medication was widely used, physical exercises, physiotherapy rehabilitation, dietary supplements, stress management and rest were other strategies implored. Other studies have also reported the use of pain medication, dietary supplements (Mwilila, 2008), stress management, physiotherapy, or occupational therapy as coping strategies for back pain (Richardson et al., 2019; Geiger-Brown et al., 2004). These studies

identified the elimination of stooped working positions, a no-lift policy, and use of lifting teams as strategies for minimising the effects for back pain (Richardson et al., 2019; Geiger-Brown et al., 2004). Elimination of stooped working positions where nurses are encouraged to sit down at the bedside is achievable in low-income settings and can be enhanced through training. However, because of inadequate staffing levels the nurse and patient ratio at a given time may hinder the performing of nursing activities in the sitting position because nurses may work to get their work assignments done. Change of jobs was also a coping strategy that was reported in previous studies (Richardson et al., 2019; Boniface, Ghosh & Robinson, 2016; Geiger-Brown et al., 2004). This option for most low-income settings is not practical because the opportunity for job changes are limited. Using active self-management strategies to cope with back pain especially in low-income settings appear to be an approach that can substantially reduce the levels of back pain and disability. This is because active self-management strategies can reduce pain efficacy beliefs, depressive symptoms and fear avoidance beliefs (Crowe et al., 2010). Active coping strategies may also lead to behaviour modification or a change in attitudes, abilities, or coping strategies (Richardson et al., 2019). This may be beneficial in promoting health and well-being among nurses in their work settings.

Notably in this study some participants echoed that some of their back-pain discomforts were due to stress. However, even though they managed other people with stress, they had difficulty in managing and coping with their own stress. Factors like excessive workload, lack of social support and not having enough control over job-related decisions may cause cumulative stress that can interfere with physical health and performance (Segal et al., 2018). This suggests that developing and incorporating a support system that would promote physical stress relief such as relaxation and stretch exercise activities in the work settings may help nurses to regain their balance.

Limitations

It is important to note that participants were sourced from one healthcare centre in the peri-urban region of Lusaka. Hence, their perspectives may be specific to their work context and may thus only be generalisable to similar contexts. The participants reflected on their own perspectives about back pain; and they were exposed to several other interacting factors that could be the cause of back pain disability. However, even though the outcomes from this study are specific to participants who took part in this study similar situations may occur in other settings.

Conclusions

Nurses identified context-specific factors as job-related factors comprising workload factors and work environment factors as the main contributors for back pain. Workload factors were high workload, inadequate human resources, high patient load, long working hours and mode of performing tasks; while environmental factors comprised equipment, furniture and work settings. To cope with back pain, participants used both active and passive strategies such as physical exercises, physiotherapy rehabilitation, dietary supplements, stress management, pain relief medication and rest. To address the problem of back pain in nurses, a multipronged approach involving healthcare system factors, infrastructure, organisational factors and education is advocated.

Declaration by the candidate

Nkhata, L.A., Brink, Y., Ernstzen, D. & Louw, Q.A. 2020. Nurses' perspectives about context specific job factors and coping strategies for back pain experiences among nurses in Lusaka, Zambia: A qualitative study. *International Journal Nursing and Midwifery*, 2(1):22-31. doi:10.5897/IJNM2019.0412

Regarding chapter 3, the nature and scope of my contribution were as follows:

Author	Email-address	Nature of contribution Extent of contribution	Percentage (%)	Signature
Loveness A. Nkhata	Lnkhata@yahoo.com	Study conception and design: acquisition of data; analysis and interpretation of data; drafting of manuscript and critical revision.	80%	
Prof. Quinette A. Louw	qalouw@sun.ac.za	Supervisory role: conception and drafting, critical revising for important intellectual content and final approval of the version to be submitted.	10%	
Dr Yolandi Brink	ybrink@sun.ac.za	Supervisory role: drafting the article and revising it critically for important intellectual content.	5%	
Dr Dawn Ernstzen	dd2@sun.ac.za	Supervisory role: analysis and interpretation of data; drafting of manuscript, critical revision and proofreading	5 %	

CHAPTER FOUR

Cross-cultural validation and formulation of key evidence-based back pain messages for Zambian nurses

This chapter presents the cross-cultural validation and formulation of key evidence-based back pain messages identified and synthesised from study 1. Figure 6, shows the schematic layout of the structure of chapter 4 in the dissertation

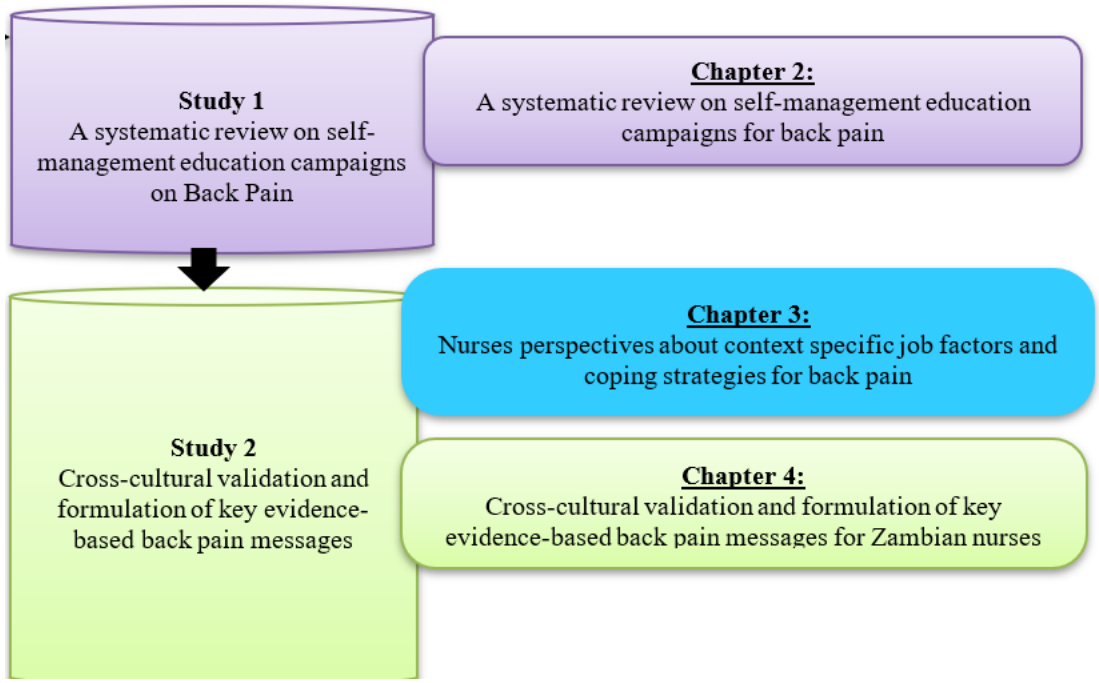

Figure 6: Schematic layout of the structure of chapter 4 in the dissertation

4.1 AIM AND OBJECTIVES

The aim was to cross-culturally validate key evidence-based back pain messages which were identified and synthesised in study

4.1.1 Objectives

- Cross-culturally validate evidence-based messages synthesised from Study 1
- Formulate back pain messages for nurses in Zambia

4.2 STUDY DESIGN

A qualitative descriptive study was conducted. A cross-cultural validation approach using the Herdman et al., (1997) framework (Figure 7) was used to obtain insight, understanding of stakeholders' perspectives, experiences and opinions on the synthesised back pain campaign messages on self-management and the extent to which they were applicable to the nurses in Zambia. The goal of using the cross-cultural validation process was to achieve conceptual, item and semantic equivalence in the revised evidence-based messages for back pain. Conceptual equivalence is concerned with cultural equivalence while item equivalence focuses on the acceptability and relevance of the revised items in the target settings (Dandun et al., 2017; Huang & Wong, 2014). Semantic equivalence emphasises the meaning for each term in both cultures following revision of the items (Dandun et al., 2017; Huang & Wong, 2014). Thus, cross-cultural validation refers to whether measures that were originally generated in a single culture are applicable, meaningful, and equivalent in another culture (Huang & Wong, 2014). This approach was appropriate for the adaption of back pain messages because the process focused on determining whether the participants had understood the back-pain messages and whether the language was culturally appropriate and acceptable (Huang & Wong, 2014). Operational and measurement equivalences were not applicable since the object for the cross-cultural validation was back pain campaign messages on self-management and not a scale or questionnaire.

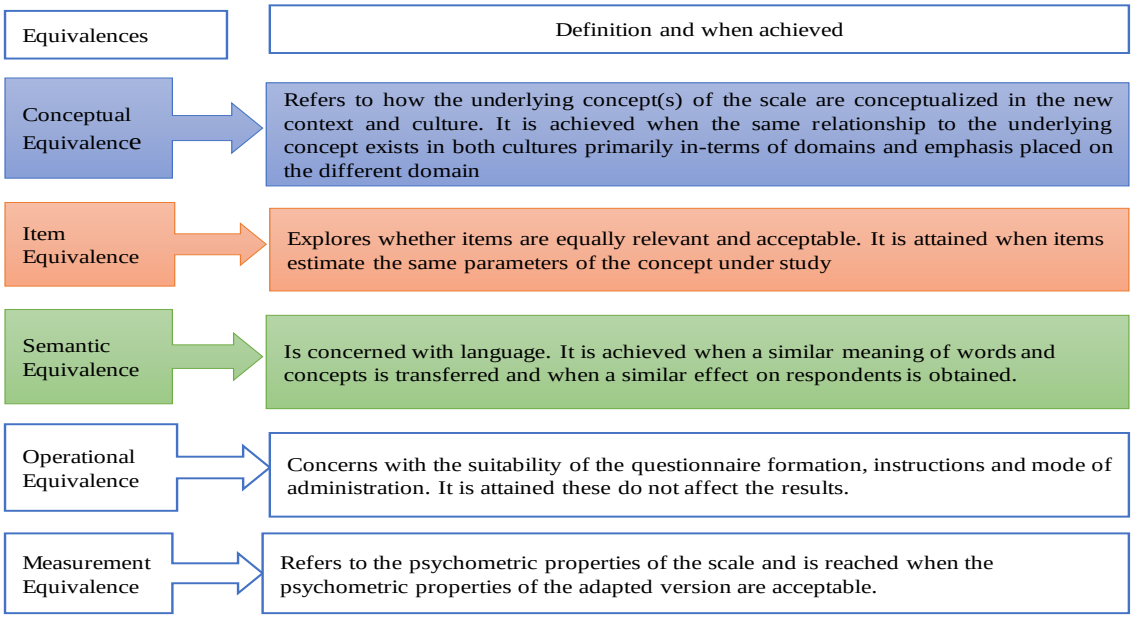

Figure 7: Cross-cultural validation framework (Herdman et al., 1997)

4.3 STUDY SETTING

The study was done in Lusaka at Chelstone Hospital a public facility in a peri-urban area of Lusaka which was not part of the intervention study (Study 3) to reduce cross-contamination. The facility provides various health services to both in and outpatients including public health programmes at community level such as, interventions for common conditions such as, maternal and child health, HIV and AIDS, tuberculosis, water sanitation and malaria (LDHO, 2017).

4.4 STUDY POPULATION

The population comprised enrolled and registered nurses including nursing managers and administrators from a public facility in a peri-urban area of Lusaka.

4.5 SAMPLING

A maximum variation sampling approach, also known as heterogeneous sampling technique, was used to capture a wide range of perspectives relating to the matter under study. Maximum variation approach is a search for variation in perspectives, ranging from individuals, conditions or events that are viewed as typical to those that are more extreme in nature (Corbin & Strauss, 2015; Ponelis, 2015). The basic principle behind using the maximum variation approach is to gain greater insights into the phenomenon by looking at it from different angles which in turn allows the researcher to identify common themes that are evident across the sample.

There were approximately seventy-five nurses working at the facility. A list indicating specialty was obtained and participants were conveniently selected to ensure that the criteria for maximum variation were met which included registered nurses, enrolled nurses, midwife nurses, public health nurses, nurse managers and nurse administrators. Nurses from different work specialities at the facility were invited to participate in the study because those spheres were applicable at the hospital. The principal nursing officer helped to identify and recruit the eligible who were available at the time of data collection and serving in different departments.

4.6 SAMPLE SIZE

A sealing of 8-12 persons for each focus group is recommended (Cameron, 2011). In this study, the researcher hosted three focus group discussions (FGDs) with 10 or 11 participants in each (men and women) who comprised: (1) registered and certificate level nurses, (2) specialist nurses such as midwives, and (3) nurse managers and senior nursing officers, which gave a sample size of 32.

4.7 ETHICS

Ethical clearance for this study was obtained as part of a bigger project entitled: "The effectiveness of a contextualised back pain campaign for nurses in Lusaka, Zambia" from Stellenbosch University Health Research Ethics Committee (Reference #: S18/06/125s; Project ID:7431); the University of Zambia Health Sciences Research Ethics Committee (Protocol ID: 20181016002), the National Health Research Authority, the Lusaka District Health Office and the participating Health Centres. Informed consent was also obtained from individual participants before data collection.

4.8 DATA COLLECTION AND INSTRUMENTS

Sociodemographic and work data was obtained using a self-administered form before commencing group discussions (Appendix D). A total of three focus group discussions (FGDs) with the aid of a discussion guide (Appendix C), that had semi-structured questions, were used for cross-cultural validation of fourteen (14) evidence-based back pain campaign messages derived from Hoy et al. (2010), Werner et al. (2008), Waddell et al. (2007), and Buchbinder et al. (2008); refer to study 1 chapter 3. FGDs were conducted in the dental department of the hospital as it was a place identified as being convenient and culturally appropriate by the participants. The setting was quiet and private to avoid distractions or interruptions of interviews and the researcher ensured that participants were comfortable and at ease throughout the interviews. To obtain stakeholder perspectives and opinions on key evidence-based back pain messages the researcher allowed participants to set the pace and be free in discussions. However, the researcher asked probing questions at appropriate points of interest to uncover a deeper understanding of issues relating to the research objectives. Additionally, the researcher also invited questions from participants about the research project during the discussions. The interviews were recorded using an electronic audio recorder and transcribed verbatim by professional transcribers. During the interviews, notes were taken on dynamic emotional aspects such as, reluctance and strong feelings attached to opinions or language used during the FGDs. Data verification was done by asking participants to further elaborate on information and having participants respond to the summary of their responses. The recommended length for FGD interviews is between 1.5 to 2 hours (Guest, Namey & Mckenna, 2016; Onwuegbuzie et al., 2009) with breaks. The researcher applied the 1.5 hours recommendation because of the venue availability and participants' work schedules.

4.9 DATA ANALYSIS

After each FGD, the researcher completed notes on the discussion using the participants' own words. The researcher endeavoured to maintain neutrality and objectivity during data analysis and was as transparent as possible during interpretation to serve the needs of the target group. The cross-cultural validation framework (Herdman et al., 1997) was used to deductively analyse data per back pain message to ascertain equivalence or non-equivalence of concept (CE), Item (IE) or semantics (SE) in the contents of the message items. The analysis focused on the characteristics of communication language with attention to the content and contextual meaning of texts (Hannock et al., 2016). Knowledge was generated using the participants' perspectives which were grounded in the actual data and focused on the principles of conceptual equivalence, item equivalence and semantic equivalence. To identify the CE, IE and SE (equivalence vs non-equivalence) items in the back-pain messages were checked one by one for logic, understanding and language. For quality assurance, the changes in the messages was discussed by the supervisors (DE, QL and YB), to ensure that all ideas and vocabulary in the revised messages had a similar meaning as in the original.

4.10 RESULTS

4.10.1 Participants' demographic descriptions

Table 9 provides the participants' characteristics. There were thirty-two participants who took part in the FGDs, which included 31% men. The most common age category was 51-60 years. All the participants were in full-time employment and half of the participants 46.9% (15) were working in the maternity and neonatal department and 37% (n=12) had undergone midwifery training. Three nurses with Bachelor of Science degrees were nurse managers and administrators, and 5 public health nurses were running the anti-retroviral therapy (ART) clinic.

Table 9: Participants' demographic descriptions (N=32)

Variable	Frequency (n)	Percentage (%)
Gender:		
Male	10	31%
Female	22	68.8%
Age at last birthday:		
20-30	6	18.8%
31-40	7	21.8%
41-50	7	21.8%
51-60	11	34%
Work status in the last 12 months		
Full Time	32	100%
Work Setting		
General ward	4	12.5%
Maternity and neonatal ward	15	46.9%
ART Clinic	4	12.5%
OPD clinic	8	25%
Qualifications		
Certificate	5	15.6%
Diploma	24	75%
Bachelor's Degree	3	9.4 %
Specialty Training		
Midwifery	12	37%
Public Health nursing (ART)	5	15.6%
Number of work hours per week		
< 40 hrs.	4	12.5%
40. hrs.	21	65.6%
> 40 hrs.	7	21.8%
Years of professional experience		
5-10	13	40.6%
11-20	5	15.6%
21-30	9	28 %
31-40	5	15.6%

4.11 REVISION OF KEY EVIDENCE-BASED BACK PAIN MESSAGES FOR NURSES IN ZAMBIA

The fourteen (14) key evidence-based back pain messages table 10 (identified in Chapter 1) were presented, assessed, and revised (where appropriate) for language, relevancy, and acceptability. Messages conveying a similar meaning were combined into one which reduced the messages to seven (7). The original messages as well as the adopted and revised messages are summarised in table 11. The revisions were done to ensure messages fit into the nurse's settings and situations and enhance understanding of each message (where deemed appropriate). A summary is provided below regarding the factors that played a role in the revision or adoption of each of the messages. Verbatim quotes are provided to illustrate the applicability of CE, SE or IE per back pain message

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Table 10: Summary of the revised key evidence-based back pain messages

Original message	Revised message	Comment
1. Back pain is rarely caused by a dangerous illness	Back pain is rarely caused by a dangerous illness	Adopted
2. Back pain: don't take it lying down 3. The key to feeling better sooner is to stay active 4. Back pain is not a serious problem continue usual activities 5. Don't rest for prolonged periods 6. A back in motion improves faster 7. Work with your back, one recovers fast by returning to work as quickly as possible 8. Continue exercising and remain at work	The key to feeling better sooner is to stay active	Adapted
9. Positive attitudes are important, and it is up to you	Back pain is a personal responsibility, it is up to you to look after your back	Adapted
10. X-ray rarely reveal the cause of back pain. X-rays are not useful	X-rays are not useful to detect the cause of back pain	Adapted
11. Surgery may not be the answer to keep employees at work. Only a few people need surgery	Surgery is not the answer for back pain	Adapted
12. Try simple pain relief, If you need it to get advice 13. There's a lot you can do to help yourself	Avoid taking unnecessary pain killers when you have back pain; there is a lot you can do to help yourself.	Adapted
14. The prognosis is usually good	Back pain usually gets better over time	Adapted

4.11.1 Back pain is rarely caused by a dangerous illness

The above message was adopted as is, since the participants agreed that there was SE, IE and CE for the statement relating to the Zambian context, as can be seen from the quotes given below. Initially participants had difficulty with the phrasing of the message because they felt there were diseases such as TB that could cause back pain. Participants agreed to pay attention to the word 'rarely' as a catchword in the message. They resolved to uphold the message in its entirety as they could identify with back pain which they experienced as nurses that is mostly due to work overload and awkward postures which confirms congruent SE and IE.

"I don't know how it weighs up. Because there are some diseases example, TB spine, it can make someone develop back pain." ***Participant FGD 1***

"I think it can stand the way it is. Yes, because it's true, it's rarely the backache that we experience as nurses are truly rarely caused by a dangerous illness." ***Participant FGD 1***

" Rarely is the catchword. I'm not sure whether they are talking about, dangerous illnesses like, maybe pneumonia, TB, you know. So, as nurses what causes back pain is something that is related to the way we posture our bodies during work, and as we rest, I suppose." ***Participant FGD 1***

"In relation to us, the nurses? I think it's true, it's rarely caused by a dangerous illness. Mostly it's due to the work that we do." ***Participant FGD 1***

4.11.2 Back pain: don't take it lying down

There were IE and SE matters (non-equivalences) with the message "back pain: don't take it lying down," as participants had difficulties in interpreting and understanding its meaning and whether it was applicable to all degrees of back pain. After deliberations participants understood that the message was encouraging physical activity. In their understanding, they concluded that one is not supposed to lie down when you have back pain but continue doing some physical activities as highlighted in the verbatim quotes below.

"Okay, I don't understand number 2. I really feel that this one should be rephrased because I don't know, it was the first one that caught my attention. Yes, I was like what are we really trying to say here?" ***Participant FGD1***

"Back pain will not be relieved by lying down; can't be relieved by lying down." ***Participant FGD 1***

"So, this one, don't take it lightly. Don't take it, it's like don't take… it's like we know when you are lying down, you cannot fight something the way you can fight as opposed to when you're standing up. So, don't take it lying down means you know, you don't take it too, don't succumb yourself to a position so that that backache continues, so to say." ***Participant FGD 1***

In the pursuit of understanding this message better, participants examined the subsequent messages that are: three to eight **[Back pain is not a serious problem continue usual activities, don't rest for prolonged periods, A back in motion improves faster, the key to feeling better sooner is to stay active, Work with your back, one recovers faster by returning to work as soon as possible, Continue exercising and remain at work if possible]** and realised that regardless of the terms, motion, movement and exercise were congruent and had the same meaning as they were all encouraging physical activity in an event of back pain experience (IE & SE). Keeping employees at work and staying at work was also considered as a way of encouraging physical activity.

"It's like number 2 can be connected to 4 where… instead of like or *when you have backache, of course…what usually happens is when you have a backache you are given a sick note to go and rest. But according to the messages here, you are not supposed to go and lie down or whatever, but you need to continue doing some activities, and I'm sure in the activities there's a way of lessening or trying to lessen the back pain."* ***Participant FGD1***

I think number 2 and number 4, for me, is saying when you have a backache, continue your usual activities, don't refrain from them, because you may just aggravate the pain." ***Participant FGD1***

"What about number 2 and number 5, don't they have the same meaning? Don't rest for prolonged periods." ***Participant FGD 1***

"I think 6, 7 and 8 also tie up with 3. The key to feeling better sooner is to stay active. Which is what 6, 7 and 8 are talking about. Work with your back, one recovers faster by returning to work as soon as possible, meaning do not stop working, continue using your back, yes. We continue using, doing the same back movements." ***Participant FGD 1***

"*But they are similar, it's only that.it is the terms, I know they're going to the same angle."* ***Participant FGD 1***

"I think they can be connected into one message because all of them are talking about staying active, usual activities, don't rest for prolonged, they are all talking about avoiding rest, or lying down, or succumbing to the back pain. So, they can actually be summed up into one." ***Participant FGD 1***

"I'm getting this point from 8, Stay active, continue working and exercising with back pain as it is key to get better soon." ***Participant FGD 1***

Due to conceptual and semantic equivalence between the 7 messages, consensus was reached that the aspects of the messages in 2-8 be combined and the final message to read as, **"The key to feeling better sooner is to stay active."**

4.11.3 Positive attitudes are important, and it is up to you

Participants measured the IE and SE in the message as being self-explanatory. They related attitudes to the steps a person would take in alleviating the pain. In their views the message meant caring for the back was a personal responsibility hence an individual needed to look after themselves.

"I think the way it is here it's a self-explanatory, positive attitude which means we know that when I work like this or the way the place is, how busy it is, definitely we experience this. You have, preoccupied the mind as you even go to work, let's do work of this. So, you must accept it that I will have the pain maybe after I finish the work. So, acceptance." ***Participant FGD 2***

"I feel like we've all taken it upon ourselves to find a remedy for the back pain, and that's having a positive attitude towards pain alleviation, but I think if you had to rephrase it, put it in a different format, I'd say the same attitude that you're committing to alleviating back pain, that's the same attitude that you should also put into preventing that back pain." ***Participant FGD 2***

"If we read again, message 9 says, its positive attitudes are important, and it is up to you. So…it's because of what I've been doing...let's say you are in the ward and you want to help a patient, you don't need to lift that patient up alone. Because nursing is teamwork, you ask for help from a colleague, with that attitude you've taken responsibility. While doing that you are avoiding a heavy load of a patient, since you can't manage alone." ***Participant FGD 2***

For easier and better understanding participants considered the CE, IE, and SE and agreed to re-word the message as, **"Back pain is a personal responsibility, it is up to you to look after your back."**

4.11.4 X-ray rarely reveal the cause of back pain; X-rays are not useful

Participants' reflections on the message exposed IE non-equivalence regarding acceptability and relevance. This is because they had mixed opinions about the meaning of this message depending on their beliefs and/or experience. Initially they alleged this statement was not entirely true because in their opinion x-rays may visualise the cause of back pain such as slipped discs but may not dictate the type of back pain. However, from cultural viewpoint, participants echoed that the statement could be applicable to back pain arising from everyday work routines confirming CE.

"I think you know, the message is very black and white, because I know there can be X-rays that can visualise the cause of a back pain as in maybe a slipped disc or something like that, so I feel that statement in itself is not entirely true because someone may be complaining of back pain, every day. You may think that it's maybe something simple, yet it's something serious." ***Participant FGD 2***

"I feel I may add, it's not always that, it depends on the type of back pain that someone has, because as we put it in the everyday work we do here, then the statement can do with that, but when it comes to certain illnesses that cause the back pain and you find that maybe there are some discs with cracks and sometimes extra bone growth on the spine, and that will make someone to have back pain. So, it's not always that the X-ray cannot reveal. It can, and it cannot. Depending on the type of back pain that someone has." ***Participant FGD 2***

"If it is in our workplace then we know that the work that we do, sometimes can be strenuous and can cause the back pain. Again, if we say x-rays cannot reveal the proper cause of back pain, and X-rays are not necessary for the treatment of back pain…but if we think thoroughly, x-rays can detect." ***Participant FGD 2***

"As much as we shouldn't rely on x-rays, the doctor may say do you an x-ray, then the X-ray findings will point to nothing and the clinician will even say or explain that there is nothing there, but then they will end up escaping the patient." ***Participant FGD 2***

Participants also reasoned that in their set up the message could be helpful in that it is not always possible that every time one had back pain, an x-ray will be taken.

"Now in our set-up, we cannot say you have back pain you want to go for X-rays. Every time you have back pain you want to rush to the x-rays?" ***Participant FGD 2***

Participants then reached consensus to have the message conveyed as **" X-rays are not useful to detect the cause of back pain,** " because in their workplace the cause of back pain is usually due to strenuous workload so x-rays are not necessary in detecting the cause of this type of back pain.

4.11.5 Surgery may not be the answer keep employees at work; only a few people with back pain need surgery

Participant's opinions showed that this message was straight forward. They approved that surgery was only reserved for special conditions and not for a sore back, arising from work routines. Therefore, there was SE, CE and IE for this message.

"Yes, what that says is straightforward, it's not that one has no… it's just straightforward. Surgery is not the answer for work-related back pain." ***Participant FGD 2.***

"Surgery is not the answer. Only a few people with back pain need surgery. Yes, as it is, and we go back to our setup. A sore back may not need surgery." ***Participant FGD 2***

"Am going to say surgery is not the answer for work-related back pain. I think that is okay, only a few people with back pain need surgery. So basically, surgery is reserved for the specific conditions." ***Participant FGD 2***

"I think that is okay, but if we also change the last bit about the statement, only a few people with back pain need surgery. So, if we must deliver a short message on that, in our set up surgery is not necessary, and people do not stay away from work because…" ***Participant FGD 2***

Participants resolved that for easy understanding, the message should be written as, **"Surgery is not the answer for back pain."**

4.11.6 Try simple pain relief: If you need it, get advice

Participants identified early in the discussion that they did not know what was meant with simple pain relief which shows CE, IE and SE non-equivalences. Participants' understanding of this message was that in an event of back pain it is better for one to do without the analgesics unless it perseveres. However, participants felt that the term simple pain relief in the statement was confusing because the meaning of 'simple pain relief' was unclear as it could fit pharmacological or non-pharmacological modalities.

I don't know, this is confusing to say simple pain relief, which one is simple pain relief? Unless we maybe put it in such a way that doesn't have anything to do with the drugs, maybe we can say non-

pharmacological. Because this can cause confusion like… this simple does it mean to do away with the drugs or what? Panadol, analgesics, B6; should it be seeking medical advice?" ***Participant FGD 3***

"Pain relief is not always drugging it can be cold compress, hot compress. sometimes massage. Maybe we say you try mild analgesics if that is needed. Are we avoiding using chemicals in avoiding simple relief?" ***Participant FGD 3***

After further discussion, participants resolved that the message was also promoting the use of other remedies in managing back pain experiences. Participants likewise indicated that this message was somehow relating to the message "**there's a lot you can do to help yourself."** This is indicated by the quotes below. However, in this statement participants' understanding was that there were measures one could take to help one recover such as physical exercises and use of other remedies as long as they maintained a positive attitude. It was then decided that the messages be combined to read as, **"avoid taking unnecessary pain killers when you have back pain; there is a lot you can do to help yourself."**

"You know everybody is talking about drinking pain killers and all that stuff, but there are many other different things that you can do. Like for me personally, I do stretches and do lower back exercises and I find that if I do those for three days, I won't experience any back pain for at least a month. So, the messages are just recommending use of other remedies, apart from the pharmaceutical ones." ***Participant FGD 3***

"So, we can say, there are some measures you can do to help yourself recover like physical exercises. Avoid taking unnecessary pain killers when you have back pain, get medical advice on measures you can take to help yourself recover." ***Participant FGD 3***

4.11.7 The prognosis is usually good

Participants related and linked this message to earlier messages because they believed that the prognosis would be good when one maintained a positive attitude, remained focused and persistent in taking the measures that could help them recover. Hence there was CE, IE, and SE for this message.

"If somebody has a positive attitude towards oneself you are focused, you are going to achieve what you want. If you are determined, meaning you are going to follow those exercises that you want to do. If you follow them rigorously you are going to get better." ***Participant FGD 3***

"Yes, because with focus I think you will also carry along being persistent. So, I think focus and persistence will bring out good results." ***Participant FGD 3***

"I think it is one and the same thing, it's just language because you were saying if we follow all these measures so the process of us following that, it means we are focused." ***Participant FGD 3***

Participants further deliberated that over time, if one remains focused and recommended measures are followed, back pain gets better. Therefore, it was agreed that the message was a confirmatory message and be written as **"back pain usually gets better over time."**

"The prognosis is good if you follow set measures. I think the way she talked about being focused we can say if you are focused prognosis of back pain gets better." ***Participant FGD 3***

4.12 SUMMARY OF DEDUCTIVE ANALYSIS

The summary of the deductive analysis for cross-cultural validation according to CE, IE and SE (Herdman et al., 1997) is shown in table 11 below. Equivalences and non-equivalence identified in the messages, participants' exemplar quotes and motivation for actions taken is highlighted in the table.

Table 11: Deductive analysis for cross-cultural validation according to CE, IE and SE.

Message 1: Back pain is rarely caused by a dangerous illness				
Exemplar quotes	**Concept**	**Item**	**Semantics**	**Reason/Motivation**
"I don't know how it weighs up. Because there are some diseases example, TB spine, it can make someone develop back pain." Participant FGD 1	-	NE	NE	Clarity of the initial questions of the relevance of this statement regarding different condition. The meaning on "dangerous illness" is unclear.
"I think it can stand the way it is. Yes, because it's true, it's rarely the backache that we experience as nurses are truly rarely caused by a dangerous illness."	-	E	E	Statement is confirmed as relevant to nurses.
" Rarely is the catchword. I'm not sure whether they are talking about, dangerous illnesses like, maybe pneumonia, TB, you know. So, as nurses what causes back pain is something that is related to the way we posture our bodies during work, and as we rest, I suppose." Participant FGD 1	-	NE E	E	Initial questions regarding relevance of the phrase "dangerous illness" is replaced with general nursing context. Statement is congruent with nurse's experience. The semantic meaning of the word "rarely" and its importance in interpreting the statement is highlighted
"In relation to us, the nurses? I think it's true, it's rarely caused by a dangerous illness. Mostly it's due to the work that we do."	-	E	E	Statement is congruent with participants' experience.
Message 2: Back pain: don't take it lying down				
"Okay, I don't understand number 2. I really feel that this one should be rephrased because I don't know, it was the first one that caught my attention. Yes, I was like what are we really trying to say here."		NE	NE	Meaning of statement is unclear
"Back pain will not be relieved by lying down; can't be relieved by lying down."		E		Statement is consistent with nurse's experience.
"So, this one, don't take it lightly. Don't take it, it's like don't take… it's like we know when you are lying down, you cannot fight something the way you can fight as opposed to when you're standing up. So, don't take it lying down means you know, you don't take it too, don't succumb yourself to a position so that that backache continues, so to say."	E		E	The semantic meaning in interpreting the statement is highlighted

E = equivalent vs NE = non-equivalent/lack of equivalent

Table 11: Deductive analysis for cross-cultural validation according to CE, IE and SE.

Back pain is not a serious problem continue usual activities, don't rest for prolonged periods, A back in motion improves faster, the key to feeling better sooner is to stay active, Work with your back, one recovers faster by returning to work as soon as possible, Continue exercising and remain at work if possible				
Exemplar quotes	**Concept**	**Item**	**Semantics**	**Reason/Motivation**
"It's like number 2 can be connected to 4 where… instead of like or when you have backache, of course…what usually happens is when you have a backache you are given a sick note to go and rest. But according to the messages here, you are not supposed to go and lie down or whatever, but you need to continue doing some activities, and I'm sure in the activities there's a way of lessening or trying to lessen the back pain."	E	E	E	The semantic meaning in interpreting the statement is highlighted and participants considered that doing some activities will lessen back pain instead of lying down
I think number 2 and number 4, for me, is saying when you have a backache, continue your usual activities, don't refrain from them, because you may just aggravate the pain."	-		E	Participants consider continuation of physical activities with back pain
"I think 6, 7 and 8 also tie up with 3. The key to feeling better sooner is to stay active. Which is what 6, 7 and 8 are talking about. Work with your back, one recovers faster by returning to work as soon as possible, meaning do not stop working, continue using your back, yes. We continue using, doing the same back movements."	-	E	E	Semantic meaning and importance highlighted in the statement
"I think they can be connected into one message because all of them are talking about staying active, usual activities, don't rest for prolonged, they are all talking about avoiding rest, or lying down, or succumbing to the back pain. So, they can actually be summed up into one."	E	-	-	The statements are relevant and become acceptable
Positive attitudes are important, and it is up to you				
"I think the way it is here it's a self-explanatory, positive attitude which means we know that when I work like this or the way the place is, how busy it is, definitely we experience this. You have, preoccupied the mind as you even go to work, let's do work of this. So, you must accept it that I will have the pain maybe after I finish the work. So, acceptance."	-	E	E	Statement is clear and consistent with nurses' experiences
I feel like we've all taken it upon ourselves to find a remedy for the back pain, and that's having a positive attitude towards pain alleviation, but I think if you had to rephrase it, put it in a different format, I'd say the same attitude that you're committing to alleviating back pain, that's the same attitude that you should also put into preventing that back pain."	-	E	-	The semantic meaning in interpreting the statement is highlighted
"If we read again, message 9 says, its positive attitudes are important, and it is up to you. So…it's because of what I've been doing……let's say you are in the ward and you want to help a patient, you don't need to lift that patient up alone. Because nursing is teamwork, you ask for help from a colleague, with that attitude you've taken responsibility. While doing that you are avoiding a heavy load of a patient, since you can't manage alone."	E	E	E	Healthcare context and semantic meaning highlighted

E = equivalent vs NE = non-equivalent/lack of equivalent

Table 11: Deductive analysis for cross-cultural validation according to CE, IE and SE.

X-ray rarely reveal the cause of back pain; X-rays are not useful				
Exemplar quotes	**Concept**	**Item**	**Semantics**	**Reason**
"I think you know, the message is very black and white, because I know there can be X-rays that can visualise the cause of a back pain as in maybe a slipped disc or something like that, so I feel that statement in itself is not entirely true because someone may be complaining of back pain, every day. You may think that it's maybe something simple, yet it's something serious."	-	NE	E	Initial response on acceptability and relevance of message as participants considered that there are instances where X-Rays may be useful.
"I feel I may add, it's not always that, it depends on the type of back pain that someone has, because as we put it in the everyday work we do here, then the statement can do with that, but when it comes to certain illnesses that cause the back pain and you find that maybe there are some discs with cracks and sometimes extra bone growth on the spine, and that will make someone to have back pain. So, it's not always that the X-ray cannot reveal. It can, and it cannot. Depending on the type of back pain that someone has."	-	NE	E	Initial response on acceptability and relevance of message as participants considered that there are instances where X-Rays may be useful.
"Now in our setup, we cannot say you have back pain you want to go for X-rays. Every time you have back pain you want to rush to the x-rays?"	-	E	E	The message becomes acceptable and relevant, due to the (Zambian) healthcare context regarding the availability of resources for X Rays.
Surgery may not be the answer keep employees at work; Only a few people with back pain need surgery				
"Yes, what that says is straightforward, it's not that one has no… it's just straightforward. Surgery is not the answer for work-related back pain."	E	E	E	Statement is clear and relevance of message is considered useful
"Surgery is not the answer. Only a few people with back pain need surgery. Yes, as it is, and we go back to our setup. A sore back may not need surgery."	E	E	E	Message is considered relevant in work setting
"I think that is okay, but if we also change the last bit about the statement, only a few people with back pain need surgery. So, if we must deliver a short message on that, in our set up surgery is not necessary, and people do not stay away from work because….	-	E	E	Statement is considered acceptable

E = equivalent vs NE = non-equivalent/lack of equivalent

Table 11: Deductive analysis for cross-cultural validation according to CE, IE and SE.

Try simple pain relief: If you need it, get advice [If you need it get advice: There's a lot you can do to help yourself				
Exemplar quotes	**Concept**	**Item**	**Semantics**	**Reason**
I don't know, this is confusing to say simple pain relief, which one is simple pain relief? Unless we maybe put it in such a way that doesn't have anything to do with the drugs, maybe we can say non-pharmacological. Because this can cause confusion like… this simple does it mean to do away with the drugs or what? Panadol, analgesics, B6; should it be seeking medical advice?"	NE	NE	NE	Meaning "of simple pain relief" in the statement is unclear and confusing
"Pain relief is not always drugging it can be cold compress, hot compress. sometimes massage. Maybe we say you try mild analgesics if that is needed. Are we avoiding using chemicals in avoiding simple relief?	-	E	E	Meaning of pain relief is linked to other methods
"You know everybody is talking about drinking pain killers and all that stuff, but there are many other different things that you can do. Like for me personally, I do stretches and do lower back exercises and I find that if I do those for three days, I won't experience any back pain for at least a month. So, the messages are just recommending use of other remedies, apart from the pharmaceutical ones."	-	E	E	Message is considered relevant and linked to performance of physical activity other than medications
So, we can say, there are some measures you can do to help yourself recover like physical exercises. Avoid taking unnecessary pain killers when you have back pain, get medical advice on measures you can take to help yourself recover."	-	E	E	Semantic meaning and interpretation in the message are highlighted
The prognosis is usually good				
"If somebody has a positive attitude towards oneself you are focused, you are going to achieve what you want. If you are determined, meaning you are going to follow those exercises that you want to do. If you follow them rigorously you are going to get better."		E	E	Semantic in message meaning highlighted
"Yes, because with focus I think you will also carry along being persistent. So, I think focus and persistence will bring out good results."	-	E	E	
"I think it is one and the same thing, it's just language because you were saying if we follow all these measures so the process of us following that, it means we are focused."	-	E	E	Clarity and semantic meaning confirmed.

E = equivalent vs NE = non-equivalent/lack of equivalent

4. 13 DISCUSSION

Use of formally validated and established guidelines has the advantage of building a cross-cultural knowledge for which findings can be compared (Brislin, 1986). This study aimed to cross-culturally validate and revise key evidence-based back pain messages for nurses in Zambia. Cross-cultural validation is a process that looks at both language and cultural adaptation of instruments or educational materials for use in other settings (Beaton et al., 2000). It ensures that the language for items is appropriate and culturally adapted to maintain content validity (Ballargrud, Hosebo & Hall-Lord, 2017; Beaton et al., 2000). The original back pain messages were used in the general population in Australia (Buchbinder et al., 2008), Canada (Gross et al., 2010), Norway (Werner et al., 2007), Netherlands (Suman et al., 2017) and Scotland (Waddell et al., 2007). Since the back-pain messages were intended for implementation in the Zambian context, where the healthcare context is vastly different from the countries listed above, it was hypothesised that the messages would need to be tailored for the implementation in Zambia. This ensured that: the same relationship to the underlying concept of back pain messages exists in both cultures; the same parameters of the concept under study are maintained and language gives a similar meaning of words and effect on respondents.

All the back-pain messages except for one (back pain is rarely caused by a dangerous illness) were adapted for use among nurses in Lusaka, Zambia. Further, some messages were adapted and combined into one because even though they had been written using different grammatical terms they conveyed similar messages. For instance, the messages “back pain: don’t take it lying down” (Buchbinder et al., 2008) and “don’t rest for prolonged periods” (Werner et al., 2007) though worded differently were all conveying a message to stay active during back pain experiences. This study also reports the methodological issues and experiences associated with the validation process for adaptation of the messages to share insights and recommendations.

Conceptual equivalence

Often, words hold different conceptual meanings between cultures (Beaton et al., 2000). Hence, conceptual equivalence is achieved when the same meaning to the underlying concept exists in both cultures (Dundan et al., 2017). Participants were asked about their thoughts and understanding of the domains related to the concept. Items in the revised evidence-based messages were not influenced by the local culture even though, differences in grammatical descriptions were identified with the use of English terms. To some extent that made it difficult for the participating

nurses to thoroughly understand the messages. For instance, “back pain: don’t take it lying down,” was complicated. Further, different cultural descriptions made it difficult to attain word-by-word equivalence. For example, the message, “a back in motion improves faster,” in this setting literally meant “a back that is moving” yet, the movement could be without a specific purpose or direction. Lack of equivalence coupled with language or culture limits the comparability of responses across populations (Beaton et al., 2000). Thus, replacing of words to attain cultural equivalence in a new culture is recommended (Huang & Wong, 2014; Beaton et al., 2000). However, the same words must be of meaningful and useful reflection in the new culture. Likewise, words and phrases of back pain messages were changed as shown in table 11, to enhance the conceptual equivalence and acceptability of the messages.

Item equivalence

The relevance of items may vary across cultures hence, item equivalence explores relevance and acceptability of items in the target culture (Huang & Wong, 2014). In this study, even though most of the items used in the evidence-based messages were acceptable and participants were able to relate to the items, a few items had lack of equivalence which made the messages unclear. For instance, the message “try simple pain relief: if you need it, get advice; there’s a lot you can do to help yourself,” participants mentioned that they did not know what was meant with simple pain relief. This is evident of non-equivalences especially such as IE. As a result, the items in this message had to be replaced with more relevant terms to ensure language was relevant, acceptable, and simple to understand in the target population. The message was rephrased to “avoid taking unnecessary pain killers when you have back pain; there is a lot you can do to help yourself.” Nonetheless, participants were supportive of back pain messages and were able to qualify the context within which they were to be used. According to Fischer et al., (2019), this indicates that participants had a positive impression about the items used in the key evidence-based messages. Further, there was no discomfort observed when participants deliberated or answered questions on any issues around the evidence-based messages. This could indicate that items were understood by participants and were acceptable and relevant for their settings despite words in some messages being replaced or sentences rephrased.

Semantic equivalence

Semantic equivalence refers to the understanding of the language used. It evaluates whether words that have been used mean the same or have multiple meanings to a given item (Fischer et al., 2019). Although there were a few insufficient semantic equivalences, the items were understood by all participants even if rephrasing was needed to ensure appropriate language for the needs of the target population. Good semantic equivalence was achieved when the words and phrases in the key-evidence based messages were changed where necessary, but effort was made to preserve their original meaning. Besides, the meaning of words was discussed amongst participants during group discussions so that they could bring across the meaning. During deliberations, it was observed that focused group debates on each message item facilitated in reaching a consensus on the most accurate and easily understood terms which added value to the cross-cultural validation.

4.14 CONCLUSION

Cross-cultural validation of the key evidence-based back pain messages for nurses in Zambia was beneficial as the method had more to do with changing of semantics to ensure relevance, acceptability, and clarity and less to do with cultural adaptations. As such, it promoted application and appropriateness of the items among the intended population. Consequently, the messages were user-friendly because they were easier, simpler to understand and presented ordered by importance. It also helped to reduce the number of messages and the repetition of concepts in messages. In addition, it was also observed that items in the message were understood by participants and showed acceptable conceptual equivalence and semantic equivalences. This is because participants were able to relate to the items even though rephrasing was needed for some items. This is significant because it allows equivalence and relevance of the messages that were first developed in high-income countries (HICs) and now adapted for implementation in a low- and middle-income country (LMIC) like Zambia. These differences in culture and methods used are beneficial to the body of knowledge and evidence in healthcare. However, it is important to understand that even though appropriate procedures were used, differences in semantic connotation may still exist because of regional variances. Therefore, it is important to be conscious of how these regional variances can be minimised. The study also depended on individual participants' reasoning and perceptions which may give rise to a range of biases; thus, a rigorous study design maybe considered for future research. However, our sample considered heterogeneity

among nurses and their reasoning and perceptions may reflect the level of understanding among the nursing population in Zambia. The final adapted and adopted messages were then considered in the next step (Chapter 5) and the intervention study (Chapter 6).

Declaration by the candidate

Nkhata, L. A., Brink, Y., Ernstzen, D., & Louw, Q. A.

Cross-cultural validation and formulation of key evidence-based back pain messages for Zambian nurses

Regarding chapter 4, the nature and scope of my contribution were as follows:

Author	Email-address	Nature of contribution Extent of contribution	Percentage (%)	Signature
Loveness A. Nkhata	Lnkhata@yahoo.com	Study conception and design: acquisition of data; analysis and interpretation of data; drafting of manuscript and critical revision.	80%	
Prof. Quinette A. Louw	qalouw@sun.ac.za	Supervisory role: conception and drafting, critical revising for important intellectual content and final approval of the version to be submitted.	10%	
Dr Yolandi Brink	ybrink@sun.ac.za	Supervisory role: revising it critically for important intellectual content.	5%	
Dr Dawn Ernstzen	dd2@sun.ac.za	Supervisory role: analysis and interpretation of data; drafting of chapter, critical revision, and proofreading	5%	

CHAPTER FIVE

Selecting priority back pain messages and intervention design

Chapter 5 is presented in 2 sections:

a) Selection of priority back pain messages
b) Intervention design

This chapter follows on the cross-cultural validation of the key back pain messages presented in chapter 4 (Figure 8) and describes the process followed to select the back-pain messages deemed most relevant to Zambian nurses. The cross-cultural validation and revision of the messages was necessary to endorse their applicability and relevance to the target population who were nurses in Lusaka, Zambia.

The nominal group technique (NGT) conducted to select the five priority `key messages for the Zambian nurses is described in the first section of this chapter.

Once the content (selection of priority key messages) of the campaign was affirmed, the intervention was designed. The intervention design is outlined in the second section of this chapter.

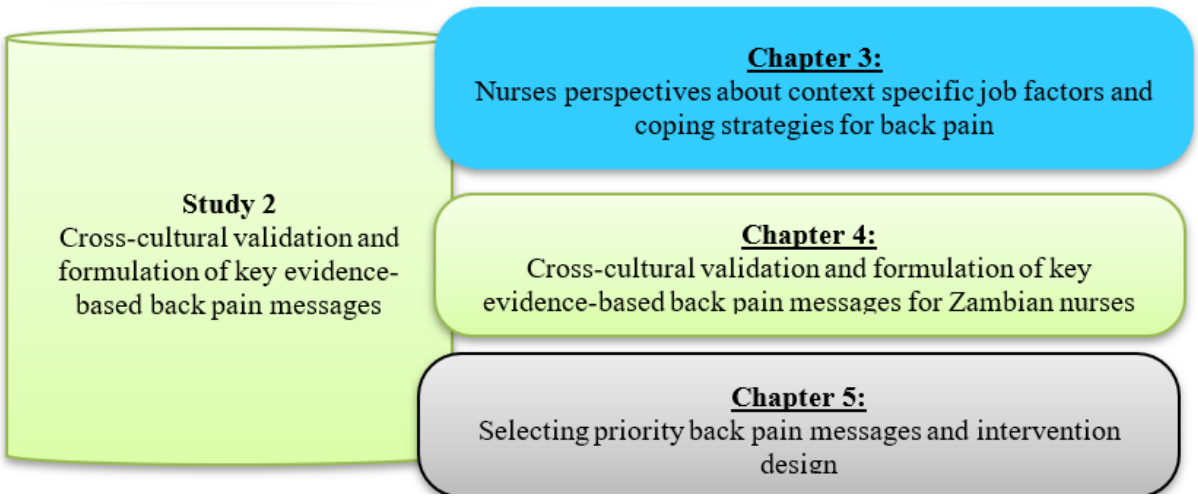

Figure 8: Schematic layout of the structure of chapter 5 in the dissertation

5.1 SECTION 1: AGREEMENT OF AND SELECTION OF PRIORITY MESSAGES FOR THE ZAMBIAN CONTEXT

We envisaged a campaign which focuses on the most pertinent messages for the Zambian campaign. Therefore, it was necessary to ascertain which messages are deemed a priority for impacting nurses positively regarding back pain management and education.

The objectives for this section were to:

5.1.1 Objectives

1. Obtain agreement of the adapted and adopted key back pain messages based on the cross-cultural validation (see Chapter 4)
2. Select five key messages for nurses in Zambia to be included in the Zambian campaign using a nominal group design

5.1.2 Study design

To obtain agreement and select the five key messages, for nurses in Zambia to be included in the back-pain campaign, the nominal group technique (NGT) was used. The NGT is a structured method of group decision making used to reach consensus (Dong, 2015; McMillan et al., 2014). The technique includes two main stages that is, the focus group discussion, and voting phase (Dong, 2015). This method allows for a rich generation of original ideas, balanced participation of all members of the group and a prompt ordered set of decisions (Dong, 2015; McMillan et al., 2014). Its format promotes meaningful interpersonal disclosures among participants by gathering equally weighted responses (Dong, 2015; McMillan et al., 2014). The technique has been widely applied in health and social services because it empowers participants by providing an opportunity to have their voices heard and opinions considered by other members (Kea & Sun, 2015).

5.1.3 Setting

The NGT group discussions were conducted in the boardroom at Chelstone Hospital in Lusaka. This location was recommended by study participants because of convenience, easy access and it could accommodate the required number of participants. Further, the setting was quiet and private to avoid distractions or interruptions and the researcher ensured that participants were comfortable

and at ease throughout the discussions. In addition, tables were organised in a U-shape, a flip chart at the open end and pens, papers, pencils, and sticky notes were provided.

5.1.4 Sample

A group of between 9 and 12 participants is optimal for NGT discussions but larger groups can also be held if they are well managed (Dang, 2015; Kea & Sun, 2015). For this survey three NGT group discussions were conducted, and each group had 12 participants to allow for a range of opinions. Participants were registered and enrolled nurses, midwives, nurse managers, public health nurses, and nursing administrators, who were working at the Chelstone Hospital but were not part of the initial FGDs where key message were revised (Chapter 5). This was a way of assessing understanding of the back pain messages. The principal nursing officer helped to identify and recruit the participants who were available at the time of data collection and serving in different departments. A list indicating specialty was obtained and participants were conveniently selected and recruited by the researcher after obtaining their informed consent.

5.1.5 Data collection procedures and instruments

Approximately 1-2 hours is the recommended timing for NGT discussions (Dang, 2015; Kea & Sun, 2015). Prior to the discussion, participants completed a brief demographic questionnaire that was used to describe characteristics like age, gender and work experience. All three group discussions were conducted by the researcher who was assisted by two research assistants who are physiotherapists by profession but have attained master's degree in public health and orthopaedic physiotherapy. Participants were informed of the objectives of the discussions and the NGT procedures were explained. Presented below is the procedure that was implemented:

- **NGT discussion sessions**

Introduction and explanation

Participants were welcomed and explanations of the purpose and procedure of the meeting were highlighted.

Silent generation of ideas

Participants were then provided each with a sheet of paper with the questions to be addressed and were asked to write down all ideas that came to mind when considering the questions. During this

time participants were not allowed to consult or discuss their ideas with each other. Time allowed for answering the questions was 10 minutes. The following set of questions were posed to participants about each revised message:

a. What is your understanding of this message?
b. Do you think other nurses will understand this message? If not, why do you think that they may not understand it?
c. What do you think other nurses will understand from this message?
d. Should the message be clearer? If so, how should it be adapted?
e. Are there any cultural/lifestyle factors in Zambia that may hinder nurses to act on this message?
f. Do you think this message is contrary to your current beliefs? Why?
g. What are the five most important messages for you? Why?

Sharing ideas

Participants were then invited to share their generated ideas and the researcher recorded each idea on a flip chart using the words echoed by the participant. This process continued until all the group's ideas had been presented. There was no debating at this stage, but participants were encouraged to write down any new ideas that arose from sharing. This process took about 20 minutes and ensured that all participants had an opportunity to make equal contributions and provided a written record of all ideas generated by the group.

Group discussion

At this stage participants were given an opportunity to give an explanation or more details about any of the ideas their colleagues put across. During this time, the researcher ensured that the process with regards to what each participant contributed was neutral, and that discussion of ideas was thorough without overspending time on one idea. The deliberations lasted approximately 20 minutes for all messages.

Voting and ranking

Recorded ideas were categorised according to the questions posed to the participants (see section on "silent selection of ideas" section. For each message, each participant summarised their ideas and perspectives about each message independently. Participants were then asked to select and

ranked on a scale of 1-5 the five key messages they deemed most relevant for Zambian nurses. This was to establish which messages were appropriate for the campaign.

Data analysis

This process allowed active engagement with the data and dependability and knowledge was generated using the participants' perspectives that emerged in the actual data. Descriptive statistics such as frequencies and percentages were used to summarise and present outcomes. The researcher aggregated the voting responses and the five key messages selected by most of the participants (based on % of participants voted for the message) was assumed to be group priority.

5.2. RESULTS

5.2.1. Participants' demographic descriptions

The demographic characteristics of the 36 participants are displayed in table 12. The majority (83.3%) of the participants were female and most participants (33.3%) were aged 31-40 years.

Table 12: Participants' demographic characteristics (N=36)

Variable	Frequency	Percentage (%)
Gender		
Male	6	16.6%
Female	30	83.3%
Age		
20-30	9	25%
31-40	12	33.3%
41-50	8	22.2%
51-60	7	19.4%
Work status in the last 12 months		
Full Time	35	97%
Part Time	1	2.7%
Work Setting		
Medical/Surgical ward	2	5.6%
Maternity and neonatal ward	15	41.7%
ART Clinic	4	11%
OPD clinic	15	41.7%

Qualifications		
Certificate	3	8.3%
Diploma	14	38.9%
Bachelor's Degree	1	2.8%

5.2.2 Participants' agreement with back pain messages

As can be seen in table 13, below data outcomes show that most of the participants agreed with the contents of the formulated back pain messages after cross-cultural validation

Table 13: Participants' agreement with back pain messages for nurses in Zambia

Message	Y (n/%)	N (n/%)	NS (n /%)
Back pain is rarely caused by a dangerous illness	32 (88)	3 (8.3)	1 (2.7)
The Key to feeling better sooner is to stay active	31 (86.1)	6 (16.6)	-
Back pain is a personal responsibility, it is up to you to look after your back	34 (94.4)	2 (5.5)	-
X-rays are not useful to detect the cause of back pain	27 (75)	8 (22.2)	1 (2.7)
Surgery is not the answer for back pain	31 (86.1)	4 (11.1)	1 (2.7)
Avoid taking unnecessary pain killers when you have back pain; there is a lot you can do to help yourself	36 (100)	-	-
Back pain usually gets better over time	34 (94.4)	1 (2.7)	1 (2.7)

5.2.3 Summary on participants' understanding and revision of key messages

The summary of the participants' understanding, and wordings for the revised messages is presented in table 14. Most messages were retained as originally phrased but one message (no. 2) was adapted to improve clarity.

Table 14: Participants' understanding of revised messages

Message	Understanding of message	Understanding by others	Clear/adapted	Cultural/lifestyle factors limiting action	Effect on current beliefs
1. Back pain is rarely caused by a dangerous illness	*Cause of back pain could be muscular or anything else but, sometimes can be serious illness.* ***NGT 1***	*Other nurses will probably have a similar understanding* ***NGT 1***	Maintained: Changing the wording will distort the information	*There is nothing specific to that.* ***NGT 1***	*It is contrary because most of the nursing fraternity has been trained to know that for the back.* ***NGT 1***
2. Stay active, continue working and exercising with back pain, it is key to getting better soon	*It's like you are encouraging people to work even when they have back pain* ***NGT 1***	*You are encouraging people to continue working despite the back pain* ***NGT 1***	Adapted The key to feeling better sooner is to stay active.	*At any point when you have back pain, we have been taught to do is to rest the back. The type of work that we do you cannot manage working with back pain.* ***NGT 1***	*None: Individuals do activities they can manage to do with back pain. If pain is severe then one can have bed rest.* ***NGT 1***
3. Back pain is a personal responsibility; it is up to you to look after your back	*It is a personal responsibility because you consider the tasks and decide to ask for help, nobody can force you.* ***NGT 2***	It is a clear message	Maintained	*People look at you as sluggish when you are not performing certain tasks because of back pain* ***NGT2***	None
4. X-rays are not useful to detect the cause of back pain	*It is not necessary to take x-rays. It is not that whenever one has backache that there is something wrong* ***NGT 2***	*It is a clear message; other nurses will have a similar understanding* ***NGT 2***	Maintained	*X-rays are not part of our culture* ***NGT 2***	None
5. Surgery is not the answer for back pain	*It is not necessary; you need surgery for back pain. You may just need hot or cold compress. Surgery must be the last course of action when there*	*Other nurses will have a similar understanding* ***NGT 3***	Maintained It's a clear message	No factors reported	None

	is something serious. ***NGT 3***				
6. Avoid taking unnecessary pain killers when you have back pain; there is a lot you can do to help yourself.	*It is not very necessary take Panadol every day. We may need to consider other options like my posture when am working to help with back pain* ***NGT 3***	*Their understanding will be in line with what has been said here* ***NGT 3***	Maintained	*It depends on the individual and severity of pain.* ***NGT 3***	*Pain is understood to be a unique individual specific experience* ***NGT 3***
7. Back pain usually gets better over time	*Back pain becomes manageable overtime.* ***NGT 1***	*It is a clear message and understanding will be similar* ***NGT 1***	Maintained	*There are no cultural/lifestyle issues* ***NGT 1***	None

5.2.4 Participants' voting of their five most important back pain messages

Table 15 shows participant's voting of the back pain campaign messages. The five messages (1, 2, 3, 4, and 6) that were considered the most important are highlighted and shaded in the table.

Table 15: Participants' voting of five (5) most important back pain messages

No	Messages	Frequency	%
1	Back pain is rarely caused by a dangerous illness	25	69.4%
2	The key to feeling better sooner is to stay active	24	66.7%
3	Back pain is a personal responsibility, it is up to you to look after your back	25	69.4%
4	Surgery is not the answer for back pain	24	66.7%
5	X-rays are not useful to detect the cause of back pain	19	52.7%
6	Avoid taking unnecessary pain killers when you have back pain; there is a lot you can do to help yourself.	28	77.7%
7	Back pain usually gets better over time	16	50%

5.3 SECTION 2 CAMPAIGN DESIGN

Once the content (selection of priority key messages) of the campaign was affirmed, the intervention was designed. The intervention design is outlined in the second section of this chapter.

5.3.1 Aim

The aim of this section is to describe the procedures followed to ensure a collaborative approach in the design of the intervention.

5.3.2 Setting and participants

The process conducted to select the five priority key messages for the Zambian nurses is described in the first section of this chapter. Thus, the same participants and setting as described in the first section of this chapter also applied to this section. The researcher facilitated a discussion on the design of the campaign, with input from the supervisors. The stakeholders were not part of the campaign design directly, but their ideas were incorporated in the campaign following the NGT described in Section 1 of this chapter.

5.3.3 Procedures

During the NGT described participants were asked about their preferences for the delivery mode of the interventions and the following options were extracted from the white board discussion and deliberated. These propositions are also in line with the findings of the systematic review (Chapter 2):

1. Posters
2. Stickers on the doors
3. Pamphlets
4. Flyers
5. Workplace visits and workshops
6. Clinical presentations
7. Health education talks
8. Drills and demonstrations
9. WhatsApp nurse's forum
10. Radio and television programmes

Table 16 shows the stakeholder preferences about the delivery modes of the intervention. The researcher predicted that pamphlets and flyers could be reduced to waste because they were often discarded once they had been read. Hence, posters and stickers were the preferred modes.

Furthermore, considering the contents of the messages it was agreed that the WhatsApp nurse's forum be used instead of the drills and demonstrations. Since the messages were informative and did not require any practical skills, they were used instead of radio and television programmes that were outside of the research budget.

Table 16: Stakeholder preferences about the delivery modes of the intervention

Initial suggestions	Preferred modes based on suggestions
1. *Posters* 2. *Stickers (door, trolley, bp-machine)* 3. *Pamphlets* 4. *Flyers* 5. *Workplace visits and workshops* 6. *Clinical presentations* 7. *Health education talks* 8. *Drills and demonstrations* 9. *WhatsApp nurse's forum* 10. *Radio and television programmes*	1. Posters 2. Stickers on the doors 3. Health education talks/ Clinical presentations 4. WhatsApp nurses' forum

Following on from the discussion on delivery modes, participants proposed clinical presentations/ health education talks. This is because the system already had in place weekly grand rounds and clinical meetings in which the presentations could easily fit. To complement the delivery modes the researcher included souvenir mug cups and pens which were branded with the key messages.

5.4 DESCRIPTION OF THE CAMPAIGN

The campaign intervention aimed to change unhelpful beliefs regarding back pain, promote back health, increase knowledge on back pain, and enhance participants' self-management skills of back pain experiences. Based on the information that was obtained from the NGT discussions, the wording for each message was confirmed and the Template for Intervention Description and Replication (TIDieR) checklist and guide (Hoffmann et al., 2014) was used as a framework to design and describe the intervention (Appendix I).

5.4.1 Description of the intervention

This was a self-management education campaign for back pain for nurses in Lusaka, Zambia. Revised and clearly written back pain messages were conveyed to participating nurses using PowerPoint presentations, posters, BP machine stickers, door stickers, branded pens and branded mug cups. In addition, drama and WhatsApp messaging videos were incorporated as methods of message delivery. The messages which were conveyed included: “avoid taking unnecessary pain killers when you have back pain”; “there is a lot you can do to help yourself”; “back pain is a personal responsibility, it is up to you to look after your back”; “back pain is rarely caused by a dangerous illness”; “the key to feeling better sooner is to stay active”; and “surgery is not the answer for back pain”.

5.4.2 Where?

The campaign was at Chilenje, Chawama, Chingwere and Kanyama first government hospitals located in the peri-urban areas of Lusaka. The hospitals operate at district level under the management of the Lusaka District Health office.

5.4.3 How was the intervention started?

After completion of the permission formalities, the campaign commenced with, face-to-face interactions and information sessions, where sketches and power point presentations were presented, to nursing staff at the participating centres. As a result of shift work and the need to continue with work routines in the various hospital units, not all the nurses could be in one sitting at the same time. Thus, face-to-face interactions were done in groups of approximately thirty (30) nurses. Branded materials which included posters and stickers were distributed and placed in strategic but visible places such as nurses’ tea rooms, treatment rooms and offices. The materials were preserved throughout the campaign. To maintain the mood, one of the scheduled WhatsApp messaging videos on the key back pain messages was conveyed to the participants at least once every two days.

5.4.4 Who provided the intervention?

The researcher who is a physiotherapist, clinical epidemiologist and public health specialist provided the intervention and was assisted by two other physiotherapists who have acquired master’s degrees in orthopaedic physiotherapy and public health. The hospital senior medical superintendents and the nursing managers were key people to the success of the campaign and

were engaged to help drive the programme at hospital level. At ward level, it was the sisters-in-charge officers who were engaged as campaign champions.

5.4.5 Modes of delivery

Modes of delivery for the campaign materials included face-to-face interactions where talks and drama presentations on back pain and self-management education were made to the participants. Posters, stickers, WhatsApp video messages (one message was conveyed twice a week), branded mugs and pens were other mediums that were used to convey the back-pain campaign messages to the participants. These materials were provided to the participants at individual and group levels during the intervention period. For instance, mugs were placed in the nurse's tearooms as a method of reminding them about the back campaign each time they used them, and each participating nurse was given a pen while a few pens were placed at the nurse's desk.

A graphic designer was contracted to design the images and visual presentation of the campaign material. Illustration of the design on the campaign materials (mugs, pens, etc.) with the cross-culturally validated and adopted key back pain messages is shown in the figures 9, 10 and 11 below.

Figure 9: Samples of the posters with the key messages

Figure 10: Mugs and pens

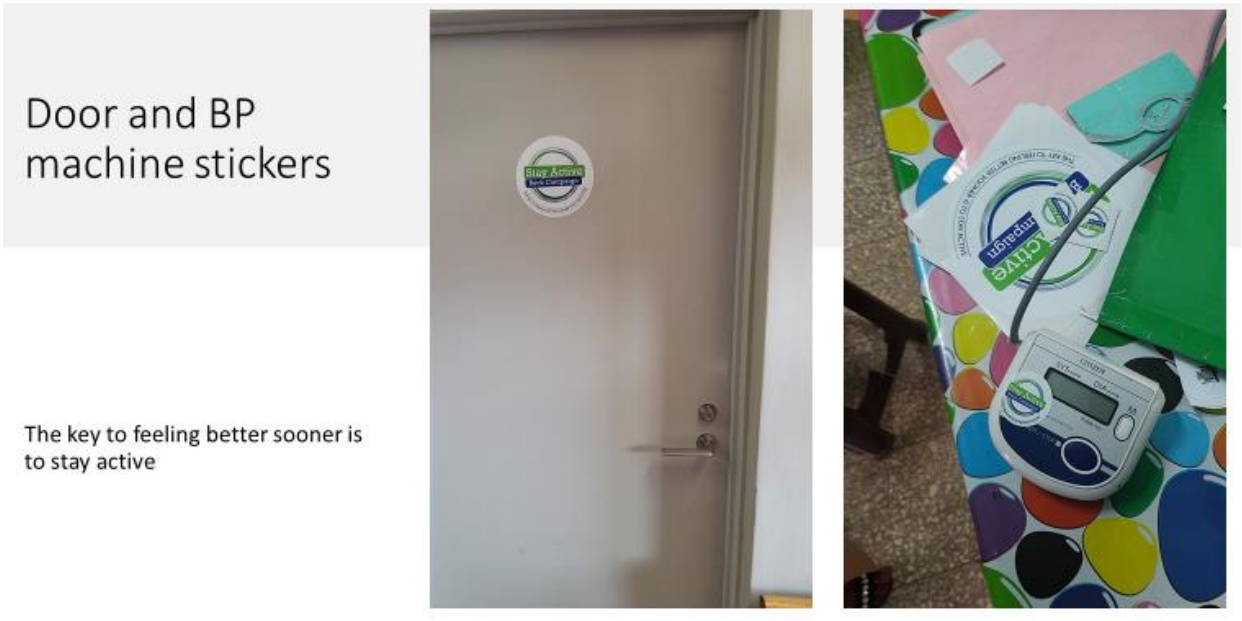

Figure 11: Door and BP machine stickers

Face-to-face presentations at the workplace: the contents of the PowerPoint presentations (Appendix M) comprised information that had been adapted from the Lancet 2018 series on back

pain (Hartvigsen et al., 2018) and highlights the key messages on the back-pain campaign for nurses in Zambia. The presentation was given to the nurses at the start of the campaign at each centre. Figure 12 below displays pictures during the power point presentations at Chawama Level One hospital in Lusaka, Zambia. (Permission to use the images in the dissertation report was obtained from the participants during consent formalities).

Figure 12: Power point presentations

The drama: during the opening ceremonies, the drama was performed for entertainment but at the same time was used to deliver vital information on back pain and incorporated the revised messages for back pain (Appendix J). The scripts were written by the researcher in collaboration with the Chilenje Hospital peer educators' group who performed the drama at each centre during face-to-face interactions. Below (Figure 13) is a picture taken during the drama session. (Permission to use the images in the research report was obtained from the participants during consent formalities)

Figure 13: Drama session

The WhatsApp video messages: The researcher designed and recorded were five PowerPoint short video messages with voice over for each key message. The background of the PowerPoint video messages included the poster designs for each key message (Appendix N). Each week one message from the five was randomly selected and conveyed to the participants once every second day during the campaign period.

5.4.6 When and how much

The talks and drama were once-off activities at the commencement and launch of the campaign at each centre. Educational material (posters, stickers, mugs and tags) were distributed in strategic places such as the nurses' Tea room after the launch of the campaign and were maintained throughout the three (3) months intervention period. WhatsApp messages were conveyed to the participants at least once every two days to maintain the campaign mood. Figure 14 illustrates the intervention flow.

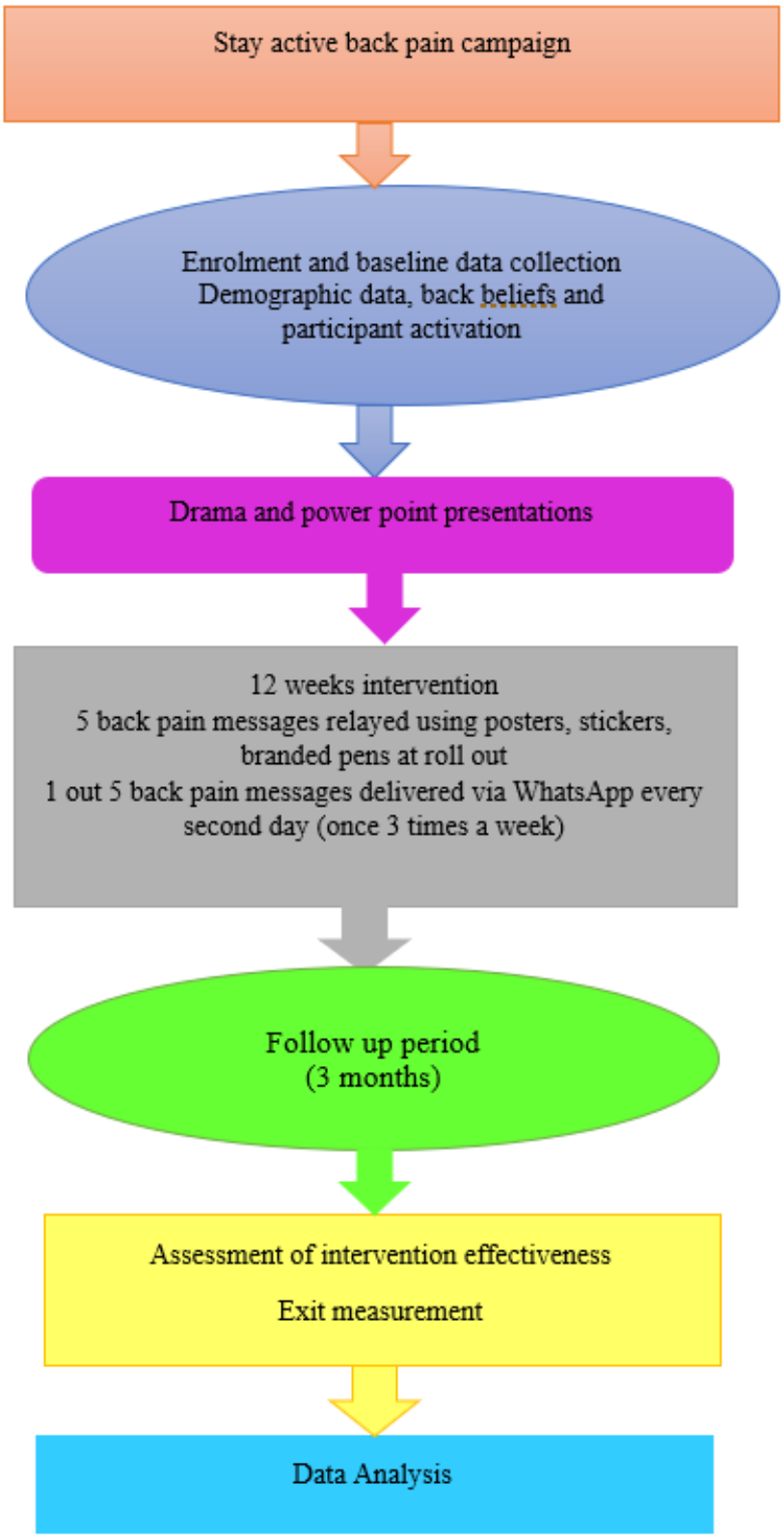

Figure 14: Schematic flow diagram of the intervention

5.4.7 Tailoring and modifications

From commencement there were no modifications or tailoring made to the intervention.

Table 17 shows the overview of the campaign design, the contents, and methods. It also exemplifies the implementation activities and modes of delivery.

Table 17: Intervention design summary table

Intervention design			
Messages	**Content synthesis**	**Revision**	**Agreement**
1. Back pain is rarely caused by a dangerous illness 2. The Key to feeling better sooner is to stay active 3. Back pain is a personal responsibility (it is up to you to look after your back) 4. Surgery is not the answer for back pain 5. Avoid taking unnecessary painkillers for back pain (there is a lot you can do to help yourself).	Systematic review (SR)	FGDs	NGT
Design (self-management back pain campaign)	**Content & Source**	**Period**	
TIDIER framework	SR & FGDs	Three (3) Months	
Activities and pragmatics	**Content & Source**	**Frequency**	**Agreement**
Clinical presentation	SR	Once off	FGDs
Drama activities	FGDs	Once off at start	
WhatsApp messages	SR &FGDs	1/5 message 3 times a week	
Poster and sticker presentations	SR &FGDs	Throughout campaign	
Implementation/ roll out			
Target audience	Nurses at Chilenje, Chawama, Chingwere and Kanyama level one hospitals		
Goal	Encourage staying at work and active even with back pain. Develop positive attitudes and back pain beliefs		
Benefits	Improved fitness and reduced absenteeism		
Key message	Stay active with back pain		
Media to reach audience	Posters, door stickers, WhatsApp, drama, clinical talks, branded pens and mug cups		
Persons responsible	Principal researcher and assistants		
Evaluation			
Participant activation, back beliefs, intervention programme	Participant activation and back beliefs questionnaires interviews		

5.5 CHAPTER SUMMARY

This chapter aimed to obtain consensus and priority on the key messages and design of the intervention. Thirty-six (36) participants took part in the study. Most (83.3%) were female and the participants' common age group was 31-40 years.

All participants agreed with the contents of the key messages. Only one message, "stay active, continue working and exercising with back pain, it is key to getting better soon," was rephrased for clarity following the NGT discussion. It was rephrased to, "the key to feeling better sooner is to stay active". The five most prioritised messages included:

1. Back pain is rarely caused by a dangerous illness
2. The key to feeling better sooner is to stay active
3. Back pain is a personal responsibility (it is up to you to look after your back)
4. Surgery is not the answer for back pain
5. Avoid taking unnecessary painkillers for back pain (there is a lot you can do to help yourself).

The Template for Intervention Description and Replication (TIDieR) checklist and guide was used to describe the intervention methods. The focus of the intervention was to change unhelpful perceptions of back pain, promote health, increase knowledge on back pain and enhance participants' self-management skills of back pain experiences. Clearly written back pain messages were conveyed to participating nurses using power point presentations, posters, BP machine stickers, door stickers, branded pens and branded mugs. In addition, WhatsApp messaging videos were incorporated as methods of transmission.

Declaration by the candidate

Nkhata, L. A., Brink, Y., Ernstzen, D., & Louw, Q. A.

Selection of priority back pain messages and intervention design

Regarding chapter 5, the nature and scope of my contribution were as follows:

Author	Email-address	Nature of contribution Extent of contribution	Percentage (%)	Signature
Loveness A. Nkhata	Lnkhata@yahoo.com	Study conception and design: acquisition of data; analysis and interpretation of data; drafting of manuscript and critical revision.	80%	
Prof. Quinette A. Louw	qalouw@sun.ac.za	Supervisory role: conception and drafting, critical revising for important intellectual content and final approval of the version to be submitted.	10%	
Dr Yolandi Brink	ybrink@sun.ac.za	Supervisory role: analysis and interpretation of data; drafting of chapter, critical revision and proofreading it.	5%	
Dr Dawn Ernstzen	dd2@sun.ac.za	Supervisory role: revising it critically for important intellectual content	5%	

CHAPTER SIX

The effects of a cross-culturally validated back pain campaign on back beliefs, coping strategies and participant activation for nurses in Lusaka, Zambia.

The effects of a cross-culturally validated back pain campaign on back beliefs, coping strategies and participant activation for nurses in Lusaka, Zambia which was designed in study 2 is presented in this chapter. Figure 15, shows the schematic layout of the structure of chapter 6 in the dissertation

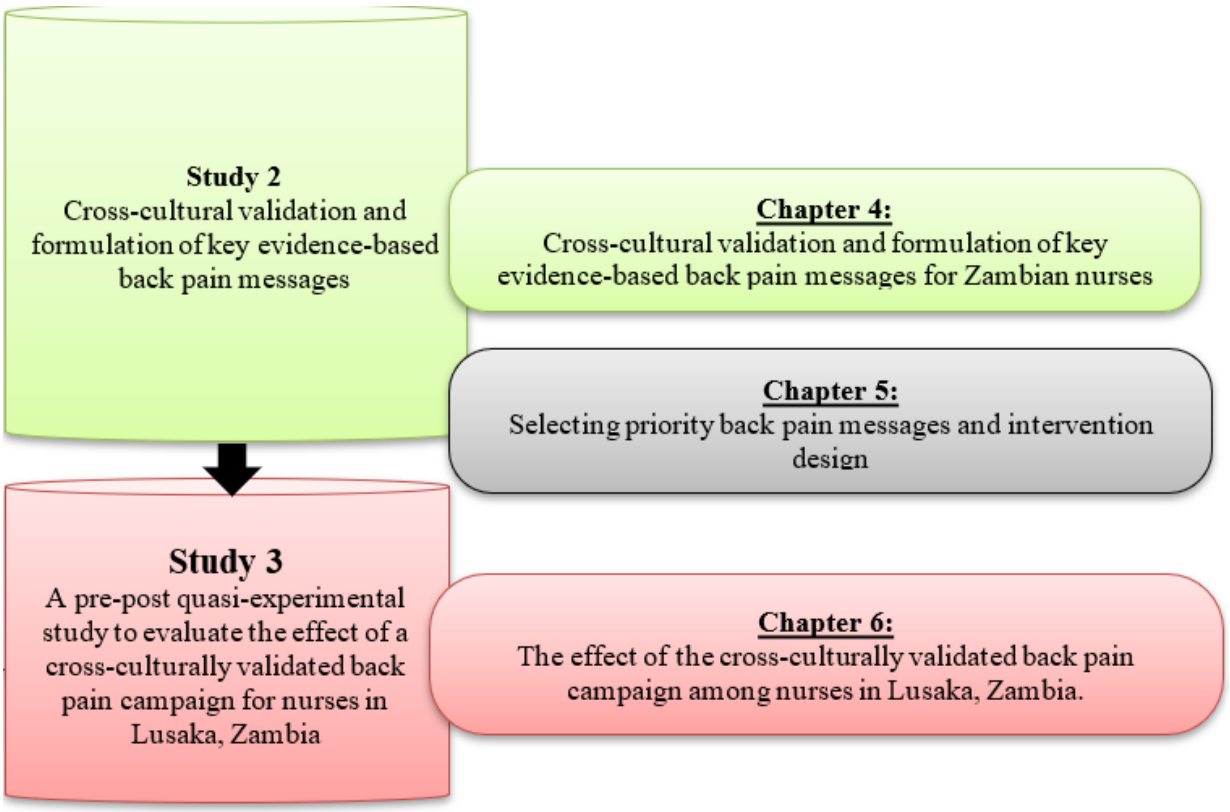

Figure 15: Schematic layout of the structure of chapter 6 in the dissertation

6.0 AIM

To evaluate the effects of the back pain campaign among nurses in Zambia.

6.1 OBJECTIVES

To assess the effects of the back pain campaign on:

- participant activation for self-management,
- back pain back beliefs,
- coping strategies and,
- sick leave and frequency of doctor visits days.

6.2 MATERIALS AND METHODS

6.2.1 Study design

This was a pre-post quasi-experimental design. A quasi-experimental design is non-randomised and is used when it is not ethically feasible to conduct a randomised control trial (RCT) or when there are logistical constraints (Harris et al., 2006). The key concerns included cross-contamination between hospitals due to the nature of the intervention as the participating hospitals were located relatively close to each other. In addition, there are only four level one public hospitals within this region and using hospitals in other regions (e.g. semi-urban or rural) would not have been comparable due to differences in the type and level of care, intensity of services and resources such as staff capacity. Furthermore, using a control group from another region may also have introduced known and unknown confounding factors which may have been difficult to consider during analyses. The researcher chose this design based on the methods used in similar campaigns (Hoy et al., 2010; Werner et al., 2008; Buchbinder et al., 2008; Waddell et al., 2007). In addition, the design was useful in generating results for general trends and reduced the time and resources needed for experimentation. Furthermore, the design helped to highlight the impact and benefits of the intervention in the target population because the design used pre- and post-intervention measurements (White & Sabarwal, 2014: Harris et al., 2006).

6.2.2 Settings and location

The study was conducted in Lusaka**,** Zambia, at Chawama, Chelstone, Chingwere, Chilenje and Kayama first level hospitals. Lusaka houses government hospitals which operate at district and tertiary levels. The study sites are government hospitals which operate at district level under the management of the Lusaka District Health office (LDHO) and are in the peri-urban areas of Lusaka

to service their catchment areas. The hospitals provide various health services and public health programmes at community level, such as interventions for common conditions including maternal and child health, HIV and AIDS, tuberculosis, water sanitation and malaria (LDHO, 2017). The hospitals were purposefully chosen as study sites because they are similar in operation level and system compared to the other centres. In addition, they have a good road network system and are easily accessible.

6.2.3 Sample size and sampling method

The study population comprised all nurses who were working in level one public health facilities regardless of whether they had or did not have back pain at the time of data collection. In accordance with literature (Richardson et al., 2019; Gim, 2017) most nurses experience back pain at some point of their adult life; thus, the main outcomes were appropriate for all nurses, irrespective of pain at the time of the study. There are four level one public health facilities in Lusaka and approximately 460 serving nurses in total at all four facilities (LDHO, 2018). These facilities provide health services to both in and outpatients including public health programmes at peri-urban community level (LDHO, 2018). A population sampling method was adopted as all four level one institutions in Lusaka were enrolled in the study. One of the hospitals which is on the outer grid than the others (Chelstone) was used as a pilot.

The principal nursing officer's registers were used to identify and recruit registered nurses, enrolled nurses, midwives, public health nurses, theatre nurses and nurse managers who were available and serving in the various departments at the time of data collection. The participant eligibility criteria comprised enrolled nurses, registered nurses, and nursing managers from level one public health facilities in the peri-urban areas of Lusaka. In addition, the campaign targeted all nurses and not only those with back pain at the time of the study. This is in accordance with literature which shows that most nurses will experience back pain at some point of their adult life. The main outcomes are thus appropriate for all nurses, irrespective of pain at the time of the study.

6.2.4 Intervention description

The Zambian back pain campaign for nurses comprised the revised (Chapter 4) key evidence based back pain messages of back pain. The goal was to provide information and education, aimed at changing unhelpful and incorrect perceptions of back pain which may be associated with poorer outcomes and increased burden on the healthcare system, promoting health, increasing knowledge on back pain and enhancing the participants' self-management of back pain disabilities.

6.2.5 Mode of delivery and materials

As highlighted in chapter 5 the back pain messages were conveyed to participating nurses using power point presentations, posters, BP machine stickers, door stickers, branded pens, branded mug cups and WhatsApp videos (see 5.4.5 in Chapter 5, Sections 2).

6.2.6 Data collection instruments

A self-administered instrument, based on a compilation of existing validated questionnaires (back beliefs questionnaire and participant activation measures), was used to collect data on back pain history, back beliefs, and participant activation for self-management of back pain. All items on back beliefs and participant activation were adopted from the Back Beliefs Questionnaire (Dupeyron et al., 2017; Bostick et al., 2013) and the Patient Activation Measure (Hibbard & Gilburt, 2014; Insignia Health, 2013).

The Participant Activation Measure is validated for assessing patient engagement in the management of chronic conditions such as back pain. It contains 13 item statements to which the participants indicate their level of agreement on a four-point scale from "strongly disagree" to "strongly agree" (Hibbard & Green, 2012). The responses give a raw score from 13 which is calibrated to a total score of between 0 and 100 (Insignia Health, 2017). A high score indicates that the participants are more activated to adopt and maintain healthy behaviours and self-management of their condition (Hibbard & Green, 2012).

The Back-Belief Questionnaire (BBQ), measures attitudes and beliefs about back pain (Bostick et al., 2013). The questionnaire has 11 statements on a 5-point scale (1=agree to 5=disagree) and

respondents indicate their degree of agreement with each of the statements. A higher score indicates a more positive belief about low back pain, suggesting better ability to cope with low back pain. The psychometric properties for both these questionnaires have been validated and used in the general public in similar studies (Gross et al., 2010; Waddell et al., 2007; Werner et al., 2007) and are appropriate for people with or without tertiary education. Therefore, it was considered to be valid for nurses who had a tertiary level of education.

6.2.7 Piloting of instruments

To assess intent (understanding) of the questionnaire items, it was piloted among twenty conveniently selected nurses at one of the non-participating public health facilities (Chelstone Hospital). The results of the pilot study indicated that participants had the ability to comprehend the instructions and understand the questionnaire items, sequence of questions and the flow of statements. Time taken (10-15 mins) to complete the questionnaire (BBQ and participant activation) was observed and any typographical errors on the format, font and layout of the questionnaire were noted and corrected.

6.2.8 Data collection and procedure

To accomplish the study objectives, demographic data, and participants' back pain history was collected in section A, participants' back beliefs in section B and data on participant activation for self-management of back pain in section C. Questionnaires for exit data collection were distributed among nurses for completion after week twelve of the intervention at each facility between 2 April 2020 and 14 June 2020. Because of the COVID-19 pandemic challenges and restrictions, exit data collection lasted much longer than planned. Approximately three to four weeks was spent at each facility to complete exit data collection. The questionnaire was semi-structured and self-administered which made it feasible for the participants to complete it during their free time. However, the researcher and two research assistants were frequently on site and available to attend to any challenges.

6.2.8.1 Hospital approval

Approval for each participating facility was obtained from the medical superintendents after clearance from the National health Research Authority (NHRA) and the Lusaka District Health Office (LDHO)

6.2.8.2 Procedure for consent

Informed consent was obtained from all participants before commencement of baseline data collection. Participants were assured of confidentiality; no names were used, instead questionnaires were allocated serial numbers which were used for data entry.

6.2.9 Data analysis and outcome measures

Demographic data was summarised using descriptive statistics in Stata version 20.0 for windows. Characteristics of back beliefs, participant activation measures and coping strategies were described using relative frequencies and percentages. To assess the effect of the intervention on back beliefs and participant activation, the chi-square test at 5% statistical significance level was used. Total sums for before and after sick leave, doctor visits, back beliefs and participants' activation were also compared. A decrease in the number of individuals obtaining sick leave and doctor visits after the campaign was considered as a positive effect of the intervention. An increase in the number of individuals answering appropriately in the back beliefs and agreeing with the statements in the participants' activation measures, was considered as a positive effect of the campaign.

6.2.10 Approval for ethics and health authorities

Ethical approval and clearance for this study was obtained as part of a bigger project entitled "The effectiveness of a contextualised back pain campaign for nurses in Lusaka, Zambia", from the Stellenbosch University Health Research Ethics Committee (Reference #: S18/06/125s; Project ID:7431); the University of Zambia Health Sciences Research Ethics Committee (Protocol ID: 20181016002), the National Health Research Authority, the Lusaka District Health Office and the participating Health Centres. Informed consent was also obtained from individual participants before data collection.

6.3 RESULTS

6.3.1 Participants' demographic descriptions

Table 18 presents pre- and post-demographic data characteristics of participants who participated in the study. At baseline there were 327 participants and 325 at the end of the study. The majority of the participants, 68.5% (before) and 68.7% (after), were female. The common age group for before (38.5%) and after (39.0%) was 26-35 years. Inter-quartile range (IOR) for number of work hours per week was 40 before and after the campaign.

Table 18: Participants' demographic descriptions

Participants' demographic descriptions		Before n (%)	After n (%)
Age	18-25	117 (35.7)	125 (38.4)
	26-35	126 (38.5)	127 (39.0)
	36-45	75 (22.94)	65 (20.0)
	46-60	9 (2.5)	8 (2.4)
Gender	Male	103 (31.5)	102 (31.2)
	Female	224 (68.5)	224 (68.7)
Work setting	Medical	118 (36.8)	53 (16.5)
	Paediatric health	55 (17.9)	28 (8.7)
	Theatre	14 (4.3)	41 (12.7)
	Surgical	6 (1.8)	32 (9.9)
	Maternity	49 (15.3)	48 (14.9)
	OPD	62 (19.3)	113 (35.2)
	Others	16 (5)	6 (1.8)
Work hours	Mean (SD)	36.31 (11.15)	37.59 (4.38)
	Median (IQR)	40 (6)	40 (4)
Years of professional experience	Mean (SD)	4.14 (7.06)	6.56 (6.09)
	Median (IQR)	2 (4)	4 (8)

6.3.2 Participants' back pain history

As seen in table 19, the number of individuals who reported back pain in the last two months before the campaign reduced to 25.6% (80) after the campaign, compared to 58% (126) before the intervention. There was also a reduction in the number of individuals who obtained sick leave due to back pain, from 34% (84) before to 21.5% (59) after. Likewise, the number of back pain leave days obtained also reduced; for instance, 1-3 days sick-leave days reduced from 91.8% (124) to 23.7% (75).

Table 19: Participants' back pain history

Participants' back pain history		**Before**	**After**
Back pain experience	2 years	28 (12.9)	132 (42.4)
	12 months	63 (29.0)	99 (31.8)
	Last 2 months	126 (58.0)	80 (25.6)
Number of back pain days	1-3 days	109 (53.7)	124 (91.8)
	4-7 days	70 (34.15)	11 (8.0)
	Over 2 weeks	26 (12.68)	1 (0.74
Sick leave due to back pain	Yes	84 (34.0)	59 (21.5)
	No	163 (65.9)	220 (78.8)
Number of sick-leave days	1-3 days	124 (91.8)	75 (23.7)
	4-7 days	11(8.0)	3 (3.7)
	Over 1 week	1 (0.74)	2 (2.5
Number of doctor visits	Mean (SD)	1.71 (0.96)	0.46 (0.67)
	Median (IQR)	1(1)	0 (1)

6.3.3 Participants' back beliefs measures

Items within the back beliefs questionnaire (Table 20) shows that seven (Q13, 16, 19, 23, 24, 25 and 26) out of fourteen questions showed a positive trend when more people answered correctly after the campaign, albeit the p-values were insignificant. Surprisingly, participants answered inappropriately and displayed a negative trend to items in Q15, Q17 and Q22. It's the latter questions which are related to Q25 which had a positive trend after the campaign.

Table 20: Items within the back beliefs questionnaire (BBQ)

Question	Correct before campaign N (%)	Correct after campaign N (%)	P-value	Total responses (included answered incorrectly)
Q13 There is no real treatment for Back pain	107 (36.4%)	**201 (68.8%)**	0.66	292
Q14 Back pain will eventually stop you from working	118 (37.8%)	97 (31.0%)	0.94	312
Q15 Back pain means periods of pain for the rest of one's life	221 (70.1%)	175 (55.5%)	0.85	315
Q16 Doctors cannot do anything about back pain	36 (11.3%)	79 (25%)	0.68	316
Q17 A bad back should be exercised	242 (79.2%)	205 (66.3%)	0.31	309
Q18 Back pain makes everything worse in life	117 (38.6%)	94 (31.0%)	0.49	303
Q19 Surgery is the most effective way to treat back pain	264 (85.9%)	**290 (94.4%)**	0.09	307
Q20 Back pain may mean you will end up in a wheelchair	230 (75.1%)	225 (73.5%)	0.57	306
Q21 Alternative treatments are the answer to back pain	196 (63.2%)	124 (40%)	0.32	310
Q22 Back pain means lengthy periods of time off work	168 (54.5%)	133 (43.1%)	0.09	308
Q23 Medication is the only way of relieving back pain	181 (59.1%)	**286 (93.4%)**	0.14	306
Q24 Once you have had back pain there is always a weakness	137 (45.8%)	**190 (63.5%)**	0.46	299
Q25 Back pain must be rested	27 (8.7%)	**95 (30.9%)**	0.31	307
Q26 Later in life back pain gets progressively worse	74 (23.6%)	**111 (35.4%)**	0.71	313

6.3.4 Participant activation measures

Items within the participants' activation measure (Table 21) demonstrates that all eleven enquiries showed a more positive trend when more people agreed with the statements after the campaign

even though the p-values were insignificant. The biggest changes in the proportion of participants who showed a positive trend are noted in questions Q27 (88.6%), Q28 (88.8%), Q29 (90.6%), Q30 (89.9%), Q32 (89.8%), Q35 (89.1%) and Q36 (92.2%)

Table 21: Items within the participant activation measure

Items within the participant activation measure	Agreed before campaign N (%)	Agreed after campaign N (%)	P-value	Total responses (included disagreed and neutral
27. When all is said and done, I am the person who is responsible for managing my back	187 (60.7%)	**273 (88.6%)**	0.21	308
28. Taking an active role in my back care is the most principal factor in determining my health and ability to function	182 (57.9%)	**279 (88.8%)**	0.19	314
29. I am confident that I can take actions that will help me prevent or minimise some symptoms or problem associated with back pain	185 (59.6%)	**281 (90.6%)**	0.48	310
30. I am confident that I can tell when I need to get medical care and when I can handle back pain myself	160 (53.6%)	**268 (89.9%)**	0.96	298
31. I am confident that I can follow through on medical advice and treatment I need to do at home for back pain	193 (63.2%)	**239 (78.3%)**	0.23	305
32. I understand the nature and causes of back pain	136 (45.9%)	**266 (89.8%)**	0.80	296
33. I know the different treatment options available for back pain	116 (40.9%)	**243 (85.8%)**	0.24	283
34. I have been able to maintain the lifestyle changes for back pain that I have made	127 (43.4%)	**247 (84.5%)**	0.51	292
35. I know how to prevent further problems with back pain	120 (42.1%)	**254 (89.1%)**	0.67	285
36. I am confident I can figure out solutions when problems with back pain arise	132 (46.3%)	**263 (92.2%)**	0.85	285
37. I am confident that I can maintain lifestyle changes like diet and exercise even during the times of back pain	132 (44.7%)	**259 (87.7%)**	0.76	295

6.3.5 Participants' coping strategies for back pain experiences

Outcomes for participants' coping strategies for back pain experiences show a positive trend following the campaign. As displayed in table 22, participants who reported use of pain medication reduced from 81.6% (267) to 38.7% (126) after the campaign and those reporting exercise and physiotherapy activities increased to 34.2% (111) from 26.5% (87) after the campaign. The biggest change in the proportion of participants who showed a positive trend is noted in the use of pain

medication as a coping strategy from 267 (81.6%) before the campaign to 126 (38.7%) after the campaign.

Table 22: Participants' coping strategies

Coping strategies for back pain		
	Before N (%)	**After N (%)**
Pain medication	267 (81.6%)	126 (38.7%)
Bed rest	117 (35.9%)	85 (26.2%)
Exercise and physiotherapy	87 (26.5%)	111 (34.2%)

6.4 PARTICIPANTS' FEEDBACK ON CAMPAIGN

Feedback on the campaign highlighted that almost all participants (96.3%) were happy with the back pain campaign for nurses in Zambia. In addition, 95.9% reported that the campaign influenced their back care goals, coping skills and recommended that the campaign activities be conveyed to other health facilities. Furthermore, most of the participants submitted that they were satisfied with the campaign facilities and materials (Table 23).

Table 23: Participants' feedback on campaign

Question	**Yes (%)**	**No (%)**	**Total**		
Are you happy with the back campaign for nurses in Lusaka, Zambia?	**312 (96.30%)**	**12 (3.7%)**	**324**		
Do you see this as having an impact on you back care goals?	**313 (95.9%)**	**11 (4.1%)**	**324**		
Would you recommend this campaign to other facilities?	**304 (99.3%)**	**2 (0.65%)**	**306**		
Campaign facilities and materials	**Very unsatisfied**	**Unsatisfied**	**Neither**	**Satisfied**	**Very satisfied**
Facilities for presentation	1 (0.3%)	15 (4.6%)	16 (4.9%)	221 (68.4%)	70 (21.6%)
Posters and stickers	3 (0.9%)	15 (4.6%)	10 (3%)	188 (58%)	108 (33.3%)
WhatsApp videos	5 (1.6%)	40 (12.4%)	18 (.6%)	160 (49.8%)	98 (30.5%)
Mugs and pens	10 (3.12%)	22 (6.8%)	17 (5.3%)	155 (48.2%)	117 (36.4%)
Quality of campaign materials	4 (1.2%)	19 (5.8%)	11 (3.4%)	176 (54.3%)	114 (35.1%)

6.5 CHAPTER SUMMARY

The objectives of this study were to evaluate the effects of the back pain campaign on back beliefs, coping strategies and participant activation for self-management of back pain among nurses in Lusaka, Zambia. In addition, it was to measure the ratio of sick-leave days and frequency of doctor visits due to back pain as secondary outcomes. A self-administered instrument, based on compilation of existing validated questionnaires (back beliefs questionnaire and participant activation measures), was used to collect data on back pain history, back beliefs, and participant activation for self-management of back pain in a pre-post quasi-experimental study.

Beliefs are modifiable and are an important strategy in the management of back pain (Carneiro, Bunzli & O'Sullivan, 2020; Søren et al., 2019). Hence, addressing negative beliefs and knowledge about pain through education is key because it helps to change awareness, reduces disability, and enhances coping in individuals with back pain. Even, though statistical values were insignificant after the campaign, positive trends were observed in all the outcomes measures. Participants' management and coping strategies for back pain reported in this study were equally linked to their informed back pain beliefs. Consequently, self-management campaigns about back pain in nurses have the potential to influence a better understanding of back pain and to ensure a better management of back pain symptoms among nurses.

Self-management is an integral part of back pain management (Burd & Hallsworth, 2017) because ultimately, it promotes health and function. Thus, in a workplace, activity interventions such as back pain campaigns are seemingly beneficial in reducing the chances of back pain disabilities especially among female nurses. The reassurance and advice for self-management of pain helps increase confidence and self-efficacy to better cope with future pain experiences, as shown by the positive trends and encouraging feedback obtained.

Declaration by the candidate

Nkhata, L. A., Brink, Y., Ernstzen, D., & Louw, Q. A.

The effect of the back pain campaign among nurses in Lusaka, Zambia

Regarding chapter 7, the nature and scope of my contribution were as follows:

Author	Email-address	Nature of contribution Extent of contribution	Percentage (%)	Signature
Loveness A. Nkhata	Lnkhata@yahoo.com	Study conception and design: analysis and interpretation of data; drafting of chapter and critical revision.	80%	
Prof. Quinette A. Louw	qalouw@sun.ac.za	Supervisory role: conception analysis and interpretation of data, critical revising for important intellectual content and final approval of the version to be submitted.	10%	
Dr Yolandi Brink	ybrink@sun.ac.za	Supervisory role: critical revision and proofreading it.	5%	
Dr Dawn Ernstzen	dd2@sun.ac.za	Supervisory role: critical revision and proofreading it.	5%	

CHAPTER SEVEN

7.1 DISCUSSION

The overall aim of this study was to assess the effects of a cross-culturally validated back pain campaign for nurses in Lusaka, Zambia. To accomplish the overall aim three interlinked studies with different methodologies, but all based on the principles of evidence were conducted. The specific objectives of these studies were to retrieve and synthesise the contents of back pain messages, their mode, duration, and the effectiveness of the campaigns. In addition, to ascertain context factors that could influence the understanding of the back pain messages, their uptake and the designing of the campaign.

7.1.1 Effects of the Zambian back pain campaign

The effects of the back pain campaign were evaluated on back-pain beliefs and participant activation for self-management of back pain among nurses in Lusaka, Zambia (see Chapter 6). The findings of the Zambian campaign showed no statistically significant differences in the BBQ and participant activation measures observed for back beliefs and participant activation after the campaign, although many of the questions showed positive trends after the campaign. Since we collected categorical data, chi-squared tests which are very sensitive to sample size, were conducted. Usually, any sample that is less than ~500 may appear statistically insignificant (Bergh, 2015) and this may be one of the reasons why the findings were not statistically significant albeit positive trends were noted.

The key outcome for our Zambian campaign was patient activation measures where positive trends were observed in all eleven items when more participants agreed with the statements after the campaign. Worth noting also are the significant changes that occurred in the number of sick leave days due to back pain and the number of doctor visits which decreased significantly after the campaign. These were objective measures that may be related to the impact of the intervention. Participants baseline beliefs and coping strategies were good enough when compared to studies which were conducted in the general population (Buchbinder et al., 2008; Werner et al., 2007; Waddell et al., 2007). This maybe because the population of nurses are healthcare professionals who may have had adequate knowledge about back pain compared to those in the general population.

These outcomes means that the back campaign can successfully be used to influence attitudes towards back care goals and promote healthy behaviours in different populations. Likewise, the Australian campaign (Buchbinder et al., 2008) showed that the campaign could be successfully used to influence population attitudes, beliefs, and health risk behaviours. Similarly, in Scotland (Waddell et al., 2007) the campaign resulted in a significant shift in public beliefs regarding staying active regardless of the pain which altered work-related back pain disability in terms of reduction in sickness absence. While in Norway (Werner et al., 2007) although no significant shift in the overall population sickness behaviour and back beliefs were recorded, a small but significant shift in population beliefs towards more positive self-coping attitudes was observed. This outcome affirms the fact that a small improvement in the beliefs of the population, can result in a more substantial public health benefit than a large improvement in the small group with poor beliefs (Buchbinder et al., 2008).

Notable findings in this study highlight that the questions which showed a positive trend for the BBQ were in line with the campaign messages and demonstrates a positive trend regarding individual coping tactics even though statistically insignificant. The Canadian campaign also used BBQ as an outcome measure where positive trends were detected, yet the findings were not statistically significant (p-value = 0.13) on the overall effect of the campaign (Gross et al., 2010). Although the findings of the Canadian campaign concurred with our Zambian campaign, it was conducted in the general population and the Zambian campaign was conducted among nursing personnel. Therefore, this study's participants' perceptions about back pain experiences were mostly context job-related factors (Chapter 3) which were not part of the items measured in the back beliefs questionnaire and may have influenced the campaign outcomes. This suggests that workplace factors may also play an important role in back pain beliefs, attitudes, and experiences. Workplace factors (Chapter 3) comprise the work environment and job-related factors. Job-related factors include aspects such as workload, which is often influenced by work hours, human resource, and mode of performing tasks. The work environment comprises the infrastructure and facility furniture. In chapter 3, aspects of workload which include reduced human resource, high number of patient load, long working hours and mode of performing tasks were context factors that were reported to influence back pain experiences among nurses. Therefore, designing approaches that can concurrently correspond with available evidence-based back pain practices for nursing professionals may be beneficial.

The BBQ findings of the Zambian campaign differed from the Australian campaign which showed significant improvement on back pain beliefs in the general population, (Buchbinder et al., 2008). This may be because the campaigns were more dynamic, had bigger samples and were done over a period of three years. In our study there were no significant changes in back beliefs; nonetheless, positive trends in seven out of fourteen items of the back beliefs' questionnaire were recorded when more participants responded appropriately to the enquiries. Positive trends were also observed in all the eleven items of the participant activation measure when all respondents agreed with the statements. Gross and colleagues (2010), indicates that improvement in the back beliefs' questionnaire scores were observed only in three items (16, 19 and 26), an improvement that was sustained for three years. Werner et al. (2007) likewise reported small improvements in the population back beliefs when respondents answered five of the seven statements in line with the campaign messages. Further these outcomes increased significantly although they were not clinically relevant compared to the Australian campaign (Buchbinder et al., 2008) where 50% of the population had beliefs in line with the campaign messages at the end of the campaign. Cavil and Bauman (2004) specify that an awareness of 70% is regarded as average for media campaigns and constitutes a major factor of success. However, it is difficult to make direct comparisons between these campaigns because of differences in many factors including the scale and costs. Our campaign had limited resources (time and finances), it was conducted at the hospital setting only and not at community level because our target population were nurses. Nevertheless, over half of the participants exhibited beliefs in line with the campaign messages at the end of the campaign even though effects were statistically insignificant. Three of the BBQ questions which were in line with the campaign messaging of, "the key to feeling better sooner is to stay active," had negative trends which implies that these messages may not have been easily accepted because taking a short leave and bed rest have been a norm of coping with the effects back pain experiences among the nurses (Chapter 3). This implies that it may be required to overcome and achieve the long term behavioural change and entails understanding of aspects that are significant to their bio-medical training and previous back pain experiences.

The ability to self-manage can be measured by a reduction in healthcare utilisation including a reduction in the number of doctor visits and sick-leave days. This study recorded a reduction in the participants who reported use of pain medication, a decline in several sick-leave days and doctor visits after the campaign (see Table 19, Chapter 6). Similarly, a general decline in the number of sick-leave days, frequency of doctor visits and proportion of back claims declined over

the campaign duration in Australia and Scotland (Buchbinder et al., 2008; Werner., 2007). In Canada, a generally downward trend was observed in the proportion of back claims and sick duration although there was no meaningful statistical significance (Gross et al., 2010). This finding is relevant for low- and middle-income countries like Zambia where the healthcare budgets are often limited, as it helps to save on costs associated with obtaining sick-leave days. In addition, the healthcare system can be decongested thereby reducing on the healthcare costs which arise from healthcare utilisation. Further, it is a public health approach that is more cost effective than approaches that target individuals. Hence, back pain campaigns are an effective approach targeted at individuals but may enhance effects in the wider population because of the ability to reach larger numbers at the same time.

7.1.2 Cross-cultural validation and revision of key evidence-based back pain messages for nurses

Fourteen evidence-based messages retrieved from previous campaigns (Gross et al., 2010; Buchbinder et al., 2008; Werner et al., 2007; Waddell et al., 2007) were synthesised from study one (Chapter 2). Words have varying conceptual meanings in different cultures (Beaton et al., 2000). To ensure relevance and acceptability of the back pain messages, analysis about wording and meaning was done according to each message. This helped to identify differences in grammatical descriptions in the use of English terms in the synthesised back pain messages. Terminology and differences in descriptions in some of the messages made it difficult to attain word-by-word revision and for the participating nurses to clearly understand the messages. For instance, the message, “a back in motion improves faster,” was confusing (Table 11, Chapter 4) and difficult for the nurses to understand because in the Zambian setting that literally meant “a back that is moving”, but to where or for which purpose? The movement could be one without a specific purpose or direction. Another example is the message “try simple pain relief: if you need it, get advice; there’s a lot you can do to help yourself,” as the respondents did not know what was meant by “simple” pain relief. To achieve relevance and acceptability of the messages, some words or phrases in the back pain messages were changed. For instance, the message on “try simple pain relief” was rephrased to “avoid taking unnecessary pain killers when you have back pain; there is a lot you can do to help yourself”. It is believed that this action was helpful in delivering relevant and realistic messages to the target population, evident in the positive trends observed in the study.

All the back pain messages except for the message "back pain is rarely caused by a dangerous illness," were revised for use among nurses in Lusaka, Zambia, through cross-cultural validation. This is because the semantic meaning of the word "rarely" and its importance in interpreting the statement was highlighted and the relevance of the phrase "dangerous illness" was replaced with the general nursing context and the statement was congruent with the nurse's experiences. No cultural aspects concerning the messages were raised during cross-cultural validation of back pain messages. Areas of concern among participants were mostly the acceptability and relevance of wording and meaning of single items or phrases included in beliefs about back pain. This may be attributed to the fact that participants were professionals who had undergone biomedical training and had been working in the healthcare environment where local customs had minimal impact. It is worth noting that adaption of back pain messages in our study was done by nurses who were not part of the intervention study, therefore understanding of the back pain messages was needed for encouraging uptake during the campaign since messages have the potential of promoting healthy behavioural change and enhancing self-management abilities by shifting the responsibility of control onto individuals (Buchbinder et al., 2008). To attain relevance and acceptability some messages were merged or rephrased. Even though grammatically different, the messages "back pain: don't take it lying down" (Buchbinder et al., 2008) and "don't rest for prolonged periods" (Werner et al., 2007) implied "stay active" during back pain experiences. Therefore, these messages were combined and written as "the key to feeling better sooner is to stay active". Nonetheless, it is important to understand that even after revision, differences in semantic connotation may still exist because of regional variances. Hence, it is important to be conscious of how these variances can be minimised to augment equivalences.

7.1.3 Intervention design and ranking of back pain messages

The campaign was designed after the stakeholders' selection and affirmation of the five priority key messages deemed most relevant for Zambian nurses. The campaign was designed based on Tidier checklist guidelines, stakeholder recommendations and outcomes measures with the goal of promoting health, increasing knowledge, changing unhelpful perceptions of back pain, and enhancing self-management abilities of back pain disabilities. Having the target audience involved in the process of designing the campaign was critical for the behavioural intervention because it

helped to identify the capabilities, importance attached, contents and methods of delivery. Use of stakeholder recommendations in the designing of the campaign was also necessary because it reduced health disparities by ensuring cultural appropriateness and relevance in the target audience (Ayala & Elder, 2011). Cross-cultural validation deliberations and revision of the messages facilitated in reaching consensus on the campaign materials and establishing the most acceptable modes of delivering the campaign. More so, the design enabled us to obtain pre- and post-campaign data which was vital in demonstrating the intervention effects and aided a detailed analysis of trends that occurred before and after the campaign. This was a strength of this study in that evaluation of back pain experiences and disabilities was heightened.

7.1.4 Campaign feedback

Feedback on the campaign obtained demonstrates that almost all participants were satisfied with the back pain campaign including the facilities and materials which were used. Also, participants revealed that the campaign had influenced their back care goals. Perhaps being included in the designing of the campaign, cross-culturally validating the back pain messages for understanding and having face to face interactions with the participants may have influenced the positive feedback. The campaign feedback obtained simultaneously relates to the positive trends which were observed in this study. Similar, results were reported in the Australian and Netherlands campaign (Suman et al., 2017; Buchbinder et al., 2008) and was demonstrated by the proportion of individuals indicated being satisfied and increases in the website visits. From the feedback obtained it appears the back pain campaign delivered to nurses in Lusaka, Zambia is promising in enhancing self-management activities of back pain and related behaviours during back pain experiences in the nursing profession.

7.2 LESSON LEARNT AND LIMITATIONS

This is the first study on self-management of back pain that has been conducted in the nursing profession in Lusaka, Zambia. The process of synthesising and cross-cultural validation of back pain messages including designing and implementation of the intervention emphasised the importance of communication (both written and verbal) as a primary factor in enhancing self-management of back care goals in the target population. The findings of the study indicated the

need for considering contextual factors of relevance and acceptability as well as the importance of semantics as part of designing educational interventions for LMICs settings. In this study, cultural factors did not play a major role in the adaptation and refinement of the messages, however, this finding should be tested in other contexts. In addition, the nominal group technique interactions helped the researcher in developing a deeper understanding of factors that impede or facilitate effective implementation of community interventions such as the back campaign. Further, the provision of souvenirs to participants no matter how small also contributes to the creation of partnerships among individuals and research centres that supported the flow of the research activities.

- The major limitation in the study was the population sample as individuals were their own controls. Because of the COVID19 pandemic we unfortunately experienced excessive movements of nurses both in and out of the centres during the intervention follow up period. Hence, post intervention data which was collected may not have been for nurses who were present at baseline. This could have impacted on the results because respondents may have responded to the questionnaire queries based on the campaign materials which were deposited at the centres. On the other hand, it was encouraging to see how many completed the questionnaires despite COVID19 challenges which I can only imagine, put a lot of strain on the nurses and probably it also changed their work environment. Further, the contact numbers for WhatsApp messaging where collected during baseline data collection, therefore, the in and out movements of nurses at the centres implies that nurses who were not present at the time of baseline data collection did not have access to the videos which were relayed twice every week.
- Self-administered questionnaires were used for data collection therefore response bias must be recognised as a potential risk to internal validity as participants may have answered questions inaccurately or misleadingly for social acceptability. Participants may have also responded to events surrounding their back pain experiences with less accuracy or exaggeration which could be a source of recall and report biases.
- Because the study was questionnaire based, information about non-response could not be generated
- The campaign was limited to four level one hospitals in the peri-urban areas of Lusaka and information obtained was based on participants individual reports which may be specific

to their work context. Therefore, outcomes from this study may only be generalised to similar contexts even though similar situations may occur in other settings.

- Accuracy of the responses was not assessed which may be a source of response and information biases.
- Participants also self-reported their feedback. This cannot be verified thus could be a source of desirability and selective recall bias
- Design limitations: there was no long term follow-up due to limited time and resources hence, behavioural trends overtime could not be identified.
- Only studies done in English language were included therefore eligible studies done in other languages may have been missed resulting in selection bias
- The back pain messages were cross-culturally validated therefore findings obtained in a specific context maybe difficult to generalise because of cultural differences and dynamics.

7.3 RECOMMENDATIONS FOR FUTURE RESEARCH AND CLINICAL PRACTICE

- Positive trends and feedback obtained in the campaign makes a persuasive evidence base that enhances the efficiency of more targeted strategies therefore, using similar approaches can be used to advance self-management of back pain among nursing professionals
- Positive feedback and participant satisfaction with the back campaign in the workplace setting is a good basis for implementing practical strategies aimed at promoting health and minimising back pain experiences which must be encouraged in future programmes.
- Workplace factors among nurses played an important role in back pain beliefs, attitudes, and experiences. Therefore, designing approaches that can concurrently correspond with available evidence based back pain practices for nursing professional may be beneficial in future research.
- Messages on avoiding bedrest were not easily accepted because taking a short leave and bed rest has been a norm of coping with the effects back pain experiences. Understanding of characteristics that are significant to nurse's bio-medical training and previous back pain experiences must also be explored to foster behavioural change

- Future research should also focus on identifying approaches and strategies that could help overcome and achieve the necessary behavioural change of avoiding bed rest during back pain experiences.

Declaration by the candidate

Nkhata, L. A., Brink, Y., Ernstzen, D., & Louw, Q. A.

Discussion

Regarding chapter 7, the nature and scope of my contribution were as follows:

Author	Email-address	Nature of contribution Extent of contribution	Percentage (%)	Signature
Loveness A. Nkhata	Lnkhata@yahoo.com	Conception and design: interpretation of data; drafting of chapter and critical revision.	80%	
Prof. Quinette A. Louw	qalouw@sun.ac.za	Supervisory role: conception and interpretation of data, revising for important intellectual content and final approval of the version to be submitted.	10%	
Dr Yolandi Brink	ybrink@sun.ac.za	Supervisory role: critical revision and proofreading it.	5%	
Dr Dawn Ernstzen	dd2@sun.ac.za	Supervisory role: critical revision and proofreading it.	5%	

CHAPTER EIGHT

CONCLUSION

The overall aim of this study was to assess the effects of a cross-culturally validated back pain campaign on back beliefs, coping strategies and participant activation for nurses in Lusaka, Zambia. A tailored campaign was designed of which the outcome was campaign material that was valid and feasible for the Zambian nursing context. The campaign showed no statistically significant differences in BBQ and participant activation measures observed for back beliefs and participant activation after the campaign although many of the outcomes showed positive trends after the campaign. The key outcome for the Zambian campaign was the Patient activation measures where positive trends in all the eleven items were observed when more people agreed with the statements after the campaign. Therefore, we can conclude that.

- The back campaign was successful in influencing the attitudes towards the back care goals and promoting healthy behaviours among the nurses.
- The back campaign and materials used though targeted at individuals were an effective approach that enhanced effects in the wider population because even though we experienced excessive in and out of the facilities movements of nurses the facilities as a result of COVID19 restriction during the follow up period positive trends were still detected.
- The back campaign demonstrated an effective approach that could decongest the healthcare system and minimise healthcare costs because of the reductions in the number of sick-leave days, frequency of doctor visits and use of pain medication during back pain experiences.
- The use of stakeholder recommendations in the designing of the campaign is beneficial in delivering relevant and realistic interventions in target populations which is evident in the positive trends observed.
- The cross-cultural validation deliberations and revision of the messages is beneficial establishing acceptable interventions in target populations

Declaration by the candidate

Nkhata, L. A., Brink, Y., Ernstzen, D., & Louw, Q. A.

Conclusion

Regarding chapter 8, the nature and scope of my contribution were as follows:

Author	Email-address	Nature of contribution Extent of contribution	Percentage (%)	Signature
Loveness A. Nkhata	Lnkhata@yahoo.com	Design and interpretation of data; drafting of chapter and critical revision.	80%	
Prof. Quinette A. Louw	qalouw@sun.ac.za	Supervisory role: conception interpretation of data, critical revising for important intellectual content and final approval of the version to be submitted.	10%	
Dr Yolandi Brink	ybrink@sun.ac.za	Supervisory role: critical revision and proofreading it.	5%	
Dr Dawn Ernstzen	dd2@sun.ac.za	Supervisory role: critical revision and proofreading it.	5%	

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APPENDICES

APPENDIX (A) INFORMED CONSENT FOR STUDY 2

Informed Consent Form for Participation in a Research Study

Study Title: The Effectiveness of a Contextualized Back Pain Campaign for Nurses in Lusaka, Zambia

Reference Number_____

Dear participant,

You are invited to participate in a Qualitative Study on contextualization of key evidence-based back pain messages for nurses in Zambia. This study is being done by Ms. Loveness. A. Nkhata a PHD student at the Stellenbosch University, South Africa and my supervisors are Prof. Louw, Dr. Brink and Dr. Ernstzen.

Why is the study being done? Nurses work as independent practitioners or team members in providing help to patients with their activities of daily living such as dressing, eating, mobility and personal hygiene. These often involve lifting, transferring and repositioning of patients, which exposes nurses to a higher risk of Back Pain. The aim of this study is to ascertain which local contextual factors may influence the understanding, feasibility and uptake of evidence-based messages on back pain as reported in published campaigns

What are the study procedures? What will I be asked? If you agree to take part in this study, you will be requested to take part in a focus group discussion which will take 1h30mins to complete. The questions which will be asked concern stakeholder perspectives of evidence-based messages reported in published campaigns, their delivery modes and duration. With your permission I would like to record the interview and later transcribe it for the purposes of analysis. Your name is not going to appear on the transcription. With the help of my supervisors at the University of Stellenbosch Prof. Louw, Dr. Brink and Dr. Ernstzen I will do the analysis of the interview.

What other options are there? Your participation in this study is voluntary. You are free to participate or not.

What are the risks or inconveniences of this study? The inconvenience of taking part in this study includes taking your time (1h30mins) in the focus group discussion. Focus group discussions (FGDs) are confidential but due to the nature of the topic, personal information might be shared during the FGDs, which may lead to emotional responses and inner conflict. However, as the researcher I will ensure that boundaries are maintained during the FGDs.

What are the benefits? There are no direct benefits that you will be given in exchange for information obtained. However, information obtained from this study will contribute to wellness of nurses during clinical practice.

Will I receive payment for participation? As a participant you will not be paid for participation. However, you will be reimbursed for your time, inconvenience and expenses for transport. You will be given stationery souvenirs and R100.00 for transport.

How will my personal information be protected? Focus group discussions are confidential. Additionally, information that you will give during the discussions will treated confidentially and may only be disclosed with your permission. No recordings will be released to any persons or institutions other than my supervisors at the University of Stellenbosch. Results from this study may be published or presented in clinical meeting as anonymous as there will be no individual names used. You should also understand that there are certain ethical limits. The University Research Ethics Committees may inspect study records as part of their audits but usually this focus is on the researchers and not respondents.

Can I withdrawal from the study? You are free to withdraw from the study at any time if you wish to do so. There are no penalties or consequences of any kind if you decided to do so.

Clarifications and access to results: should you need any clarifications or access to study results do not hesitate to contact the researcher on the contacts that have been given below.

Ms. Loveness Nkhata

University of Stellenbosch; E-mail: Lnkhata@yahoo.com; Mobile: + 27731727502 (RSA) or +260-966-435366/ 955-435366 (ZAM).

You may also get in touch with my supervisors;

Prof. Louw (Supervisor), University of Stellenbosch, E-mail: qalouw@sun.ac.za

Dr. Brink (Supervisor), University of Stellenbosch, E-mail: ybrink@sun.ac.za

Dr. Ernstzen (Supervisor), University of Stellenbosch, E-mail: dd2@sun.ac.za

Alternatively, you may also contact the research ethics committees on the following details:

Stellenbosch University Health Research Ethics Committee at +2721-938 9207

University of Zambia SoHS Research Ethics Committee at +260955155633

INFORMED CONSENT FOR PARTICIPATION IN THE STUDY

I have had all the above information explained and I understood the explanation. I have been offered to answer any of my questions concerning the procedures involved in this study and I have been given a copy of this form to keep.

_____ _____

Participants Name (Printed) Date of birth

_____ _____

Signature of Participant Date

Only if verbal consent is provided, the interviewer must sign below in the presence of the participant and a witness.

_____ _____

(Signature of interviewer certifying that informed consent has been given verbally by respondent) Date

_____ _____

(signature of witness certifying that informed consent has been given verbally by respondent)

INFORMED CONSENT FOR THE RECORDING OF THE INTERVIEW

The purpose of recording this interview and the use, storage and final destruction of the tapes has been explained to me and I understood the explanation. I have been offered to answer any of my questions concerning the procedures involved in the recording of the interview and I have been given a copy of this form to keep.

_____ _____

Participants Name (Printed) Date of birth

_____ _____

Signature of Participant Date

Only if verbal consent is provided, the interviewer must sign below in the presence of the participant and a witness.

_____ _____

(Signature of interviewer certifying that informed consent has been given verbally by respondent) Date

_____ _____

(signature of witness certifying that informed consent has been given verbally by respondent)

STATEMENT BY THE RESEARCHER

I_____, declare that I have explained the information given in this document to _____. Who was encouraged and given ample time to ask me questions. Conversations were conducted in English and no translator was used.

Signed at _____ on _____

Place Date

_____ _____

Researcher's Signature Witness

APPENDIX (B) INFORMED CONSENT FOR PARTICIPANTING IN STUDY 3

Informed Consent Form for Participation in the Research Study

Title: The Effectiveness of a Contextualized Back Pain Campaign for Nurses in Lusaka, Zambia

Reference Number_____

Dear participant,

You are invited to participate in a study on **"the effectiveness of a contextualized Back Pain campaign for nurses in Lusaka, Zambia."** This study is being done by Ms. Loveness A. Nkhata a PHD student at the Stellenbosch University, South Africa and my supervisors are Prof. Louw, Dr. Brink and Dr. Ernstzen.

Why is the study being done? Nurses work as independent practitioners or team members in providing help to patients with their activities of daily living such as dressing, eating, mobility and personal hygiene. These often involve lifting, transferring and repositioning of patients, which exposes nurses to a higher risk of Back Pain. The aim of this study is to evaluate the effectiveness of a contextualized Back Pain campaign for nurses Lusaka, Zambia.

What are the study procedures? If you agree to take part in this study, you will be taking part in the back-pain campaign for nurses and you will be requested to fill a questionnaire at the beginning of the intervention and after. One of the intervention methods involves transmission of key messages using the WhatsApp messaging App we therefore seek your permission to send these messages to you on your available number.

What are the risks or inconveniences of this study? The inconvenience of taking part in this study includes you taking time off your busy schedule in answering questions from the questionnaire. There are no risks involved with the intervention as it is educational and noninvasive. Additionally, there is no identifying information that will be collected from you which may be linked to your inputs on the subject matter. However, as the researcher I will ensure that confidentiality is maintained at all costs and data that will be collected shall be stored on a password protected computer only accessible by the researcher.

What are the benefits? Apart from a souvenir there are no direct benefits that you will be given in exchange for information obtained. However, information obtained from this study will highlight aspects that will help improve your general well-being.

How will my personal information be protected? Your personal information shall be protected because no names shall be written on the questionnaires to disclose identity. Instead each questionnaire will have a serial number that will be assigned for coding purposes. Information that you will give is confidential and may only be disclosed with your permission. Results from this study may be published or presented in clinical meetings but without identities. You should also understand that there are certain ethical limits, the Research Ethics Committee may inspect study records as part of their audits but usually this focus is on the researchers and not respondents.

Can I withdrawal from the study? Your participation in this study is voluntary. You are free to withdraw from the study at any time if you wish to do so. There are no penalties or consequences of any kind if you decided to do so.

Clarifications and access to results: should you need any clarifications or access to study results do not hesitate to contact the researchers on the contacts that have been given below.

Ms. Loveness Nkhata, University of Stellenbosch, **E-mail:** Lnkhata@yahoo.com
Telephone: +2731727502 (RSA) or +260-966-435366/ 955-435366 (ZAM).
Prof. Louw (Supervisor), University of Stellenbosch, **E-mail:** qalouw@sun.ac.za
Dr. Brink (Supervisor), University of Stellenbosch, **E-mail:** ybrink@sun.ac.za
Dr. Ernstzen (Supervisor), University of Stellenbosch, **E-mail:** dd2@sun.ac.za

Alternatively, you may also contact the research ethics committees on the following details:

Stellenbosch University Health Research Ethics Committee at +2721-938 9207

University of Zambia SoHS Research Ethics Committee at: +260955155633

INFORMED CONSENT FOR PARTICIPATION IN THE STUDY

I have had all the above information explained and I understood the explanation. I have been offered to answer any of my questions concerning the procedures involved in this study and I have been given a copy of this form to keep.

_____

Participants Name (Printed)

_____

Signature of Participant Date

APPENDIX (C) DISCUSSION GUIDE

THE EFFECTIVENESS OF A CROSS-CULTURAL VALIDATION BACK PAIN CAMPAIGN FOR NURSES IN LUSAKA, ZAMBIA

Date of interview:

Address:

FGDs No:

No: of participant

Introduction

The aim of the focus group discussion is to contextualize key evidence-based back messages for nurses in Zambian and obtain consensus on the delivery mode of the campaign. The nominal group technique approach will be used. The researcher will present the messages to the groups and will allow individuals to come up with ideas on how best the messages can be used. Once the messages have been established, they will be displayed to the group for collective agreement. After all the focus group discussions, the researcher will compile the contextualized messages and presented to all participants individually to check if the revised messages are appropriate for the Zambian context.

1. What have been your experiences with Back pain?
2. Are there contextual factors that may influence back pain among nurses in Zambia?
3. Are there contextual factors on back pain campaigns?

Key back pain campaign messages - Present messages to focus group members

4. What are your perspectives of evidence-based messages reported in published campaigns?
5. Which local contextual factors may influence your understanding, feasibility and uptake of evidence-based messages reported in published campaigns?
6. How should the messages be revised?
7. What would be your preferred mode of delivery, frequency and duration for the proposed LBP campaign for nurses

Nominal technique at the end

APPENDIX (D) DEMOGRAPHIC QUESTIONNAIRE FOR FGDs

Study Title: The Effectiveness of a Contextualized Back Pain Campaign for Nurses in Lusaka, Zambia

Serial No: _____

Please fill in the following details

1. Age (as at last birthday) _____
2. Gender: 1. Male ❒ 2. Female ❒
3. Qualification (s) _____
4. Work Status in the last 12 Months ❒ Full Time ❒Part Time
5. Please give the approximate hours per week (HPW) you spend in direct patient care as part of your nursing practice _____
6. (a) Year of Graduation from nursing school_____
   (b) Years of Professional experience_____
7. Please indicate your work setting

❒ Medical wards ❒ Pediatrics wards ❒ Theatre
❒ Surgical wards ❒ Maternity wards ❒ OPD clinics

APPENDIX (E) BACK BELIEFS QUESTIONNAIRE

Serial No: _____

Study Title: The effectiveness of a contextualized back pain messages for nurses in Zambia.

Please answer the following questions

Section A: Demographic data

1. Age category

❒18–24 ❒ 25–34 ❒ 35–49 ❒ 50–65 ❒ Over 65 ❒ Missing data

2. Gender: ❒ Female ❒ Male

1. Please give the approximate hours per week (HPW) spent in direct patient care_____
2. Years of Professional experience_____
3. Please indicate your work setting: ❒ Medical wards ❒ Pediatrics wards ❒ Theatre ❒ Surgical wards ❒ Maternity wards ❒ OPD clinics

6. History of Back Pain:

❒ Lifetime history of Back Pain ❒ History of Back pain in 12 months ❒ History of Back pain in past 2 months

Section B Items within the back beliefs questionnaire (BBQ)

1. There is no real treatment for Back pain	1. ❒ Yes	2. ❒ No
2. Back pain will eventually stop you from working	1. ❒ Yes	2. ❒ No
3. Back pain means periods of pain for the rest of one's life	1. ❒ Yes	2. ❒ No
4. Doctors cannot do anything for back pain	1. ❒ Yes	2. ❒ No
5. A bad back should be exercised	1. ❒ Yes	2. ❒ No
6. Back pain makes everything in life worse	1. ❒ Yes	2. ❒ No
7. Surgery is the most effective way to treat back pain	1. ❒ Yes	2. ❒ No
8. Back pain may mean you will end up in a wheelchair	1. ❒ Yes	2. ❒ No
9. Alternative treatments are the answer to back pain	1. ❒ Yes	2. ❒ No
10. Back pain means lengthy periods of time off work	1. ❒ Yes	2. ❒ No
11. Medication is the only way of relieving back pain	1. ❒ Yes	2. ❒ No
12. Once you have had back pain there is always a weakness	1. ❒ Yes	2. ❒ No
13. Back pain must be rested	1. ❒ Yes	2. ❒ No
14. Later in life back pain gets progressively worse	1. ❒ Yes	2. ❒ No

APPENDIX (F) PARTICIPANT ACTIVATION MEASURE QUESTIONNAIRE

Serial No: _____

Study Title: Contextualization of evidence-based low back pain messages for nurses in Zambia.

Please answer the following questions

Section A: Demographic data

1. Age category

❒18–24 ❒ 25–34 ❒ 35–49 ❒ 50–65 ❒ Over 65 ❒ Missing data

2. Gender: ❒ Female ❒ Male

4. Please give the approximate hours per week (HPW) spent in direct patient care_____

5. Years of Professional experience_____

6. Please indicate your work setting: ❒ Medical wards ❒ Pediatrics wards ❒ Theatre ❒ Surgical wards ❒ Maternity wards ❒ OPD clinics

6. History of Back Pain:

❒ Lifetime history of Back pain ❒ History of Back pain in 12 months ❒ History of Back pain the in past 2 months

7. Did you obtain any sick leave days in the past 2 months?

❒ Yes ❒ No

8. If you answer in question is yes how sick leave days were due to Back pain? _____

9. How many days did your back pain last?

❒ 1-3 days ❒4-7dasys ❒1 week ❒over 2 weeks

10. How many doctor visits did you make in the past 2 months?

❒ 1-3 ❒ 4-7 ❒8-10

11. How many doctor visits were because of back pain? _____

Section B Items within the Participant Activation Measure questionnaire (PAMQ)

Tick the appropriate answer for you in this section

8. When all is said and done, I am the person who is responsible for managing my health condition

1. Disagree Strongly ❒ 2. Disagree Agree ❒ 3. Agree Strongly ❒ 4. NA ❒

9. Taking an active role in my own health care is the most principal factor in determining my health and ability to function

1. Disagree Strongly ❒ 2. Disagree Agree ❒ 3. Agree Strongly ❒ 4. NA ❒

10. I am confident that I can take actions that will help prevent or minimize some symptoms or problems associated with my health condition

1. Disagree Strongly ❒ 2. Disagree Agree ❒ 3. Agree Strongly ❒ 4. NA ❒

11. I know what each of my prescribed medications do

1. Disagree Strongly ❒ 2. Disagree Agree ❒ 3. Agree Strongly ❒ 4. NA ❒

12. I am confident that I can tell when I need to go get medical care and when I can handle a health problem myself

1. Disagree Strongly ❒ 2. Disagree Agree ❒ 3. Agree Strongly ❒ 4. NA ❒

13. I am confident I can tell my health care provider concerns I have even when he or she does not ask

1. Disagree Strongly ❒ 2. Disagree Agree ❒ 3. Agree Strongly ❒ 4. NA ❒

14. I am confident that I can follow through on medical treatments I need to do at home

1. Disagree Strongly ❒ 2. Disagree Agree ❒ 3. Agree Strongly ❒ 4. NA ❒

15. I understand the nature and causes of my health condition

1. Disagree Strongly ❒ 2. Disagree Agree ❒ 3. Agree Strongly ❒ 4. NA ❒

16. I know the different medical treatment options available for my health condition

1. Disagree Strongly ❒ 2. Disagree Agree ❒ 3. Agree Strongly ❒ 4. NA ❒

17. I have been able to maintain the lifestyle changes for my health that I have made

1. Disagree Strongly ❒ 2. Disagree Agree ❒ 3. Agree Strongly ❒ 4. NA ❒

18. I know how to prevent further problems with my health condition

1. Disagree Strongly ❒ 2. Disagree Agree ❒ 3. Agree Strongly ❒ 4. NA ❒

19. I am confident I can figure out solutions when new situations or problems arise with my health condition

1. Disagree Strongly ❒ 2. Disagree Agree ❒ 3. Agree Strongly ❒ 4. NA ❒

20. I am confident that I can maintain lifestyle changes like diet and exercise even during times of stress

1. Disagree Strongly ❒ 2. Disagree Agree ❒ 3. Agree Strongly ❒ 4. NA ❒

Thank you

APPENDIX (G) BACK PAIN MESSAGES REVISION QUESTIONNAIRE

UNIVERSITY OF STELLENBOSCH

OCCUPATIONAL HEALTH AND THE PRACTICE OF NURSING

BACK PAIN MESSAGES QUESTIONNAIRE: **Serial No: _____**

You are kindly requested to answer the following questions by filling in the blank or putting (√) ticking in the appropriate box; one tick for each question. Please do your best and answer every question.

SECTION A

1. Age (as at last birthday) _____
2. Gender: 1. Male ❒ 2. Female ❒
3. Qualification (s) _____
   a. Work Status in the last 12 Months ❒ Full Time ❒Part Time

4. Please indicate your work setting

❒ Medical wards ❒ Pediatrics wards ❒ Theatre

❒ Surgical wards ❒ Maternity wards ❒ OPD clinics

SECTION B

5. Below are the eight (8) revised back pain messages. Please indicate by ticking (√) 'Yes' if you agree with the message or 'No' if you disagree and 'not sure' if you are unsure.

   i. Back pain is rarely caused by a dangerous illness

   Yes No Not sure

   Pleases give a reason if the answer you have chosen is 'no' or 'not sure.'

   _____

   _____

   _____

   _____

   ii. The Key to feeling better sooner is to stay active

   Yes No Not sure

Pleases give a reason if the answer you have chosen is ‘no’ or ‘not sure.’

_____

_____

_____

iii. Work with your back, one recovers faster by returning to work as quickly as possible.

Yes No Not sure

Pleases give a reason if the answer you have chosen is ‘no’ or ‘not sure.’

_____

_____

_____

_____

iv. Back pain is a personal responsibility, it is up to you to look after your back

Yes No Not sure

Pleases give a reason if the answer you have chosen is ‘no’ or ‘not sure.’

_____

_____

_____

_____

v. X-rays are not useful to detect the cause of back pain

Yes No Not sure

Pleases give a reason if the answer you have chosen is ‘no’ or ‘not sure.’

_____

_____

_____

_____

vi. Surgery is not the answer for back pain

Yes No Not sure

Pleases give a reason if the answer you have chosen is 'no' or 'not sure.'

_____

_____

_____

_____

vii. Avoid taking unnecessary pain killers when you have back pain; there is a lot you can do to help yourself.

Yes No Not sure

Pleases give a reason if the answer you have chosen is 'no' or 'not sure.'

_____

_____

_____

_____

viii. Back pain usually gets better over time

Yes No Not sure

Pleases give a reason if the answer you have chosen is 'no' or 'not sure.'

_____

_____

_____

_____

6. In the table below please indicate by ticking (√) **the 5** most important messages for you

S/no	Messages	5 (√) most important
1.	Back pain is rarely caused by a dangerous illness	
2.	The Key to feeling better sooner is to stay active	
3.	Work with your back, one recovers faster by returning to work as quickly as possible.	
4.	Back pain is a personal responsibility, it is up to you to look after your back	
5.	X-rays are not useful to detect the cause of back pain	
6.	Surgery is not the answer for back pain	
7.	Avoid taking unnecessary pain killers when you have back pain; there is a lot you can do to help yourself.	
8.	Back pain usually gets better over time	

Thank you for taking time to complete this questionnaire

APPENDIX (H) ELECTRONIC SEARCH STRATEGY USED IN THE SYSTEMATIC REVIEW

1. (BACK or LUMBAR or LUMBO* or/ and PAIN)**/all subheadings**
2. Musculoskeletal pain/ or back pain/ or BP/ or low back pain/ or lower back / or LBP **all subheadings**
3. Low back pain/ or Backache/ or pain/ or injuries all subheadings
4. **Educational ("interventions" OR "campaign" OR "treatment" OR "management" OR "self-management")**
5. **Nurse/ or nurses/ or nursing**
6. **#1 OR #2 OR #4 OR #5**
7. **#2 OR #4 OR #5**
8. **#1 OR #3 OR #4 OR #5**

Database	No of items	Duplicates per database	Total Duplicates	Total items
PUBMED	24	1	1	27
MEDLINE	0	0	0	0
CINAHL	0	0	0	0
Cochrane	2	0	0	2
SCOPUS	0	0	0	0
EMBASE	11	0	0	10
PEDro	0	0	0	0
TRIALS	0	0	0	0
NIOSH	0	0	0	0
Total	**37**	**1**	**1**	**39**

APPENDIX (I) The TIDieR (Template for Intervention Description and Replication) Checklist)

The TIDieR (Template for Intervention Description and Replication) Checklist*:

Information to include when describing an intervention and the location of the information

Item number	Item	Where located **	
		Primary paper (page or appen number)	Other † (details)
	BRIEF NAME		
1.	Provide the name or a phrase that describes the intervention.	_____ ___	_____ _
	WHY		
2.	Describe any rationale, theory, or goal of the elements essential to the intervention.	_____ ___	_____ ____
	WHAT		
3.	Materials: Describe any physical or informational materials used in the intervention, including those provided to participants or used in intervention delivery or in training of intervention providers. Provide information on where the materials can be accessed (e.g. online appendix, URL).	_____ ___	_____ ____
4.	Procedures: Describe each of the procedures, activities, and/or processes used in the intervention, including any enabling or support activities.	_____ ___	_____ ____
	WHO PROVIDED		
5.	For each category of intervention provider (e.g. psychologist, nursing assistant), describe their expertise, background and any specific training given.	_____ ___	_____ ____
	HOW		
6.	Describe the modes of delivery (e.g. face-to-face or by some other mechanism, such as internet or telephone) of the intervention and whether it was provided individually or in a group.	_____ ___	_____ ____
	WHERE		
7.	Describe the type(s) of location(s) where the intervention occurred, including any necessary infrastructure or relevant features.	_____ ____	_____ ____
	WHEN and HOW MUCH		

8.	Describe the number of times the intervention was delivered and over what period of time including the number of sessions, their schedule, and their duration, intensity or dose.	_____ ____	_____ ____
	TAILORING		
9.	If the intervention was planned to be personalised, titrated or adapted, then describe what, why, when, and how.	_____ ____	_____ ____
	MODIFICATIONS		
10.‡	If the intervention was modified during the course of the study, describe the changes (what, why, when, and how).	_____ ____	_____ ____
	HOW WELL		
11.	Planned: If intervention adherence or fidelity was assessed, describe how and by whom, and if any strategies were used to maintain or improve fidelity, describe them.	_____ ____	_____ ____
12.‡	Actual: If intervention adherence or fidelity was assessed, describe the extent to which the intervention was delivered as planned.	_____ ____	_____ ____

** **Authors** - use N/A if an item is not applicable for the intervention being described. **Reviewers** – use '?' if information about the element is not reported/not sufficiently reported.

† If the information is not provided in the primary paper, give details of where this information is available. This may include locations such as a published protocol or other published papers (provide citation details) or a website (provide the URL).

‡ If completing the TIDieR checklist for a protocol, these items are not relevant to the protocol and cannot be described until the study is complete.

* We strongly recommend using this checklist in conjunction with the TIDieR guide (see *BMJ* 2014;348: g1687) which contains an explanation and elaboration for each item.

* The focus of TIDieR is on reporting details of the intervention elements (and where relevant, comparison elements) of a study. Other elements and methodological features of studies are covered by other reporting statements and checklists and have not been duplicated as part of the TIDieR checklist. When a **randomised trial** is being reported, the TIDieR checklist should be used in conjunction with the CONSORT statement (see www.consort-statement.org) as an extension of **Item 5 of the CONSORT 2010 Statement.** When a **clinical trial protocol** is being reported, the TIDieR checklist should be used in conjunction with the SPIRIT statement as an extension of **Item 11 of the SPIRIT 2013 Statement** (see www.spirit-statement.org). For alternate study designs, TIDieR can be used in conjunction with the appropriate checklist for that study design (see www.equator-network.org).

APPENDIX (J) DRAMA SCRIPT

Thandiwe: Hello my name is Thandiwe. Today we will talk about pain

To help me demonstrate about back pain……. Mwansa

(Mwansa enters gloomy)

Mwansa: Hello.

Thandiwe: How are you?

Mwansa: My back is sore, am finished, let me just go and get some days off!

Thandiwe: Ow! Sorry about that. But have you tried to do a few stretches for now?

Mwansa: Stretches? I can't even try that it will just make my pain worse

Thandiwe: Not at all Mwansa, "The key to feeling better sooner when you have back pain is to stay active, it is best to continue with your normal everyday activities. Being active and exercising will not worsen your pain."

Mwansa: Hey, you don't know how sore this back is, even when I take 4 Panadol plus 2 brufen and 2 diclofenac it's not helping. May be there is something wrong with me, is it just normal back pain? I need to take some rest days seriously.

Thandiwe: Mwansa, you are worrying and stressing yourself too much. Back pain is just a symptom, it is rarely caused by a dangerous illness, there is no need for great concern. It is important for you to avoid taking unnecessary pain killers for back pain there is a lot you can do to help yourself.

Mwansa: I think you are right, often the lifting, and repeated activities we perform in awkward postures as nurses increases the risk of back aches.

Thandiwe: Yes, you are right! you can get help on the right way to do things. Moreover, back pain is a personal responsibility, it is up to you to look after your back.

Mwansa: Sure, even the physiotherapist last week emphasized that when you have back pain, the goal is to make you feel better, get you moving freely and easily.

Thandiwe: In fact, most cases of back pain get better on their own within a few weeks. There is no need to think about surgery or worry. Staying active is the most important way you can help yourself if you have back pain.

END

APPENDIX (K) STUDY TIME PLAN AND BUDGET

Time Plan

Time plan August 2017 – March 2020				
Date	**Research Activity**			
Aug 2017- April 2018	Proposal writing			
Feb 2018 - Aug 2018	Study I			
May 2018	Submit for proposal review			
June 2018	Submit for on-line ethical review and clearance			
Aug 2018 - Sept 2018	Qualitative course and Study I publication			
Sept 2018 – Jan 2019	Study II at Hospital 5			
Jan 2019 - May 2019	Development of the campaign and pilot study to validate outcome measures			
May 2019 - August 2019	Study III Baseline measurements (4 weeks)			
Week 1	Hospital 1			
Week 2		Hospital 2		
Week 3			Hospital 3	
Week 4				Hospital 4
Sept 2019	Implementation of Back Campaign			
Week 1	Hospital 1			
Week 2		Hospital 2		
Week 3			Hospital 3	
Week 4				Hospital 4
Dec 2019 - Feb 2020	Exit outcome measurements			
Week 1	Hospital 1			
Week 2		Hospital 2		
Week 3			Hospital 3	
Week 4				Hospital 4
March 2020 – Jun 2020	Data analysis			
October 2020 -	Report write up and submission			

Budget

Study Budget

Period: August **2017 to** August **2020**			
ITEM	**UNIT**	**COST/UNIT**	**Total Cost (R)**
Research assistant	Independent search, appraisal and extraction of data, Organizing interviews, Data analysis, Data verification	R 8000 for 10 months	R 80 000
Equipment	Digital Voice Recorder Laptop	R5 000 R15, 000	R20 000
Domestic travel	Fieldwork: travels	R10 /km	R8 500
Facility fee	Hire venue for to conduct FGDs	R3 500	R3 500
Transcription	FGDs	@ R8 00	R 40 000
Paper/printing/photocopying	Questionnaires; Selected Transcripts, articles, data extraction sheets	-	R 12 000
Campaign material	Campaign material production	-	R 40 000
Communication	Airtime and Internet services	-	R 15 000
Participant refreshments Participant incentives (at end of interview)	Sandwich/Muffin with Juice/Coffee/Tea @ 30 persons R200 gift for participants x 30 Transport reimbursement @ 100 Souvenir for Study III (Campaign t-shirts)	R 1 500 R 6000 R 3000 R 20 000	R 30 500
Estimated total costs			**R249 500**
Contingency 10%			**R 24 950**
Estimated total expenditure			**R 274 450**

Funding source NRF (2017 to 2019) is available.

APPENDIX (L) ETHICAL CLEARANCE AND PERMISSIONS LETTERS

STELLENBOSCH UNIVERSITY
FACULTY OF MEDICINE AND HEALTH SCIENCES

3 July 2018

Dr Nicola Barsdorf
HREC
Tygerberg Campus

Dear Dr Barsdorf

APPLICATION ACCEPTED BY THE EVALUATION COMMITTEE: PHD IN PHYSIOTHERAPY BY MS YANILA LOVENESS NKHATA (17326443)

Please be informed that the candidate Ms Yanila Loveness Nkhata's application has been approved by the Review Committee as indicated by the supporting document. The HREC representative was Dr Linzette Morris.

Kind regards

J.A. Chabilall

Jyothi Chabilall
Head: Doctoral Office

UNIVERSITEIT
STELLENBOSCH
UNIVERSITY

Health Research Ethics Committee (HREC)

Approval Notice

New Application

04/10/2018

Project ID :7431

HREC Reference #: S18/06/125

Title: THE EFFECTIVENESS OF A CONTEXTUALIZED BACK PAIN CAMPAIGN FOR NURSES IN LUSAKA, ZAMBIA

Dear Miss Loveness Nkhata,

The **Response to Modifications** received on 03/10/2018 11:55 was reviewed by members of **Health Research Ethics Committee 2 (HREC2)** via **expedited** review procedures on 04/10/2018 and was approved.

Please note the following information about your approved research protocol:

Protocol Approval Period: **This project has approval for 12 months from the date of this letter.**

Please remember to use your **Project ID [7431]** on any documents or correspondence with the HREC concerning your research protocol.

Please note that the HREC has the prerogative and authority to ask further questions, seek additional information, require further modifications, or monitor the conduct of your research and the consent process.

After Ethical Review

Please note you can submit your progress report through the online ethics application process, available at: Links Application Form Direct Link and the application should be submitted to the HREC before the year has expired. Please see *Forms and Instructions* on our HREC website (www.sun.ac.za/healthresearchethics) for guidance on how to submit a progress report.

The HREC will then consider the continuation of the project for a further year (if necessary). Annually a number of projects may be selected randomly for an external audit.

Provincial and City of Cape Town Approval

Please note that for research at a primary or secondary healthcare facility, permission must still be obtained from the relevant authorities (Western Cape Departement of Health and/or City Health) to conduct the research as stated in the protocol. Please consult the Western Cape Government website for access to the online Health Research Approval Process, see: https://www.westerncape.gov.za/general-publication/health-research-approval-process. Research that will be conducted at any tertiary academic institution requires approval from the relevant hospital manager. Ethics approval is required BEFORE approval can be obtained from these health authorities.

We wish you the best as you conduct your research.

For standard HREC forms and instructions, please visit: Forms and Instructions on our HREC website https://applyethics.sun.ac.za/ProjectView/Index/7431

If you have any questions or need further assistance, please contact the HREC office at 021 938 9677.

Yours sincerely,

Francis Masiye,

HREC Coordinator,

Health Research Ethics Committee 2 (HREC2).

National Health Research Ethics Council (NHREC) Registration Number:

REC-130408-012 (HREC1) REC-230208-010 (HREC2)

UNIVERSITY OF ZAMBIA HEALTH SCIENCES RESEARCH ETHICS COMMITTEE

P. O. Box 50110
Lusaka, 15101
Zambia
Skype: s.munsaka
IRB no: 00011000

IORG no: 0009227

Tel: +260953078410
Tel: +260977925304
E: mail: unzahsrec@gmail.com
s.munsaka@unza.zm
FWA no: 00026270

Protocol ID: 20181016002

20th November, 2018

Ms Loveness Nkhata
University of Zambia
School of Health Sciences
Department of Physiotherapy
Lusaka

Dear Ms Nkhata,

Re: Ethics Approval of Protocol ID Number 20181016002

I write to inform you that your study entitled '***The Effectiveness of a Contextualized Back Pain Campaign for Nurses in Lusaka, Zambia'***, submitted by you as the principal investigator to our research ethics committee has been reviewed under the expedited review process and has been **approved**.

Note that the study approval duration is for one year after which you may renew the protocol. Your renewal date is 19th November, 2019.

The research ethics committee expects to be informed about the progress of the study, any adverse events occurring in the course of the study, any revision of the protocol and participant information sheet/informed consent form and ask to be provided a copy of your final report.

Yours faithfully,

Sody M. Munsaka, BSc, MSc, PhD
CHAIRPERSON

THE NATIONAL HEALTH RESEARCH AUTHORITY
Paediatric Centre of Excellence
University Teaching Hospital
P.O. Box 30075
LUSAKA

Telephone: +260 211 250309 | **Mobile:** +260 95 5632726
Email: znhrasec@gmail.com | **Website:** www.nhra.org.zm

15th January, 2019.

The Principal Investigator
Ms. Loveness Nkhata
University of Zambia
School of Health Sciences
Department of Physiotherapy

LUSAKA

Dear Ms. Nkhata,

RE: REQUEST FOR PERMISSION TO CONDUCT STUDY

The National Health Research Ethics Board (NHREB) is in receipt of your request for permission to conduct a study entitled **"The Effectiveness of a Contextualized Back Pain Campaign for Nurses in Lusaka, Zambia".**

The NHREB has no objection to your request on condition that:

1. **A Material Transfer Agreement is obtained and cleared by the National Health Research Ethics Board should there be any need for samples to be sent outside the country for analysis.**
2. The relevant Provincial and District Medical Officers where the study is being conducted, are fully appraised;
3. Progress updates are provided to NHRA quarterly from the date of commencement of the study;
4. The final study report is cleared by the NHRA before any publication or dissemination within or outside the country;
5. After clearance for publication or dissemination by the NHRA, the final study report is shared with all relevant Provincial and District Directors of Health where the study was being conducted, University leadership, and all key respondents.

Yours sincere,

Prof. Patrick Musonda

Chairperson,

National Health Research Ethics Board

All correspondences should be addressed to the Director and Chief Executive Officer

REPUBLIC OF ZAMBIA

MINISTRY OF HEALTH
LUSAKA DISTRICT HEALTH OFFICE

18th January, 2019

Loveness A. Nkhata (Ms)
University of Zambia
P. O. Box 50110
LUSAKA

Dear Ms. Nkhata,

RE: AUTHORITY TO CONDUCT RESEARCH IN LUSAKA DISTRICT

We are in receipt of your letter over the above subject.

Please be informed that Lusaka District Health Office has no objection for you to conduct research on **"The effectiveness of a contextualized back pain campaign for Nurses in Lusaka, Zambia"**.

Kindly ensure that your findings are shared with the health facility and District Health Office and that the normal operations of the facility are not disrupted.

By copy of this letter, the Medical Superintendent for Chelstone Health Centre is kindly requested to facilitate accordingly.

Yours faithfully

Dr. C. Mbwili-Muleya
Principal Clinical Care Officer
For/DISTRICT HEALTH DIRECTOR

C.c: Medical Superintendent: Chelstone Health Centre
C.c: Public Health Specialist: Chelstone Health Centre
C.c: Chairperson: Sody M. Munsaka, BSc, MSc, PhD - UNZA

School of Health Sciences,
Department of Physiotherapy,
Ridgeway Campus
Box 50110
Lusaka, Zambia.

January 21, 2019.

The Medical Superintendent In-charge,
Chelstone Clinic
Lusaka, Zambia.

Dear Sir,

RE: REQUEST FOR DATA COLLECTION: THE EFFECTIVENESS OF A CONTEXTUALIZED BACK PAIN CAMPAIGN FOR NURSES IN LUSAKA, ZAMBIA.

Kindly receive my request for data collection for my doctoral research project titled "**The Effectiveness of a Contextualized Back Pain Campaign for Nurses in Lusaka, Zambia**."

I am a Zambian PHD student at Stellenbosch University in Capetown, South Africa. I am pleased to inform you that this research project consists of three inter-linked studies which are interdependent. The first study (completed) was a systematic review which synthesized key evidence-based messages included in published back pain campaigns. In the second study (Current) I aim to contextualize the key messages derived from study 1 for Zambian nurses using Focus group discussions at your center Chelstone clinic. Based on the information that will be obtained I will design an educational campaign on self-management education of back for study 3 which will be implemented at Chawama, Chingwere, Chilenje and Kayama first level hospitals among nurses.

Considering the nature of the study, there is minimal risk involved in study 2 as there is no intervention. Please find attached my study protocol and ethical clearance letters from the District Health Office, National Health Research Authority Board, the University of Zambia School of Health Sciences Research Ethics Committee and Ethical clearance from Stellenbosch University for your reference.

I render my sincere and many thanks in advance for your consideration and quick response to this request.

Yours Sincerely,

Loveness A. Nkhata
Cell No: 0966435366

School of Health Sciences,
Department of Physiotherapy,
Ridgeway Campus
Box 50110
Lusaka, Zambia

This is a

September 30, 2018.

The Senior Medical Superintendent,
Chilenje Level 1 Hospital,
Lusaka.

Dear Sir,

RE: REQUEST TO CONDUCT A RESEARCH PROJECT: PROTOCOL ID 20181016002: THE EFFECTIVENESS OF A CONTEXTUALIZED BACK PAIN CAMPAIGN FOR NURSES IN LUSAKA, ZAMBIA.

Kindly receive my request to conduct a research project for my doctoral degree titled "**The Effectiveness of a Contextualized Back Pain Campaign for Nurses in Lusaka, Zambia**."

I am a Zambian PHD student at Stellenbosch University in Capetown, South Africa. My research project consists of three inter-linked studies which are interdependent. The first study (completed) was a systematic review which synthesized back pain messages published in back pain campaigns. In the second study (completed) I contextualized the key messages derived from study 1 for Zambian nurses using Focus group discussions at Chelstone clinic. Based on the information that I obtained I designed a campaign for self-management education of back pain for nurses (study 3) and I aim to use a quasi-experimental design that will allow me to implement the campaign and collect baseline and exit data. The methods of delivery for this campaign include a PowerPoint presentation, posters, stickers, branded pens and mug cups.

Considering the nature of this campaign there is minimal risk involved because the intervention is purely educational and involves use of branded materials only. Please find attached the permission and ethical clearance letters I obtained from DHO, the university of Zambia, Stellenbosch University and the NHRA for your reference.

I render my sincere and many thanks in advance for your support and quick response to this request.

Yours Sincerely,

Loveness A. Nkhata

(Student No: 17326443

Cell no: 0966435366

APPENDIX (M) POWER POINT PRESENTATION

Why explain back pain?

- Back pain is the main cause of activity limitation and disability globally
- It's Most prevalent and burdensome in working populations
- Prevalence of back pain in nurses is high and ranges from 55-84%
- In nurses Back pain is a major concern and cause for the decrease of working efficiency that affects the safety of the patients and their healthcare outcomes

What is back pain?

- IT is a symptom, not a disease
- Pain occurring in the back
- Most common is Low back pain (LBP)
- LBP may also be associated with pain in one/both legs
- Acute and chronic (persistent)

What is the cause of my back pain?

- There is Rarely a specific cause of back pain
- 96% of people non-specific back pain
- Lifting and repeated activities increase the risk of developing back Pain
- Repetitive tasks performed in awkward postures

NOT getting better: what now?

Physiotherapy?-YES

Stay Active Back Campaign

Evidence based physical therapy

- Manual therapy
- Lifestyle advice

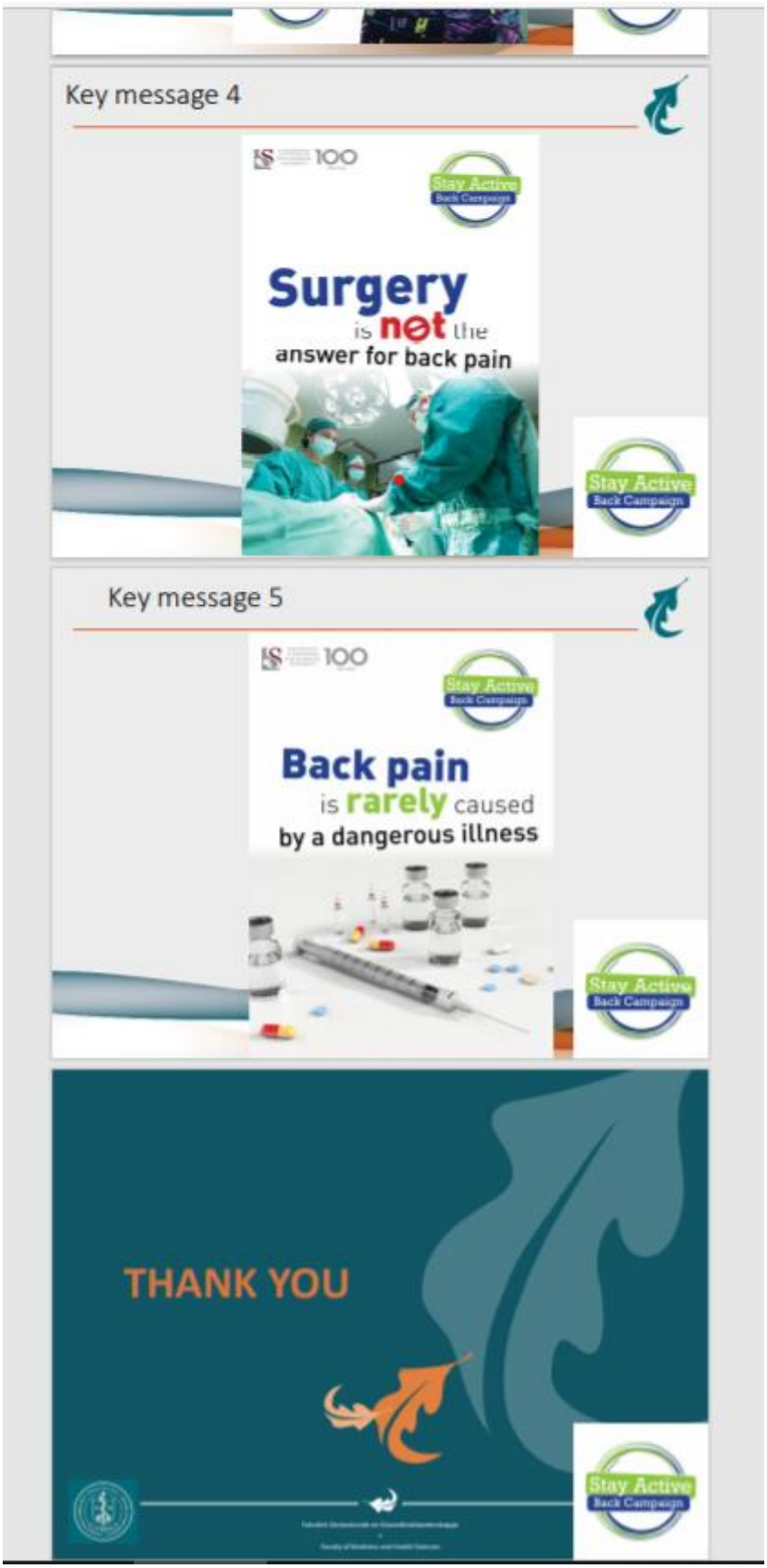
- Graded activity or exercise programme that targets improvements in function and prevention of worsening disability
- Exercise interventions

NOT electrotherapy

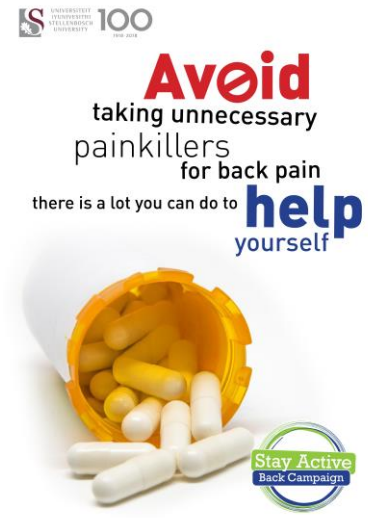
Stay Active Back Campaign

Stay Active Back Campaign

Should I take medicines?



APPENDIX (N) WHATSAPP VOICE OVER VIDEOS

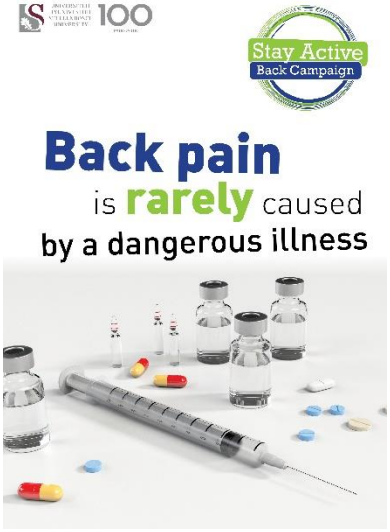


When you have back ache, the goal is to make you feel better, get you moving freely and easily. Avoid taking unnecessary pain killers for back pain there is a lot you can do to help yourself.

Back pain is a personal responsibility, it is up to you to look after your back. Often, lifting and repeated activities performed in awkward postures increase the risk of back aches. You can get help on the right way to do things.

When you have a backache, it is best to continue with your normal everyday activities as soon as you can. Being active and exercising will not worsen your pain. The key to feeling better sooner is to stay active.

Surgery is not the answer for back pain. Most cases of back pain get better on their own within a few weeks. Staying active is the most important way you can help yourself if you have a back ache.



Back pain is a symptom, often the cause of the pain is unspecific but, there is no need for great concern. Stay active, back pain is rarely caused by a dangerous illness.

APPENDIX (O) MANUSCRIPT UNDER PEER REVIEW (International journal of nursing and midwifery)

Back beliefs, coping strategies and participant activation for self-management of back pain among nurses in Lusaka, Zambia.

Loveness A. Nkhata (https://orcid.org/0000-0001-8388-8188)[1,2]

Yolandi Brink (https://orcid.org/0000-0002-4904-9433)[1]

Dawn Ernstzen (https://orcid.org/0000-0002-3061-7226)[1]

Quinette A. Louw (https://orcid.org/0000-0003-0238-0943)[1]

[1]Division of Physiotherapy, Department of Health and Rehabilitation Sciences, Faculty of Medicine and Health Sciences, Stellenbosch University, P.O. BOX 241, Cape Town, 8000 South Africa

[2]Department of Physiotherapy, School of Health Sciences, University of Zambia, Ridgeway Campus, P.O. BOX 50110, Lusaka, Zambia

Email: Lnkhata@yahoo.com

Abstract

Background: In the field of nursing, back pain is the most frequently reported occupational health problem accounting for more than 24 percent of all missing days at work. Meaningful and effective self-management of back pain requires participatory individuals who have the motivation, knowledge, skills and confidence to make decisions and to manage their health. This study aimed to determine the back beliefs, coping strategies and participant activation for self-management of back pain among nurses in Lusaka, Zambia.

Methods: This was a cross-sectional study design and data was collected using a self-administered questionnaire which had items on back beliefs and participant activation. Data was analysed using descriptive statistics in Stata version 20.0 for windows. Characteristics of back beliefs, participant activation measures and coping strategies were described using relative frequencies and percentages. Testing of association for participant activation was done using odds ratios at 5% statistical significance level.

Results: The majority (69.4%) of the participants had experienced back pain ≥ 12 months which lasted between one to three days for half of the participants (50.4%). Furthermore, 72% did not believe in exercise for back conditions, and 81% were uncertain about the prevention of back pain.

Moreover, 81.6% participants used pain medication to manage and cope with back pain. In addition, age p-0.0063 (OR=2.14; 95%CI 1.24 – 3.37), gender p-0.0008 (3.82; 95%CI 1.75 – 8.34), work-setting p-0.04378 (OR=1.82; 95%CI 1.75 - 8.34), back pain experience p-0.0001 (OR=6.75; 95%CI 2.63 – 17.39), number of leave days, p-0.0050 (OR=2.30; 95%CI 1.28 – 4.14) and number of doctor visits p-0.0383 (OR=1.78; 95%CI 1.03 – 3.08) were statistically significant with participant activation for self-management of back pain.

Conclusion: Participants' coping strategies for back pain were linked to the conveyed back pain beliefs which demonstrated that they did not believe in exercise for back conditions. Instead, participants believed in rest and lengthy periods of time off work for back pain. Nonetheless, participants acknowledged that being responsible for back care and taking an active role is important in determining their health and function. This highlights the importance of self-management support for health behaviour change among nurses.

Key words: Back pain; nurses; self-management; participant activation.

1.0 INTRODUCTION

Back pain is a highly significant health concern in the field of nursing and the most frequently reported occupational health problem accounting for more than 24 percent of all missing days at work (Dressner & Kassinger, 2018). Back pain in nurses recurs frequently because of repeated manual patient handling activities such as, transferring and repositioning, working in awkward positions and moving equipment (Samaei et al., 2017; Tosunoz & Oztunc, 2017). Increased numbers of sick days per year, premature retirement and poor health have been reported as consequences of back pain among nurses (Dressner & Kassinger, 2018; Samaei et al., 2017; Tosunoz & Oztunc, 2017)

Back pain among nurses in low- and middle-income countries (LMICs) is common, with prevalence rates ranging between 34-90% (Dlugwane Voce & Knight, 2018; Iyaric, Aboi & Madaki, 2018; Johnson & Emmanuel, 2016; Abolfotouh et al., 2015; Nkhata et al., 2015; Abedini et al., 2014). This high prevalence in LMICs is of major concern as it reduces occupational efficiency, healthcare outcomes and exerts economic costs and strain on the health system (Alnaami et al., 2019; Richardson et al., 2019; Gim, 2017). Back pain is also associated with an

increased risk of chronic disease that can lead to a loss of functional health status and a loss in workforce size and expertise (Alnaami et al., 2019).

In low resource settings such as Zambia, lack of human resources; poor ergonomics; high workload; long hours of service delivery; and inadequate and inappropriate equipment to perform nursing tasks are context-specific factors that have been associated with back pain among nurses (Nkhata et al., 2020). Consequently, nurses with back pain have impaired physical, social, and mental well-being, which is exacerbated by limited possibilities for job modification, low levels of education about back care, low social support, poor working conditions and poor job satisfaction (Dlungwane, Voce, & Knight., 2018). In addition, social, cultural and economic contextual factors negatively impact on the experience of back pain among nurses, leading to impaired quality of life because of loss of functional and economic freedom as nurses may be unable to attend fully to their social and occupational activities (Dressner & Kassinger, 2018; Samaei et al., 2017).

An important factor that may also influence the loss of functional activity and economic freedom is the individuals' beliefs about their back pain experiences (Grøn et al., 2019). Negative back beliefs have been associated with history of pain, care-seeking behaviour and poor outcomes that in turn increase the levels of pain and disability (Ahmed et al., 2018). It has been suggested that negative beliefs about back pain predict the recovery rate and have been associated with a persistently high back pain intensity (Ahmed et al., 2018). Coping with pain is an important element that plays an important role in managing a chronic condition. It means making cognitive and behavioural efforts to control the external and internal demands which a person considers as aggravating or exceeding their resources (Cabak et al., 2015). Further, behavioural efforts are measures that are taken to reduce pain while, cognitive measures are aimed at finding a distraction (Cabak et al., 2015). To cope with the effects of persistent back pain, nurses usually engage both active and passive strategies. However, pain relief medication is a widely used strategy for most of their nursing lives (Kusma et al., 2019). Although, pain relief medications are important in managing the persistent effects of back pain, they do not constitute the only strategy for back pain management (Traeger et al., 2019). Moreover, the effects of the pain relief medications are short lived and likely to initiate a dependent trend (Staelin, Koneru & Rawe, 2019). The recommended approach is to discourage use of pain medication, steroid injections and spinal surgery, and instead promote physical and psychological therapies (Traeger et al., 2019). This is because these non-

medicine approaches can effectively be used to reduce pain, maintain functional abilities and enhance quality of life (Traeger et al., 2019; Ahmed et al., 2018; Hartvigsen et al., 2018).

Recently, there has been growing awareness that back pain is a long-term condition and that self-management can decrease the burden of this condition (Dickson & McDonough, 2018; Crowe et al., 2010). Self-management has been defined as the tasks that individuals undertake to live with a chronic condition (Patel et al., 2019; Taylor et al., 2016). Further, self-management empowers people to take control of their conditions by using patient education and behaviour change strategies that encourage taking an active role in managing their condition and minimising the impact of the condition on individuals' physical and psychological functioning (Patel et al., 2019; Taylor et al., 2016). Individuals are equipped with the right tools that enable them to understand their health condition and transfer from a passive receiving approach to being in control of their health (Dickson & McDonough, 2018).

Meaningful and effective self-management of back pain requires participatory individuals who have the motivation, knowledge, skills and confidence to make decisions and to manage their health (McCabe et al., 2018; Ahn et al., 2015; Green & Hibbard, 2012). Participant activation based on knowledge and skill is the willingness and ability to take independent actions to manage one's health and healthcare (Green & Hibbard, 2012). Participant activation has shown to be consistent to self-management behaviours and health-related outcomes. Hence, in the current healthcare efforts, it has been recognised as an increasingly important strategy in improving back care (Ahn et al., 2015; Green & Hibbard, 2012). It is believed that highly activated participants have the knowledge and confidence to act appropriately to maintain or improve their health. Moreover, people who are more activated are significantly more likely to engage in self-management compared with those that are not (Ahn et al., 2015). Enhancing self-management to maintain a meaningful life, preserve health and minimise the effects of back pain injuries is crucial for nurses not only because back pain affects the health of nurses but also the quality of healthcare they provide to the community (McCabe et al., 2018). To support self-management of back pain in the field of nursing, it is vital to have insight in the prevailing back beliefs, level of activation for self-management and coping strategies of back pain among nurses. Hence, this study aimed to determine the back beliefs, coping strategies and participant activation for self-management of back pain among nurses in Lusaka, Zambia. It was believed that having insight into the nurses' back beliefs and their coping strategies for back pain would help to develop appropriate evidence

based strategies that would be practical in augmenting the abilities of self-management of back pain in the nursing profession.

2.0 MATERIALS AND METHODS

Study design

This was a cross-sectional study design which aimed to determine the back beliefs, coping strategies and participant activation for self-management of back pain among nurses in Lusaka, Zambia.

Sample size and sampling

The study population comprised all nurses who were working in level one public health facilities regardless of whether they had or did not have back pain at the time of data collection. In accordance with literature (Richardson et al., 2019; Gim, 2017) most nurses will experience back pain at some point of their adult life. Thus, the main outcomes were appropriate for all nurses, irrespective of pain at the time of the study. There are four level one public health facilities in Lusaka and approximately 460 serving nurses in total at all four facilities (LDHO, 2018). These facilities provide health services to both in and outpatients including public health programmes at peri-urban community level (LDHO, 2018). We adopted a population sampling method as all four level one institutions in Lusaka were enrolled in the study.

The principal nursing officer's registers were used to identify and recruit registered nurses, enrolled nurses, midwives, public health nurses, theatre nurses and nurse managers who were available and serving in the various departments at the time of data collection. The participant eligibility criteria comprised enrolled nurses, registered nurses and nursing managers from level one public health facilities in the peri-urban areas of Lusaka.

Data collection instruments

A self-administered instrument, based on the compilation of existing validated questionnaires (back beliefs questionnaire and participant activation measures), was used to collect data on back pain history, back beliefs and participant activation for self-management of back pain. All items on back beliefs and participant activation were adopted from the Back Beliefs Questionnaire

(Dupeyron et al., 2017; Bostick et al., 2013) and the Patient Activation Measure (Hibbard and Gilburt, 2014; Insignia health, 2013).

The Participant Activation Measure is validated for assessing patient engagement in the management of chronic conditions such as back pain. It contains 13-item statements to which the participants indicate their level of agreement on a four-point scale from strongly disagree to strongly agree (Hibbard & Green, 2012). The responses give a raw score from 13 which is calibrated to a total score of between 0 and 100 (Insignia Health, 2017). A high score indicates that the participants are more activated to adopt and maintain healthy behaviours and self-management of their condition (Hibbard & Green, 2012).

The Back Belief Questionnaire (BBQ), measures attitudes and beliefs about back pain (Bostick et al., 2013). The questionnaire has 11 statements on a 5-point scale (1=agree to 5=disagree) and respondents indicate their degree of agreement with each of the statements. A higher score indicates a more positive belief about low back pain, suggesting better ability to cope with low back pain. The psychometric properties for both these questionnaires have been validated and used in the general public in similar studies (Gross et al., 2010; Waddell et al., 2007; Werner et al., 2007) and are appropriate for people without tertiary education. Therefore, it was expected to be valid for nurses who had tertiary level of education.

Data collection procedures (including piloting of the measurement tool to assess understanding)

- **Piloting of instrument**

  To ensure the cultural appropriateness of the questionnaire, it was piloted among twenty nurses to ascertain cultural understanding and interpretation of the questions in a non-participating public health facility. The results of the pilot study indicated that participants had the ability to comprehend the instructions and understand the questionnaire items, sequence of questions and the flow of statements. Time taken (10-15 mins) to complete the questionnaire was observed and any typographical errors on the format, font and layout of the questionnaire were noted and corrected.

- **Procedure for main study**

  To accomplish the study objectives, we collected demographic data in section A, participants' back pain history in section B and data on participant activation for self-management of back pain in section C. The questionnaire was semi-structured and self-administered which made it feasible for the participants to complete it during their free time.

Data analysis and outcome measures

Data was analysed using descriptive statistics in Stata version 20.0 for windows. Characteristics of back beliefs, participant activation measures and coping strategies were described using relative frequencies and percentages. Testing of association for participant activation and factors such as demographic variables (age, gender, work-setting), back beliefs, number of back pain days and doctor visits was done using odds ratios at 5% statistical significance level. The outcomes for participant activation were defined as 50% cut-off for poor activation and good activation for self-management of back pain. Those participants scoring 50 and above were considered as having good activation while those below 50 had poor activation levels. The other exposures were defined as follows:

- **Older age**

Age was categorised into *less than or equal to (≤) thirty* and *greater (>) than thirty years*. The exposed were those in the > 30 years category and the unexposed were ≤ 30 years. Age was considered as an exposure because functional capacities, mainly physical, show a declining trend after the age of 30 years, and the trend can become critical after the next 15–20 years if the physical demands of work do not decline (Ilmarinen, 2001).

- **Female gender**

Gender was either *male* or *female*. Being female was exposure while male was unexposed. This is because Aittomäki and company (2005) specify that physically demanding work is associated with difficulties to cope with daily tasks especially among women employees in health and social care. In addition, among women physical workload is strongly associated with limitations in daily activities than among men (Aittomäki et al., 2005).

- **Working in an inpatient ward setting**

Work-setting was divided into *wards* as exposed and *OPD* services as unexposed. This is because the organisational culture of the work unit has been shown to be related to the occurrence of back pain (Cilliers & Maart, 2013). It was assumed that working with dependent patients on the wards had more physical tasks compared to OPD services.

Other exposures were linked to history of back pain in association with participants' activation for self-management and included: having had back pain, back pain experience, number of back pain leave days and number of doctor visits due to back pain. These exposures were defined as:

- **History of back pain**

This was divided into *back pain experience (experienced back pain in the last 2 months)* as exposed and *no back pain experience* (in the past 6 -12 months) as unexposed. It was considered that back pain experience would kindle more activation than having no back pain experience.

- **Higher number of back pain leave days**

Exposed was defined as having obtained *leave of ≥ 3 days* as a result of back pain while obtaining *leave of < 3 days* was unexposed. It was considered that those with leave of ≥ 3 days were more likely to be activated compared to those with less leave days.

- **Higher number of doctor visits due to back pain**

Visiting a doctor for *≥ 3 times* was considered exposed whereas visits *< 3 times* were unexposed because it was assumed that those with more doctor visits were more likely to be activated than those with fewer doctor visits.

Ethics

Ethical approval and clearance for this study was obtained as part of a bigger project entitled; The effectiveness of a contextualised back pain campaign for nurses in Lusaka, Zambia from the Stellenbosch University Health Research Ethics Committee (Reference #: S18/06/125s; Project ID:7431); the University of Zambia Health Sciences Research Ethics Committee (Protocol ID: 20181016002), the National Health Research Authority, the Lusaka District Health Office and the

participating Health Centres. Informed consent was also obtained from individual participants before data collection.

3.0 RESULTS

3.1 PARTICIPANTS' DEMOGRAPHIC DESCRIPTIONS

Three hundred and thirty seven (337) participants took part in the study. The most common age range for the participants was 26 – 30 (34.7%). Outcomes also show that 88.4% of the participants had attained diploma level of education. Further, 71.5% had ≥ 5 years' work experience. Table 1 gives detail on the participants' demographic descriptions.

Table 1: Participants' demographic descriptions (n = 337)

Participants' demographic descriptions (n=337)				
		Male (103) n (%)	**Female (234) n (%)**	**Total n (%)**
Age	≤ 20 21 – 25 26 – 30 31 – 35 ≥ 35	2 (40) 28 (31.4) 37 (31.6) 16 (15.3) 4 (18.1)	3 (60) 82 (92.1) 80 (68.3) 88 (84.6) 18 (81.8)	5 (1.4) 89 (26.4) 117 (34.7) 104 (30.8) 22 (6.5)
Level of education	Certificate Diploma BSc. Degree MSc. Degree	0 (0) 84 (28.1) 3 (12) 0 (0)	12 (100) 214 (71.8) 22 (88) 2 (100)	12 (3.5) 298 (88.4) 25 (7.4) 2 (0.5)
Work experience	≤ 5 years ≥ 5 years	65 (35.9) 22 (9.1)	116 (64) 221 (91.7)	181 (53.7) 241 (71.5)
Work department	Medical/surgical wards Maternal & paediatric health OPD, Anti-Retroviral Treatment & Public health	46 (34.3) 0 (0) 39 (31.4) 2 (16.6)	107 (79.8) 48 (100) 85 (68.5) 10 (83.3)	153 (30) 48 (14.2) 124 (36.7) 12 (3.5)

3.2 PARTICIPANTS' BACK PAIN HISTORY, SICK-LEAVE DAYS AND DOCTOR VISITS

Data collected on back pain history shows that 69.4% of the participants had experienced back pain ≥ 12 months during their work experience as nurses which lasted between one-three days for half of the participants 50.4%. In addition, outcomes show that two months before the current survey, 43.6% participants had back pain experience and 64.4% visited a doctor as a result of the back pain. To that effect 62.7% of the participants obtained sick leave which lasted for three-four

days. Details on participants' back pain history, sick-leave days and doctor visits are presented in table 2.

Table 2: Participants' history of back pain (N=337)

Back Pain History	**n**	**%**
≥ 12 months	234	69.4
2 months before the current survey	147	43.6
No back pain	103	30.6
All sick leave obtained two months before current survey		
Yes	79	23.4
No	258	76.6
Sick leave due to back pain obtained two months before survey (n=79)		
1-2 days	15	22.4
3-4 days	42	62.7
>4	10	14.
Number of days back pain lasted participants with back pain history (n=234)		
1-3 days	118	50.4
4-7 days	66	28.2
Over 2 weeks	31	13.2
All doctor visits reported two months before survey (n=160)		
1-3	139	41.2
4-7	18	5.3
8-10	3	0.89
Doctor visits due to back pain two months before current survey (n=123)		
1-2	103	64.4
3-4	18	11.2
> 4	2	1.25

3.3 PARTICIPANTS' BACK BELIEFS MEASURES

Outcomes on participants' back beliefs responses illustrate that 72% of the participants do not believe in exercise for back conditions, and that 79.5% believe in rest for back pain. Similarly, 73% of the participants believed back pain meant lengthy periods of time off work. In addition, outcomes also highlight that 79.5% of the participants considered that medication is the only way of relieving back pain. More details on the participants' back beliefs are displayed in table 3.

Table 3: Participants' back beliefs measures (N=337)

Items within the back belief's questionnaire	Yes (%)	No (%)	No response (%)
1. There is no real treatment for back pain	91 (27)	244 (72)	2 (0.6)
2. Back pain will eventually stop you from working	227 (67.4)	101(30)	9 (2.7)
3. Doctors cannot do anything for back pain	62 (18.4)	270 (80)	5 (1.5)
4. A bad back should be exercised	89 (26)	242 (72)	6 (1.8)
5. Back pain makes everything in life worse	103 (31)	229 (68)	5 (1.5)
6. Surgery is the most effective way to treat back pain	13 (4)	317 (94)	7 (2.1)
7. Back pain may mean you end up in a wheelchair	7 (2)	326 (97)	4 (1.2)
8. Alternative treatments are the answer to back pain	172 (51)	168 (50)	3 (0.9)
9. Back pain means lengthy periods of time off work	247 (73)	88 (26)	2 (0.6)
10. Medication is the only way of relieving back pain	268 (79.5)	67 (19.8)	2 (0.6)
11. Once you have back pain there is always a weakness	189 (56)	139 (41.2)	9 (2.7)
12. Back pain must be rested	268 (79.5)	66 (19.5)	3 (0.9)
13. Later in life back pain progressively gets worse	289 (85.7)	46 (13.6)	2 (0.6)

3.4 PARTICIPANT ACTIVATION MEASURES

Outcomes from the participant activation items (Table 4) indicated that participants were uncertain (81%) about prevention of back pain and they reported to be unable to maintain lifestyle changes (41%) for back healthcare. However, some participants indicated being responsible for back care (64.4%) and taking an active role (66.1%) was important in determining their health and function.

Table 4: Participants' activation measures (N=337)

Items within the participant activation measure	Strongly disagree n (%)	Disagree n (%)	Neither Disag/agree n (%)	Agree n (%)	Strongly agree n (%)
38. When all is said and done, I am the person who is responsible for managing my back			9 (2.7)	217 (64.4)	111 (32.9)
39. Taking an active role in my back care is the most principal factor in determining my health and ability to function		113 (33.5)	3 (0.9)	223 (66.1)	
40. I am confident that I can take actions that will help me prevent or minimise some symptoms or problem associated with back pain	27 (8.0)	85 (25.2)		153 (45.4)	76 (22.5)
41. I am confident that I can tell when I need to get medical care and when I can handle back pain myself				184 (54.5)	153 (46.8)
42. I am confident that I can follow through on medical advice and treatment I need to do at home for back pain				241 (71.5)	96 (28.4)
43. I understand the nature and causes of back pain			26 (7.7)	196 (58.1)	115 (34.1)
44. I know the different treatment options available for back pain	44 (13.0)	110 (32.6)	30 (8.9)	119 (35.3)	34 (10.0)
45. I have been able to maintain the lifestyle changes for back pain that I have made	77 (22.8)	107 (31.8)	122 (36.2)	31(9.1)	
46. I know how to prevent further problems with back pain	168 (49.8)	273 (81.0)	27 (8.0)		
47. I am confident I can figure out solutions when problems with back pain arise		109 (32.3)	33 (9.8)	195 (57.9)	
48. I am confident that I can maintain lifestyle changes like diet and exercise even during the times of back pain		142 (42.1)	65 (19.2)	130 (38.5)	

3.5 PARTICIPANTS' MANAGEMENT AND COPING STRATEGIES FOR BACK PAIN

Most participants used pain medication, followed by bed rest; and 26.5% participated in physiotherapy and exercise to manage and cope with back pain (Figure 1).

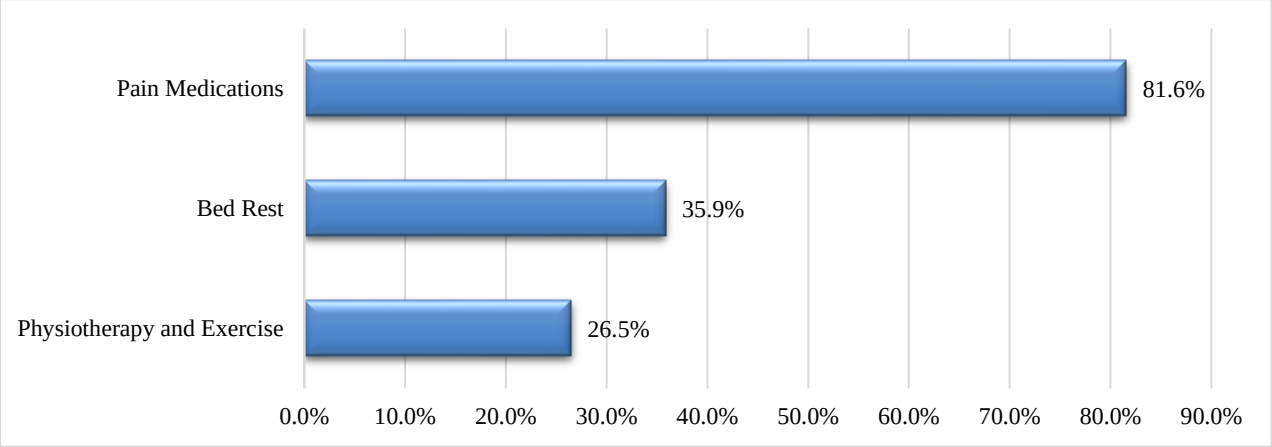


Figure 1: Participants' management and coping strategies for back pain

3.6 DEMOGRAPHIC CHARACTERISTICS AND BACK PAIN HISTORY ASSOCIATED WITH PARTICIPANT ACTIVATION

3.6.1 Participants' demographic characteristics in association with participant activation

As shown in table 5, participant's age p-0.0063 (OR=2.14; 95%CI 1.24 – 3.37), gender p-0.0008 (3.82; 95%CI 1.75 – 8.34) and work-setting p-0.04378 (OR=1.82; 95%CI 1.75 - 8.34) were significantly associated with participant activation for self-management of back pain. The odds ratios imply that those younger than age 30 were two times more likely to have poor levels of activation. For gender, females were almost four times (3.8) more likely to have poor activation while those working in the wards were almost twice (1.8) more likely to have a low level of activation.

Table 5: Participants' demographic characteristics in association with self-management of back pain

	Participant activation of back pain		**Odds ratio (Confidence interval)**	**P-value**
	Good level of activation (good outcome)	**Poor level of participant activation (bad outcome)**		
Age				
Exposed > 30 years	92	34	2.1459	
Unexposed ≤ 30 years	180	31	(1.24 - 3.37)	**0.0063***
Gender				
Exposed: Female	177	57	3.8242	
Unexposed: Male	95	8	(1.75 - 8.34)	**0.0008***
Work-setting				
Exposed: wards	155	46	1.8275	
Unexposed: OPD	117	19	**(**1.75 - 8.34**)**	**0.0437***

significant at 0.05% level

3.6.2 Participants' history of back pain in association with participant activation

In table 6, outcomes show that back pain experience p-0.0001 (OR=6.75; 95%CI 2.63 – 17.39), number of leave days obtained p-0.0050 (OR=2.30; 95%CI 1.28 – 4.14) and number of doctor visits p-0.0383 (OR=1.78; 95% CI 1.03 – 3.08) had a significant association with participant activation. Those without back pain experience were six times more likely to have poor level of participant activation. While, obtaining sick leave of less than 3 days was two times more likely to have poor level of activation and doctor visits of less than 3 days was almost two times (1.7) more likely to have poor levels of activation.

Table 6: Participants' history of back pain in association with self-management of back pain

	Participant activation of back pain		Odds ratio (Confidence interval)	P-value
	(Good level of activation (good outcome)	Poor level of participant activation (bad outcome)		
Back pain history Expose: Back pain experience	174	60	6.76 (2.62 – 17.39)	**0.0001***
Unexposed: No Back pain experience	98	5		
Number of back pain leave days Exposed: ≥ 3 days	55	24	2.30 (1.28 – 4.14)	**0.0050***
Unexposed: < 3 days	217	41		
Number of Dr. visit due to back pain Exposed: ≥ 3 times	92	31	1.78 **(**1.03 – 3.08**)**	**0.0383***
Unexposed: < 3 times	180	34		

significant at 0.05% level

4.0 DISCUSSION

Back pain in the nursing profession is a significant health concern that is associated with increased activity limitation that affects patient care activities (Nkhata et al., 2020; Dlungwane, Voce & Knight, 2018; Johnson & Emmanuel, 2016). Therefore, having awareness about the nurses' back beliefs, their coping strategies and participant activation levels for self-management of back pain is essential in developing appropriate strategies that would augment the abilities of back pain management in the nursing profession.

This is the first study to report on the back beliefs, coping strategies and participant activation for self-management of back pain among nurses in Lusaka, Zambia. Outcomes on back beliefs obtained in this study illustrate that participants did not believe that exercise is useful for back pain. Clinical guidelines serve to reduce the use of low value care and beliefs about back pain management (Carneiro, Bunzli & O'Sullivan, 2020). Beliefs are modifiable and are therefore considered an important strategy to target in the management of back pain (Carneiro, Bunzli & O'Sullivan, 2020; Søren et al., 2019). Addressing negative beliefs and knowledge about pain through education is key because it helps to change perceptions and may reduce disability, enhance coping in individuals with back pain. Of further concern is that 79.5% of our participants believed that rest and lengthy periods of time off work is useful for back pain. This finding concurred with

a South African study which also reported that participants opted bed rest after developing back pain and believed that activities that causes pain should be avoided until the pain has completely alleviated (Cilliers & Maart, 2013). This belief contrasts with the advice against bed rest and the recommend graded return to normal activities that is beneficial for the management of back pain (Buchbinder et al., 2018; Forster et al., 2018; Hartvigsen et al., 2018). The only indicator for bed rest of not more than four days is initial symptoms of acute pain which may be radiating down the legs (Urits et al., 2019). Exercise is recognised for its importance to healthy lifestyles, longevity, quality of life, mental health, and the management of many chronic diseases, including back pain (Forster et al., 2018). In addition, the benefits associated with exercise include an improved general attitude, decreased depression, reduced stress as well as a decrease in new occurrences of back problems (Lela & Frantz, 2012). Appropriate exercise during back pain experience is, therefore, essential for maintaining and improving general well-being, strength, flexibility and endurance (Hartvigsen et al., 2018).

Participants' management and coping strategies for back pain reported in this study were equally linked to their conveyed back pain beliefs. Very few participants indicated participating in physiotherapy and exercise to manage and cope with back pain but preferred use of pain medication and bed rest. About 79.5 % of participants in our study revealed that pain medication was the only way of relieving back pain (Table 3). Similar studies, in Saudi Arabia (Abolfotouh et al., 2015) and Nigeria (Sikiru & Hanifa, 2010), also conveyed that nurses often used pain relief medications to relieve their back pain symptoms. Even though pain medication is widely used to reprieve back pain symptoms, current clinical guidelines prioritise non-medical approaches such as physical and psychological therapies for back pain management (Traeger et al., 2019) because analgesic properties are mild, short lived, can become addictive and have many side-effects (Staelin, Koneru & Rawe, 2019). While individuals older than 30 may be less physically active (Ilmarinen, 2001), the majority of the participants were younger than 30 years but preferred rest and the use of pain relief medication to ease back pain symptoms. This may be attributed to lack of adequate time for exercise activities as individuals sometimes run longer shifts to meet the demands of inadequate staffing levels (Nkhata et al., 2020). Nevertheless, guidelines on back pain management recommend non-pharmacological treatment, including education that supports self-management and resumption of normal activities and exercise for those with persistent symptoms (Foster et al., 2018; Qaseem et al., 2017). These guidelines are practical and must be upheld because they encourage prudent use of medication and ensure promotion of functional activity

including work participation (Foster et al., 2018). Thus, the need to change beliefs about back pain in nurses must be emphasised as this will influence a better understanding of back pain and will ensure a better management of back pain symptoms.

Back pain is a common reason for visiting a doctor but often, visiting a doctor increases the risk of taking time off work which is associated with decreased productivity and economic loss for healthcare institutions (Tariq & Toney-Butler, 2020). Absence from work due to back pain accounts for a loss of 764 000 working days annually (Traeger et al., 2019). Outcomes in our study (Table 2) show that many of the participants had experienced back pain that lasted about three days and had visited a doctor and obtained sick leave that lasted for an average of three days. In a related study (Dressner & Kissinger, 2018) 51.8% of registered nurses had back pain experience which resulted in a cumulative 8,730 days-away-from-work. These outcomes show that sick leave as a result of back pain may characterise severe consequences on the health system, such as increasing the workload especially in low- and middle-income countries (LMICs) where inadequate staffing levels in nursing have been reported (Nkhata et al., 2020; Dlungwane, Voce, & Knight, 2018). Furthermore, absence from work may also lead to loss of earnings and unemployment which has the potential of ill effects on individuals and their families (Abolfotouh et al., 2015). It is indisputable that health and well-being is fundamental to health and functional activities to therefore, staying active strengthens muscles and reduces chances of injury, making it easier for one to remain productive because fewer doctor visits and sick-leave days are taken (Hibbard & Gilburt, 2014).

Self-management is an integral part of back pain management (Burd & Hallsworth, 2017). Clinical guidelines for the management of back pain emphasise the importance of adopting self-management approaches through optimisation of pain and lifestyle behaviours for recovery and it demands active roles from patients (Briggs et al., 2011). Moreover, the ability to seek, understand and utilise health information is an important factor in the aetiology of conditions such as back pain (Briggs et al., 2011). It is alleged that poor knowledge may lead to limited self-management skills. Collated responses (Table 4) obtained on participant activation for self-management of back pain in this study indicate that 64.4% participants acknowledged that being responsible for back care and taking an active role is important in determining their health and function. However, 81% participants were uncertain about prevention of back pain and being able to maintain lifestyle changes for back healthcare. This maybe because participants had limited knowledge on self-

management of back pain thereby influencing their seeking, understanding and utilisation of information on back care. In addition, finding reliable information on back pain healthcare options within their local communities could have been dissenting with their beliefs because of the socioeconomic circumstances as this study was conducted in a peri-urban area. This observation underscores the importance of self-management support for health behaviour change among Zambian nurses.

To effectively support and promote self-management of back pain among Zambian nurses, it is important to identify and understand influencing fundamental factors. Our study shows that participants nurses older than 30 years, female gender and working in a ward were significantly associated with lower levels of participant activation for self-management of back pain. These results are similar to those reported in Ethiopia (Mekonnen, 2019) and can be attributed to the nature of working environments and practices of nursing, which is common in many LMICs. The finding regarding female gender concurs with reports that psychological stress can influence their active involvement in the management of back pain (Mekonnen, 2019). Henceforth, encouraging workplace activity interventions such as back control activities for movement control and self-management education may be useful in reducing chances of back pain work disabilities among female nurses. Encouragement and advice for self-management of pain will help increase confidence and self-efficacy to better cope with future pain episodes.

Back pain experience, number of leave days obtained and number of doctor visits in the present study had a significantly lower activation for self-management of back pain. The participants with a history of back pain was almost seven times (Table 6) more likely to have lower activation levels. This maybe associated to the belief that physical activities are harmful for back pain (Traeger et al., 2017) and may eventually lead to a viscous cycle. However, this important finding warrants exploration since odds only provide insight into association, we do not know if this low level of activation is a cause or effect of their back pain. In contrast to a related study (Burd and Hallsworth, 2017) showed that participants with a history of back pain had a degree of acceptance of their back pain problem and confidence that their involvement in management was essential. This finding suggests that individuals with back pain may respond more confidently to the messages of self-management. Hence promoting self-management of back pain among nurses is important in attaining favourable pain-coping skills and strategies. Nevertheless, this must also be promoted among individuals that had no back pain or fewer leave days and doctors' visits to ensure and

maintain functional activities because most nurses will experience back pain at some point of their adult life (Dlungwane, Voce & Knight, 2018; Johnson & Emmanuel, 2016).

Limitations

The results obtained in this study must be considered within the study methods that were used. Self-administered questionnaires were used for data collection therefore response bias must be recognised as a potential risk to internal validity as participants may have answered questions inaccurately or misleadingly for social acceptability. Participants may have also responded to events surrounding their back pain experiences with less accuracy which could be a source of recall bias. Even though similar situations may occur in other settings, it is important to note that participants were sourced from healthcare centres in the peri-urban areas of Lusaka therefore outcomes from this study may only be generalised to similar contexts.

Recommendations for future research

Self-management does not mean leaving individuals on their own to manage their health condition without support but rather empowering them with right tools to understand their condition (McCabe et al., 2018). Furthermost participants were uncertain about back pain and being able to maintain lifestyle changes for back care. Future research should, therefore, explore how self-management programmes for back pain in nurses can be supported. In addition, identifying strategies and factors for behaviour change in nurses in order to guide the development of effective self-management interventions for back pain in the nursing population. Participants with a history of back pain were almost seven times more likely to have lower activation levels. Exploration in this outcome must be made to ascertain whether the low level of activation is a cause or effect of their back pain experiences.

Conclusion

Participants' coping strategies for back pain were linked to the conveyed back pain beliefs which demonstrate that they did not believe in exercise for back conditions. Instead, participants believed in rest and lengthy periods of time off work for back pain. Furthermore, participants alleged that pain medication was the best way of relieving back pain. In addition, participants were uncertain about back pain prevention and being able to maintain lifestyle changes for back healthcare.

Nonetheless, participants acknowledged that being responsible for back care and taking an active role is important in determining their health and function. These observations may be because of limited knowledge on self-management of back pain in that way, seeking, understanding and utilisation of information on back care was negatively influenced. This underscores the importance of self-management support for health behaviour change among nurses.

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CONFLICT OF INTERESTS

None.

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APPENDIX (P) PUBLISHED PAPER: A SYSTEMATIC REVIEW

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AOSIS

Page 1 of 7 Review Article

A systematic review on self-management education campaigns for back pain

Authors:
Loveness A. Nkhata[1,2]
Yolandi Brink[1]
Dawn Ernstzen[1]
Quinnette A. Louw[1]

Affiliations:
[1]Division of Physiotherapy, Department of Health and Rehabilitation Sciences, Stellenbosch University, Cape Town, South Africa

[2]Department of Physiotherapy, School of Health Sciences, University of Zambia, Lusaka, Zambia

Corresponding author:
Loveness Nkhata,
Lnkhata@yahoo.com

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Background: Evidence-based clinical practice guidelines on back pain recommend early management and use of approaches that emphasise self-management, psychological and physical therapies. Lately, mass media campaigns, addressing misconceptions about back pain, have been conducted in developed countries.

Objectives: This study retrieved and synthesised the contents of back pain messages and described the outcomes and effectiveness of the media campaigns.

Method: Seventeen key words and 10 electronic databases were used to conduct a search between February and July 2018. Authors screened titles, abstracts and full-text articles independently to identify eligible studies. Data were reported using narratives because of heterogeneity in the outcomes.

Results: Appraisal of articles was done using the Physiotherapy Evidence Database scale for randomised controlled trials (RCT) (one) or the Joanna Briggs Institute checklist for non-RCT (four). The campaigns were conducted in the general population in Australia, Canada, Norway, the Netherlands and Scotland. The message 'stay as active as possible' increased participants' awareness and influenced their health beliefs and healthcare utilisation behaviours resulting in reductions in sick leave days, work disability, healthcare utilisation and claims.

Conclusion: The back pain campaign message 'stay as active as possible' increased participants' awareness and influenced their health beliefs and healthcare utilisation behaviours. Even though the campaigns were done in high-income countries, their contents and methods are transferable to developing countries. However, their implementation must be tailored and efficient and cost-effective methods need to be explored.

Clinical implications: Providing information on back pain can contribute to significant changes in sickness behaviours and beliefs.

Keywords: back pain; self-management; education; media; campaign.

Introduction

Back pain is a global health challenge and a leading common condition that causes disability and affects especially the working population worldwide (Forster et al. 2018; Hartvigsen, Natvig & Ferreira 2018; Hoy et al. 2010).

Globally, approximately 149 million workdays at a cost of US$100–200 billion are lost because of back pain yearly (Vos et al. 2012). Even though most episodes of back pain recover within a few weeks, most individuals seek care from health institutions which results in an economic burden for both the healthcare systems and the affected individuals (Forster et al. 2018; Hartvigsen et al. 2018; Hoy et al. 2010; Montegomery et al. 2017; Morris et al. 2018). Several strategies such as ergonomic training, environmental engineering, use of devices or equipment and exercise therapy or physiotherapy are used to manage back pain because the aetiology is multifactorial (Friemann et al., 2015; Jaromi et al. 2012; Soon-Lae & Jong-Eun 2010). Nonetheless, evidence-based clinical practice guidelines (Michaleff et al. 2014; Stochkendahl et al. 2018; Qaseem et al. 2017) on back pain recommend early management and use of biopsychosocial active approaches such as back pain media campaigns that promote self-management and functional improvement (Buchbinder et al. 2018; Forster et al. 2018; Hoy et al. 2010). Media campaigns are a health strategy used to deliver health messages to the community (Buchbinder et al. 2008). In addition, they influence population attitudes, beliefs and change in health risk behaviours (Buchbinder et al. 2008). In healthcare, back pain media campaigns address pain coping strategies and biomedical factors using simple evidence-based messages (Buchbinder et al. 2018; Forster et al. 2018; Hoy et al. 2010), including

back pain not being a severe problem, disability from back pain being able to be improved and prevented by positive attitudes and that there is a lot that one could do to help one self (Buchbinder et al. 2008). Notably, these campaigns have not yet been conducted in low- and middle-income countries (LMICs), but have been done in high-income countries (HICs) among the general population with remarkable success in shifting back pain beliefs, decline in worker compensation claims and reduced healthcare utilisation because of back pain (Forster et al. 2018; Hoy et al. 2010; Waddell et al. 2007; Werner et al. 2008). As a result, recommendations have been made for these campaigns to be contextualised and conducted in specific populations (Buchbinder et al. 2018; Forster et al. 2018; Hoy et al. 2010). This is because tailored campaigns promise to be an effective and affordable strategy in mitigating the effects and burden of back pain (Forster et al. 2018). These campaigns seemingly are a promising method for promoting back care in Africa and other developing regions where the projected increase in back pain disability has a negative impact on societal, economical and public health issues. The purpose of this review was to retrieve and synthesise the content of back pain campaigns and describe the outcomes and effectiveness of the campaigns.

Methodology

The preferred reporting items for systematic reviews and meta-analyses (PRISMA) guidelines were used in defining the participants, interventions, comparisons, outcomes and study designs (PICOS).

Eligibility criteria

Intervention studies such as randomised controlled trials (RCTs), quasi-experimental case–control, crossover trials and observational studies published in English were considered for this review. The population of interest was the general public and the intervention was back pain educational campaigns. Comparisons, such as controls not exposed to the intervention, were also considered and outcomes included process and measures such as pain, participant activation measure, number of sick leave days, back pain beliefs measure, frequency of doctor visits and frequency and amount of pain relief medication.

Information sources and search strategy

Using the MEDLINE search strategy, the Cochrane Occupational Safety and Health database, MEDLINE, EMBASE, SCOPUS, Physiotherapy Evidence Database (PEDro), the National Institute for Occupational Safety and Health (NIOSH) database and the International Occupational Safety and Health Information Centre were searched. The search was conducted between October 2017 and March 2018 and it included articles from 1990 to 2018. The search terms included 'educational', 'interventions', 'campaigns', 'treatment', 'self-management', 'musculoskeletal pain', 'back pain', 'BP', 'low back', 'lower back', 'LBP', 'pain', 'injuries', 'management', and 'nurse', 'nurses' and 'nursing'. The authors obtained and screened titles, abstracts and citations identified by the searches and then retrieved full-text articles independently to identify eligible studies published in English for independent selection. In addition, hand searching of relevant journals, bibliographic databases, dissertations and direct communication with authors of included studies was done to obtain clarity. Other resources were reference lists of relevant articles and registers of clinical trials, including the World Health Organisation International Clinical Trials Registry Platform.

Data extraction and analysis

Authors independently performed data extraction on contents of back pain campaign messages from selected articles taking into consideration checks for discrepancies and processing which were resolved by consensus (Higgins et al. 2011). Contents which were retrieved included study method, objectives, participants, intervention type, outcome measures, results, references, intervention messages, mode of transmission and duration. The results from the articles were described descriptively because of heterogeneity.

Methodological appraisal and assessment of risk of bias

Appraisal of the methodology for RCTs was done using the PEDro scale (Verhagen et al. 1998) which assesses external validity (criterion 1), internal validity (criteria 2–8) and statistical accuracy (criteria 9–10). In addition, the scale contains 11 items, scored as Yes/No, which is either present (1) or absent (0). Non-RCTs were assessed using the Joanna Briggs Institute (JBI) appraisal (Tafanaru et al. 2015) which has items that are scored as Yes/No. For risk of bias, the Cochrane risk of bias in non-randomised studies of interventions (ROBINS-I) tool was used (Higgins et al. 2016; Thompson et al. 2018; Sterne et al. 2016). This tool focuses on assessing internal validity using seven specific bias domains which include confounding, selection of participants, classification of interventions, missing data, measurements of outcomes and selection of reported results (Sterne et al. 2016; Thompson et al. 2018). In addition, it contains question items measured on a Likert scale of 'yes' for minimal risk of bias, 'probably yes', 'probably no' and 'no' for elevated risk of bias (Higgins et al. 2016; Sterne et al. 2016; Thompson et al. 2018). These include the following: is there potential for confounding of the effect of intervention in this study; was selection of participants into the study based on participant characteristics observed after the start of intervention; were intervention groups clearly defined; were there deviations from the intended intervention beyond what would be expected in usual practice; were outcome data available for all, or nearly all, participants; could the outcome measure have been influenced by knowledge of the intervention received and is the reported effect estimate likely to be selected, based on the results, from multiple outcome measurements, analyses of the intervention or different subgroups?

Ethical considerations

This review is part of the Project ID:7431 about the effectiveness of a contextualised back pain campaign for nurses in Lusaka, Zambia. Ethical clearance for the project

was sought from the Stellenbosch University Health Research Ethics Committee (SU-HREC) – Project ID: 7431 and HREC Reference #: S18/06/125.

Results

Description of studies

Following electronic searching, 17 potentially relevant articles were identified. Titles, keywords and abstracts of these articles were assessed, and 11 eligible articles were selected and publications obtained. From the 11 eligible articles, five studies were included in our review. Figure 1 illustrates the article selection process.

Methodological appraisal

Appraisal of the methodology for Suman et al. (2017) was done using the PEDro scale (Verhagen et al. 1998) and a score of 6/11 was obtained. For the remaining four articles (Buchbinder et al. 2008; Gross et al. 2010; Waddell et al. 2007; Werner et al. 2007), the JBI appraisal (Tafanaru et al. 2015) was used and items were scored as Yes/No, which is either present (1) or absent (0). The overall score for the four articles was 8/11; details on the appraisal scores for included studies are shown in Tables 1 and 2.

Study sample description

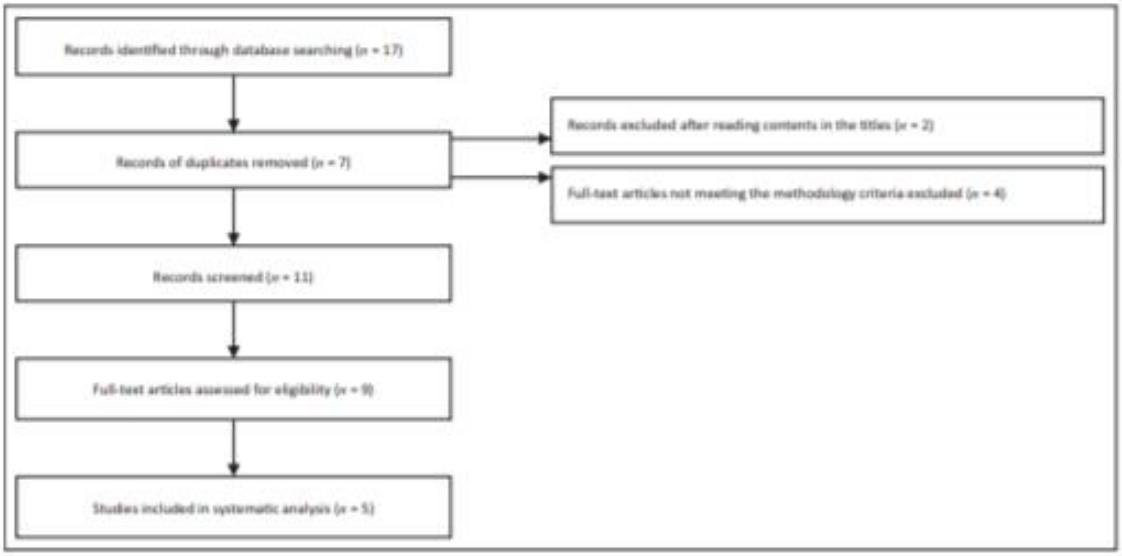
Five full-text reports (Buchbinder et al. 2008; Gross et al. 2010; Suman et al. 2017; Waddell et al. 2007; Werner et al. 2007) on self-management education campaigns of back pain were included in our review (Table 3). Notably, these campaigns were conducted in HICs among the general population in Australia (Buchbinder et al. 2008), Canada (Gross et al. 2010), Norway (Werner et al. 2007), the Netherlands (Suman et al. 2017) and Scotland (Waddell et al. 2007). Methodological designs of the studies included quasi-experimental (Buchbinder et al. 2008; Gross et al. 2010; Werner et al. 2007) before and after observational study (Waddell et al. 2007) and a mixed-methods step-wedge RCT (Suman et al. 2017).

Study interventions content

The back pain media campaign contents on the intervention's messages, mode of transmission and duration for the campaigns are shown in Table 4. Campaign messages were different in the campaigns, but a few messages were similar in some campaigns such as 'don't take it lying down' (Buchbinder et al. 2008; Gross et al. 2010) and 'stay active' were common in the campaigns (Buchbinder et al. 2008; Gross et al. 2010; Suman et al. 2017; Waddell et al. 2007; Werner et al. 2007). Campaign messages were transmitted using television (Buchbinder et al. 2008; Gross et al. 2010; Werner et al. 2007), radio (Buchbinder et al. 2008; Gross et al. 2010; Waddell et al. 2007), bill boards (Buchbinder et al. 2008; Gross et al. 2010; Waddell et al. 2007), workshops (Buchbinder et al. 2008; Gross et al. 2010), celebrities (Buchbinder et al. 2008), newspaper articles (Werner et al. 2007), websites (Gross et al. 2010; Suman et al. 2017; Waddell et al. 2007) and flyers (Buchbinder et al. 2008; Gross et al. 2010; Suman et al. 2017; Waddell et al. 2007; Werner et al. 2007). Duration and follow-up period for four campaigns were 3 years.

Assessment of outcomes

Outcomes and overall effect of the campaigns on awareness, participant activation and satisfaction: Outcomes that were measured in the campaigns are summarised in Table 5. A significant improvement in back pain beliefs in the general population was observed in the Australia ($F = 7.43$; $p < 0.001$),



Source: Authors' own creation for data compilation

FIGURE 1: Article selection process using the PRISMA flow chart.

TABLE 1: Evidence grading scores according to Physiotherapy Evidence Database criteria.

Author	Item 1	Item 2	Item 3	Item 4	Item 5	Item 6	Item 7	Item 8	Item 9	Item 10	Item 11	Score
Suman et al. (2017)	Y	UC	UC	Y	UC	UC	UC	Y	Y	Y	Y	5/11

Source: Authors' own creation for data compilation

Options for signalling questions: Yes (Y), No (N), Unclear (UC), Not applicable (NA).

Items refer, (1) Eligibility criteria were specified; (2) Participants were randomly allocated to groups (in a crossover study, subjects were randomly allocated in order in which treatments were received; (3) Allocation was concealed; (4) The groups were similar at baseline regarding the most important prognostic indicators; (5) There was a blinding of all participants; (6) There was a blinding of all therapists who administered the therapy; (7) There was blinding of all assessors who measured at least one key outcome. (8) Measures of at least one key outcome were obtained from more than 85% of the participants initially allocated to groups. (9) All participants for outcome measures were available and received the treatment or control condition as allocated or, where this was not the case, data for at least one key outcome were analysed by 'intention to treat'; (10) The results of between-group statistical comparisons are reported for at least one key outcome; (11) The study provides both point measures and measures of variability for at least one key outcome.

TABLE 2: Evidence appraisal according to the JBI appraisal checklist for quasi-experimental studies.

Author	Item 1	Item 2	Item 3	Item 4	Item 5	Item 6	Item 7	Item 8	Item 9	Score	Overall appraisal
Gross et al. (2010)	Y	N	Y	Y	Y	Y	Y	Y	Y	8/9	Included
Buchbinder et al. (2008)	Y	N	Y	Y	Y	Y	Y	Y	Y	8/9	Included
Waddell et al. (2007)	Y	N	Y	Y	Y	Y	Y	Y	Y	8/9	Included
Werner et al. (2007)	Y	N	Y	Y	Y	Y	Y	Y	Y	8/9	Included

Source: Authors' own creation for data compilation

Options for signalling questions: Yes (Y), No (N), Unclear (UC), Not applicable (NA).

Items refer, (1) Is it clear in the study what is the cause and what is the effect (i.e. there is no confusion about which variable comes first)?; (2) Were the participants included in any comparisons similar?; (3) Were the participants included in any comparisons receiving similar treatment or care, other than the exposure or intervention of interest?; (4) Was there a control group?; (5) Were there multiple measurements of the outcome both pre and post the intervention or exposure?; (6) Was follow-up complete and if not, were differences between groups in terms of their follow-up adequately described and analysed?; (7) Were the outcomes of participants included in any comparisons measured in the same way?; (8) Were outcomes measured in a reliable way?; (9) Was appropriate statistical analysis used?

Canada (565% – 63%), Norway (21.2% – 22.6%) and Scotland ($p < 0.001$) campaigns (Buchbinder et al. 2008; Gross et al. 2010; Waddell et al. 2007; Werner et al. 2007). However, authors in Canada indicate that although positive outcomes were observed, there was no meaningful statistical significance ($p = 0.13$) on the overall effect of the campaign (Gross et al. 2010).

Back beliefs measure and reported change in back beliefs following the campaigns: The back beliefs questionnaire was used to measure back pain beliefs (Buchbinder et al. 2008; Waddell et al. 2007; Werner et al. 2007). Significant improvements 1.9–3.2 (confidence interval [CI] 1.3–2.5 to 2.6–23.9) in population back beliefs in Australia were observed and sustained even 3 years after the campaign (Buchbinder et al. 2008). In addition, a satisfactory significant reversal (CI 21.2–22.6) in the balance of back beliefs was reported in Scotland (Waddell et al. 2007) while in Canada it was 56% – 63% (Gross et al. 2010).

Health utilisation, back claims and number of sick leave days following the campaigns: The ability to self-manage and better use of X-rays was reported (Buchbinder et al. 2008; Werner et al. 2007). Sick leave days and number of claims for back problems declined over the campaign duration by 5% (Buchbinder et al. 2008). Furthermore, a general decline in the number of sickness days and overall reduction 5% ($p = 0.013$) in claims were observed (Buchbinder et al. 2008). In addition, a generally downward trend was observed: 13% reduction in the proportion of back claims and sick duration (Gross et al. 2010). In contrast, Waddell et al. (2007) reported an 11% downward trend in the number of people who stayed off work.

Frequency of doctor visits and pain relief medication use following the campaigns: Buchbinder et al. (2008) reported a significant 15% – 20% reduction in the frequency of doctor visits related to back pain, but remained silent on the use of pain relief medication. Similarly, other campaigns were silent on the frequency of pain relief medication use and did not report the frequency of doctor visits (Gross et al. 2010; Suman et al. 2017; Waddell et al. 2007; Werner et al. 2007). However, even though no figures were given, Werner et al. (2007) highlight that they observed an increase in the number of surgery rates in both intervention and control counties, but observed no increase in referrals for imaging examination in the intervention county compared to the control.

TABLE 3: Characteristics of included studies.

Author	Campaign	Objective	Study design
Suman et al. (2017)	eHealth media campaign	Evaluated process of a multimedia campaign to improve back beliefs in patients with non-specific low back pain (LBP)	Mixed methods step-wedge RCT
Gross et al. (2010)	Back @ it	Evaluated a back pain mass media campaign's impact on population back pain beliefs, work disability and health utilisation outcomes	Quasi-experimental
Buchbinder et al. (2008)	Back Pain: Don't Take It Lying Down	Aimed at shifting the responsibility of control onto the individual and promoting self-management	Quasi-experimental
Waddell et al. (2007)	Working Backs Scotland	Aimed at changing public beliefs about the management of back pain	Before–after observational study
Werner et al. (2007)	Active back project	Evaluated the effect of a media campaign on popular beliefs about LBP and eventual changes in sick leave, imaging examination and surgery	Quasi-experimental

Source: Authors' own creation for data compilation

RCT, randomised controlled trial.

Work disability outcomes and effects of advice to stay active following the campaigns: In all the campaigns (Buchbinder et al. 2008; Gross et al. 2010; Suman et al. 2017; Waddell et al. 2007; Werner et al. 2007), participants agreed and supported to stay and remain active regardless of back pain. Furthermore, significant shifts in back pain beliefs about staying active among the general population in Canada ($p = 0.001$), Scotland ($p < 0.001$) and Australia (OR 1.9–3.3) remained sustained for the duration of the studies (Buchbinder et al. 2008; Gross et al. 2010; Suman et al. 2017; Waddell et al. 2007).

TABLE 4: Interventions, mode of transmission and duration.

Authors	Suman et al. (2017)	Gross et al. (2010)	Buchbinder et al. (2008)	Waddell et al. (2007)	Werner et al. (2007)
Back pain messages	Stay active, Continuing or returning to work, Coping with back pain.	Back pain: don't take it lying down The key to feeling better sooner is to stay active	Back pain is not a serious problem continue usual activities Don't rest for prolonged periods Continue exercising and remain at work if possible Positive attitudes are important, and it is up to you X-rays are not useful Surgery may not be the answer to keep employees at work	Stay active Try simple pain relief If you need it, get advice Don't take back pain lying down There's a lot you can do to help yourself The prognosis is usually good	Back pain is rarely caused by dangerous illness X-ray rarely reveals the cause of back pain A back in motion improves faster Work with your back, one recovers faster by returning to work as soon as possible Only a few people with back pain need surgery
Mode of transmission	Website, e-videos and pamphlets	Website, radio, bus adverts, posters, pamphlets, billboard, articles in public or industry news publications and TV public service announcements	TV, radio and printed adverts; outdoor billboards, posters, seminars, workplace visits and publicity articles	Website, radio and printed adverts; billboards, posters, seminars, workplace visits and publicity articles	Website, TV, radio and cinema adverts; posters with the campaign messages at health clinics
Duration	2 years (2010–2012)	3 years (2005–2008)	3 years (1997–1999)	3 years (2000–2003)	3 years (2002–2005)

Source: Authors' own creation for data compilation

TABLE 5: Outcomes and the effectiveness of the campaigns.

Author	Campaign awareness	Population back pain beliefs and staying active	Patient satisfaction	Sick leave, healthcare utilisation and imagining use	Medical claims and incidence of claims	Overall effect of campaign
Suman et al. (2017)	Awareness increased with time	Proportions not reported	Satisfaction increased with use	Not reported	Outside study scope	Patient satisfaction increased use of media campaign platform
Gross et al. (2010)	49.2% (Treatment), 38.8% (controls)	Back pain beliefs 56% – 63% ($p = 0.13$) Staying active $p = 0.008$	Outside study scope	Healthcare utilisation reduced	13% Reduction	Proportion of subjects agreeing to stay active increased from 56% to 63% ($p = 0.008$). But no statistically significant effects were seen in sick leave outcomes
Waddell et al. (2007)	60%	($p < 0.001$) Significant reversal in back pain beliefs	Outside study scope	11% Downward trends were observed	Fewer spells days of back pain. No new awards of social security benefits for back disorders	Significant, shift in public beliefs about staying active, 5.5% – 15.7%, $p < 0.001$), but no effect on sickness absence, no new awards of social security benefits for back pain
Werner et al. (2007)	29% – 39% $p = 0.000$	Staying active increased from 21.2% to 22.6%	Outside study scope	13% Reduction on sickness leave days; reduced X-rays use 35% (intervention), 33% (control)	Observed increase in surgery rate claims in both intervention and control	Significant shift in low back pain beliefs in general population, importance of remaining active and at work. Reduced use of X-rays
Buchbinder et al. (2001)	47% – 86%	Staying active 1.9 (CI 1.3–2.5) before to 3.2 (CI 2.6–23.9) ($F = 7.43$; $p < 0.001$)	Outside study scope	15% (Controls) and 20% (intervention) Reduced use of X-rays	Claims reduced by 15% $p = 0.013$	Significant, shift in population low back pain beliefs, behaviour and reduction in workers' medical compensation claims

Source: Authors' own creation for data compilation

CI, confidence interval.

Discussion

This review reports on back pain community-based mass media campaigns. The campaigns included in this review aimed to address misconceptions such the need for rest and activity avoidance when experiencing back pain (Deneen et al. 2017). The campaigns reviewed included messages about physical, psychological, educational and work-related information to address pain, disability and work outcomes (Buchbinder et al. 2018; Werner et al. 2007). The campaign messages were aimed at promoting positive beliefs on back pain, encouraging self-coping strategies and functional activity. The purpose of the campaign messages was to encourage self-care and ownership of healthcare in individuals suffering from back pain.

Four campaigns that assessed the effectiveness of the 'stay as active as possible' message reported a statistically significant positive change. This finding implies that significantly more people were aware that they need to stay as active as possible if they have low back pain and that rest (especially bed rest) is not indicated. This is because rest slows down the natural progress of low back pain and influences work absenteeism (Hartvigsen et al. 2018). The increased awareness to stay as active as possible is therefore an important finding as it has spin-off effects on the prognosis and recovery period as well as financial implications at personal, institutional and national levels, as low back pain is one of the most common reasons for absenteeism (Buchbinder et al. 2018). Although this outcome was self-reported, a proxy measure to support behaviour change in the intervention groups could be reduced sick leave days or claims. Two of the campaigns (Buchbinder, Jolley & Wyatt 2001; Werner et al. 2007) indicated a reduction in sick leave and claims after the campaigns. These campaigns were conducted in HICs, but this message could be critical for LMICs where the belief to rest during low back pain episodes may be widespread among the general population.

Healthcare utilisation also reduced in the four campaigns that measured this outcome (Buchbinder et al. 2008; Gross et al. 2010; Waddell et al. 2007; Werner et al. 2007). Although this outcome was only statistically significant in the Australian campaign, all other campaigns showed a positive trend with respect to healthcare utilisation. The Australian campaign was more comprehensive than the campaigns in the other countries. For instance, they used prime time (on television and radio) to communicate their key messages. In addition, they included well-known personalities to deliver the campaign messages. However, it seems that even

less expensive campaigns (Gross et al. 2010; Waddell et al. 2007; Werner et al. 2007) also had a positive effect on healthcare utilisation and the messages seem to have a positive effect on health seeking behaviours in people who experienced back pain. This is a pertinent finding for LMICs which may not have the resources for very expensive campaigns and have limited healthcare budgets. The message to stay active while experiencing back pain should therefore be considered for planned campaigns in lower resources settings where inefficient healthcare utilisation cannot be afforded.

The reduction in healthcare utilisation because of the back pain campaigns could be amplified by the reduced referral for X-rays shown in the Australia and Scotland campaigns (Buchbinder et al. 2001; Werner et al. 2007) which delivered messages that reduced the focus on spinal abnormalities and X-rays that rarely showing the reason for back pain. This is also indicated in the Lancet series, which highlight that liberal use of imaging does not reduce back pain disability or its long-term consequences. Instead, it triggers additional medical care costs and increases the risk of adverse outcomes, such as absence from work (Hoy et al. 2010). Recovery from back pain is aided by remaining active. Therefore, it is important to align practice with this evidence and especially for LMICs where imaging referral rates may still be high among patients with back pain.

One of the campaigns also reported on process evaluation (Suman et al. 2017). This campaign indicated that evaluation tested the cost-effectiveness and implementation strategy for the campaign. This suggests that process evaluation should be an important initial step when planning similar campaigns as it will assess the feasibility of recruitment, understanding and validity of the selected outcomes of the campaign. Process evaluation is particularly advisable for lower resource countries and regions where little is known about back pain beliefs, healthcare utilisation for back pain and management of back pain. A process evaluation also enables researchers to assess the feasibility of a campaign including barriers and facilitators before launching a more expensive interventional approach.

The campaigns were administered to the general population, and the interventions were clearly defined in all articles. Clearly defined interventions and populations are a good and helpful reference for future and similar research activities. Unfortunately, data outcomes for articles included in this review were not entirely comparable. This is because their focus, messages and data analysis and characteristics were differently done. In addition, there were missing data reports that made comparison and narration of the outcomes very difficult and is also a source of challenges for future research activities especially for resource-constrained areas. The number of articles available on back campaigns is very limited. This, to a great extent, may have impacted and influenced the findings and interpretations for this review. Similar campaigns are therefore recommendable especially in LMICs where these campaigns have not yet been done and the challenge of back pain is projected to increase in the next decade (Hoy et al. 2010).

Conclusion

The review findings show that the back pain campaign message 'stay as active as possible' increased participants' awareness to stay active and influenced positively their health beliefs and healthcare utilisation behaviours. The 'stay as active as possible' message is simple and easy to follow, which demonstrates that well-designed and simple messages have the potential to influence and promote health behaviour change in populations. The back campaigns were conducted in the general population in HICs. Even though their contents and methods are transferable to developing countries and populations frequently affected by back pain, their implementation must be tailored, and efficient; and cost-effective methods need to be explored. This is because back pain campaigns are seemingly an effective method in promoting back care and changing sickness behaviours and beliefs among affected individuals. Furthermore, over time, substantial and logical changes in back pain beliefs may lead to reduced fear and subsequently better self-coping for individuals during back pain episodes.

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Competing interests

The authors have declared that no competing interests exist.

Authors' contributions

This work was carried out in collaboration between all authors. L.A.N. and Q.A.L. designed and wrote the first draft of the article. Y.B. and D.E. managed the literature searches and analyses of the study. All authors read and approved the final article.

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Data availability statement

Data sharing is not applicable to this article as no new data were created or analysed in this study.

Disclaimer

The views and opinions expressed in this article are those of the authors and do not necessarily reflect the official policy or position of any affiliated agency of the authors.

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APPENDIX (Q) PUBLISHED PAPER: NURSES' PERSPECTIVES ABOUT CONTEXT SPECIFIC JOB FACTORS AND COPING STRATEGIES FOR BACK PAIN EXPERIENCES AMONG NURSES IN LUSAKA ZAMBIA

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Nurses' perspectives about context specific job factors and coping strategies for back pain experiences among nurses in Lusaka, Zambia: A qualitative study

Loveness A. Nkhata[1,2*], Yolandi Brink[1], Dawn Ernstzen[1] and Quinnette A. Louw[1]

[1]Division of Physiotherapy, Department of Health and Rehabilitation Sciences, Faculty of Medicine and Health Sciences, Stellenbosch University, P. O. BOX 241, Cape Town, 8000, South Africa.
[2]Department of Physiotherapy, School of Health Sciences, University of Zambia, Ridgeway Campus, P. O. BOX 50110, Lusaka, Zambia.

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Nurses comprise the largest group of the health care workforce and play a central role in patient care activities. This study explored nurses' perspectives about context specific job factors and coping strategies for back pain experiences among nurses in Lusaka, Zambia. An interpretive paradigm qualitative research design was used. Participants were selected using maximum variation including enrolled and registered nurses and nursing administrators. Data was collected using focus group discussions, transcribed verbatim and analyzed using content analysis. All thirty-two participants expressed experiencing back pain, correlated with job related factors. Context related job factors for back-pain experiences comprised workload and work environment factors. Inadequate staffing, high patient load, long work hours, mode of performing tasks, inappropriate equipment and work settings were cited as contributing factors. Pain relief medication, exercises, physiotherapy, dietary supplements and rest were coping strategies used. The study concluded that perspectives about context specific job-related factors for back-pain experiences nurses identified were job-related factors like inadequate human resource, high patient load, long work hours and mode of performing tasks. Raising self-awareness, physical activity, adequate infrastructure, manual handling training in clinical contexts and making changes in workflow are approaches that could minimise the effects of back pain experiences among nurses.

Key words: Back pain, nurses, context factors, strategies, qualitative study.

INTRODUCTION

Back pain commonly limits professional activities in the nursing profession (Richardson et al., 2019). Back pain refers to pain from the upper back to the interior gluteal folds, with or without leg pain (Chan, 2017). The prevalence of back pain among nurse's ranges between 33 and 84% (Alnaami et al., 2019; Richardson et al., 2019; Johnson and Emmanuel, 2016; Nkhata et al., 2015).

This high occurrence of back pain in nurses is of major concern because it is a key cause for absence at work

*Corresponding author. E-mail: Lnkhata@yahoo.com.

concern because it is a key cause for absence at work and a decrease in working efficiency that exerts economic costs and strain on the health system (Alnaami et al., 2019; Richardson et al., 2019). Direct and indirect costs of back pain in terms of quality of life for nurses are enormous (Johnson and Emmanuel, 2016). This is because back pain is associated with an incremental risk of chronic disease that can lead to a loss of functional health status and a loss in workforce expertise (Alnaami et al., 2019; Abedini et al., 2014). The compounded effect of nurses with back pain on the health system and patient outcomes of low resource countries is of great concern; considering that, some patients are highly dependent and may require constant attention from nurses, who because of experiencing back pain, may not be able to adequately perform the healthcare activities needed (Chan, 2017).

In most low resource settings, poor ergonomics and the lack of equipment to perform nursing tasks may be associated with back pain (Dlungwane et al., 2018; Johnson and Emmanuel, 2016). Consequently, nurses with back pain have impaired physical, social, and mental well-being (Abou El-Soud et al., 2014). Sadly, the burden of back pain in developing countries is exacerbated by low levels of education about back care, low social support, staff shortages, poor working conditions and poor job satisfaction (Dlungwane et al., 2018). In addition, social, cultural and economic contextual factors may negatively impact the experience of back pain among nurses. The compounded effect of these factors has an ill effect on the health system, nurses and patient outcomes.

Nurses form the largest group within a country's healthcare workforce and central to patient care. Understanding the perceptions of nurses' back pain is important in identifying intervention strategies that may decrease the scale of the problem. Most published reports in low income countries are focussed on the prevalence of back pain among nurses (Semachew et al., 2018). However, work-related low back pain among clinical nurses was reported in Tanzania (Mwilila and Frantz, 2008). Nonetheless, there are inadequate qualitative studies that have explored the lived experiences on context factors for back pain in the work settings among nurses. The perspectives on preventing musculoskeletal disorders in nurses (Richardson et al., 2019) and the nurses experiences of manual handling in health care (Kay et al., 2015) were reported in Australia. Qualitative methods are useful to study the experiences of nurses within the context of their work settings because informants can provide useful information that can enable one to understand their experiences and generate new information that is important in making decisions. Further, there are inadequate qualitative studies that have been done on context specific factors for back pain experiences among nurses especially in low-income settings (Richardson et al., 2019; Kay et al., 2015; Mwilila and Frantz, 2008). Context specific factors are environmental influences such as experiences that have an impact on the phenomenon under observation (Woolf and Aron, 2013). The aim of this study was to explore the perspectives of nurses about their experience of back pain and context specific job factors and coping strategies. It was believed that understanding the nurses' perspectives on context specific job factors would develop an evidence base from lived experiences of nurses that will be useful in developing practical and effective back pain intervention approaches to promote health and productivity in the work settings.

MATERIALS AND METHODS

Study design

This was a qualitative research design, which used an interpretive paradigm and a phenomenological research approach. An interpretive paradigm is concerned with the understanding of the phenomenon from individual subjective experiences including participant observations during the interviews (Thomas, 2010). While the phenomenological approach in qualitative research focuses on the commonality of a lived experience within a group with the goal of arriving at a description of the nature of a phenomenon (Cresswell, 2013). This approach was useful in this study because it gives voice to participants using decision making techniques (Varga-Atkins et al., 2011). Furthermore, the approach was useful in gaining insight, understanding of stakeholder perspectives and their opinions of back pain experiences for nurses in Zambia.

Participants and sampling strategies

To gain greater insight in the matter under study, participants were selected using a maximum variation sampling approach. Inclusion criteria comprised enrolled and registered nurses including nurse practitioners, nursing managers and administrators from a public facility in the peri-urban area of Lusaka. The facility provides various health services to both in and out patients including public health programmes at community level such as, interventions for common conditions including maternal and child health, HIV and AIDS, tuberculosis, water sanitation and malaria (LDHO, 2017). There are approximately seventy-five nurses working at this facility. To allow identification of common themes amongst a diverse sample the researchers, with the help of the principal nursing officer, identified and recruited registered nurses, enrolled nurses, midwives, public health nurses, nurse managers and administrators who were available at the time of data collection and serving in different departments.

Data collection

A total of three focus group discussions (FGDs) with the aid of a discussion guide, that had semi-structured questions, were used for data collection. The principal investigator (PI) conducted the interviews and an open communication approach was used to ensure that participants communicated their back-pain experiences with ease. The interviews were recorded using an electronic audio recorder and transcribed verbatim by professional transcribers. During the interviews, notes were taken on dynamic emotional aspects such as, reluctance and strong feelings attached to certain opinions or vocabulary used during the FGD. Socio demographic

and work data were also obtained using a self-administered questionnaire before each FGD. Data verification was done during the FGD by asking participants to further elaborate on information and having participants respond to the summary of their responses.

Data analysis

Data analysis was done using Atlas.ti 8 for windows. Each transcript was analysed line by line to facilitate the capture of emergent themes during data collection. The PI checked the accuracy of the transcriptions by comparing the audio recordings with transcripts. The PI and DE independently analysed the transcript from FGD 1, compared codes and created a preliminary code book. Further, analysis involved a process of familiarizing with the data; highlighting significant quotes; expanding the codebook; coding the rest of the data; developing clusters of meaning and sorting categories and linkages to establish themes and sub-themes. This process allowed active engagement with the data and dependability and knowledge was generated using the participant's perspectives that were grounded in the actual data. Conformability was enhanced when the same themes emerged from the data of subsequent focus group discussion transcripts. Quotations of text were extracted into separate documents under thematic headings and checked for consistency with the narrative contents which ensured robust representation of the audio and transcript data. Verification of themes and categories was done by the authors after studying and discussing the transcripts. Data saturation was considered when there were no more new emerging ideas or themes from the data.

Ethics

Ethical approval for this study was obtained as part of a bigger project entitled: the effectiveness of a contextualized back pain campaign for nurses in Lusaka, Zambia from the Stellenbosch University Health Research Ethics Committee (Reference #: S18/06/125s; Project ID:7431); the University of Zambia Health Sciences Research Ethics Committee, the National Health Research Authority, the Lusaka District Health Office and the participating Health Centre. Written informed consent and permission to record the interviews were also obtained from the participants beforehand.

RESULTS

Participants' demographic descriptions

Thirty-two (32) out of forty (40) invited participants took part in the FGDs, 68.8% (n=22) were female. The other eight (8) invited participants were on official assignments at the time of interview. The age range was between 20 and 60 years and the most common age group was 51-60 at 34% (n=11). All the participants were in full time employment and the majority 75% (n=24) were registered nurses. Thirty-seven percent of the participants had undergone specialty training in midwifery and were working in the maternity and neonatal wards. Table 1 gives details on the participants' demographic descriptions.

Interview results

The average time for the recorded interviews was 60 min. All interviews were conducted in the dental department staff room at the health center. This was the participants preferred setting because it was readily available at the time of interviews and within their work premises.

The major themes that emanated from the FGD are outlined in Table 2. These factors are "specific to the context" because they are explicit to these study settings and relate to the information, experiences and incidences as narrated by the participants.

All participants indicated having experienced back pain at one point in the course of their work routines as nurses which has lasted for more than three days for some.

The following elaborates on each theme. Verbatim accounts of participants expressions are presented and illustrations of key statements used have been presented without identifiers beyond 'participant', 'ward', and 'FGD' were the quotes emerged from. Table 3 gives details on the identifiers that have been used.

Participants' perspectives about context specific factors of back pain experiences

Job-related factors

Participants 'perspectives about their back-pain experiences were mostly context specific job-related factors, with workload and work environment as sub-themes. Workload aspects comprised inadequate human resources, high patient load, high number of work hours and mode of performing tasks. Work environment categories comprised inadequate or inappropriate equipment, furniture and setting.

Workload:

(1) Patient load and human resource: Participants regarded high workload, which involved a high patient load on the wards and outpatient department (OPD) clinics and being inadequately staffed as contributing to their backpain experiences. Participants reported that these demands resulted in exertion because workload on the wards did not warrant them enough time to rest. Additionally, the high demands at work influenced the nurse's ability to pay enough attention to protecting their back and it influences the quality of service rendered.

"The workload is too much, sometimes there are just too many patients, and maybe only one nurse is taking care of them so, from just doing the nursing of those patients, the back really gets painful." Female part; Maternity ward, D1

"I would like to add on work overload, sometimes you

Table 1. Participants demographic descriptions.

Variable	Frequency	%
Gender		
Male	10	31
Female	22	68.8
Age at last birthday		
20-30	6	18.8
31-40	7	21.8
41-50	7	21.8
51-60	11	34
Work status in the last 12 months		
Full time	32	100
Part time		
Work setting		
General ward	4	12.5
Medical/surgical ward		
Maternity and neonatal ward	15	46.9
ART clinic	4	12.5
OPD clinic	8	25
Qualifications		
Certificate	5	15.6
Diploma	24	75
Bachelor's degree	3	9.4
Master's degree		
Doctorate		
Specialty training		
Midwifery	12	37
Theatre nursing		
Critical care nurse		
Paediatric nursing		
Public health nursing (ART)	5	15.6
Number of work hours per week		
< 40 h	4	12.5
40 h	21	65.6
>40 h	7	21.8
Years of professional experience		
5-10	13	40.6
11-20	5	15.6
21-30	9	28
31-40	5	15.6

work alone, on the ward and we don't have enough timeto rest by the time you are knocking off your back and your feet are paining. The patient nurse ratio should really be adhered to because nurses are seeing more patients than they're supposed to." Female part; Admission ward, D2

Table 2. Context specific factors about back pain.

Theme	Sub-theme	Category
Job-related factors	Workload	Human resource
		Patient load
		Number of work hours
		Mode of performing tasks
		Posture
		Lifting techniques
	Work environment	Equipment
		Furniture
		Setting
Coping strategies	Active coping strategies	Lifestyle
		Exercise
		Diet
		Education
		Stress management
		Physiotherapy rehabilitation
	Passive coping strategies	Rest
		Medication

(2) Working hours: Participants resounded that the number of working hours spent on the wards and in direct patient care were too long especially during night duty and the morning to afternoon (07:30 to16:00 h) shift because nurses stand for very long periods. According to the participants, these long hours make their work very stressful resulting in back pain.

"During night duty, especially in labor ward, we are working for so many hours, no time to rest not even a bit. You start at 6:00 in the evening and you are standing the whole night up to 6:00 in the morning, by the time it's morning, eish, your back is paining. Female part; Maternity ward, D1

"I have especially when I am doing night duty, we are working for so many hours, no time to rest not even a bit, it's like you go for work, you start at 6:00 pm and you are standing the whole night, by the time it's morning, your back is paining." Female part; Admission ward, D3

(3) Mode of performing tasks: Participants expressed that the mode in which most nursing tasks were performed such as suturing, giving medication and bed bathing was also strenuous and a part of most backpain experiences because these activities demand that they assume awkward postures such as kneeling to attend to patients who maybe laying down on the floor. According to the participants narrations their posture during work, included bending, twisting and lifting which if remains unchecked, contributes to their back-pain experiences.

"The other thing is when we are suturing, we need to sit on a comfortable chair but, we are standing and bending most of the time, the moment you finish you can't even stand up right you can have backache even two or three days." Female part; Maternity ward, D1

"We usually conduct a diverted outreach and we palpate mothers on the ground, so you have to kneel and bend..you go up and about, bending, doing all sorts of things,...then we have a lot of mothers that we are supposed to palpate, so by the end of palpation you have back pain and it lasts for more than three days." Female part; Maternity ward, D2

Participants also echoed that often, because of being inadequately staffed, they were using inappropriate lifting techniques during their work routines. This is because sometimes the wards are very busy and there are no fellow nurses or equipment to assist with the lifting or moving of patients. According to the participants, this makes it very difficult for them to apply lifting techniques because a single nurse must perform the tasks alone.

"The other thing is the lifting techniques and all that exercise. Sometimes we are using the wrong techniques when lifting the patients especially when you are alone

Table 3. Key statements illustrations identifiers.

Identifier	Key statement
'Part'	Participant
'D1'	Focus group discussion 1
'D2'	Focus group discussion 2
'D3'	Focus group discussion 3
'Ward'	Ward
'M'	Male
'F'	Female

you even disregard the proper lifting techniques because you must lift the patient from a wheelchair to a stretcher which is slightly high, or from a bed which is high to a bed which is low." Male part; OPD ward, D1

"…. especially in outpatient's department with shortage…poor lifting techniques are used like when lifting the patients from the bed to the stretcher and stretcher to bed. I find that very straining to the muscles Male part; OPD ward, D3

Work environment:

(1) Work related equipment: Participants narrated that basic equipment such as stretchers or trolleys, required to assist in moving patients during their work shifts, were either inadequate or unavailable in their context. Participants expressed that this increased their chances of experiencing back pain because nurses are forced to lift or move patients using their own body strength which posed a great risk for back injuries for them. Participants expressed that access to the right equipment and regular education about lifting techniques could prevent the occurrence of back pain.

"There is certain equipment that we can use for lifting patients, transferring patients, and all that but we don't have at this institution even just basic trolleys, you have to carry a patient from maybe the vitals table to go and see the doctor or to the bed, and all those add towards the back pain." Male part; OPD ward, D2

"I think especially in patients with staff shortage lifting the patients from the bed to the stretcher and stretcher to bed I find that very straining to the muscles because the equipment that we can use for lifting patients, transferring patients, and all is not there." Female part; Admission ward D3

(2) Hospital or health facility furniture: Participants also voiced that most of the furniture that was being used in the work place was inappropriate for the type of work that they were doing. The specific furniture mentioned was the nurses' workstations regarding chairs and desks that were not ergonomically designed or positioned. Participants mentioned that this made them sit at angles which were very uncomfortable and caused them to experience back pain by the end of the day or a session. Additionally, participants also expressed that the patient's furniture in the wards and clinics were mismatched with the type of nursing activity because they were either too low or too high for them. As a result, this makes them perform most of the nursing tasks using postures that were strenuous and uncomfortable.

"I've noticed that most of our furniture is not appropriate for the type of work that we are doing. It's either too high or too low, uncomfortable so we don't sit in a position which is comfortable, we tend to sit either at an angle so, by the end of a session, we experience a lot of back pains." Female part; Admission ward, D1

"In the antenatal wards also, the beds are too low and as you are bending to do all the things you can get backache." Female part; Maternity ward, D3

"I have also experienced back pain, but the worst was when I was with a patient just almost to deliver. I don't know whether the bed was slightly low or what, but immediately I tried to move, there was a click on my back and that was it." Female part; Maternity ward, D2

"But then of course the other thing is being able to provide adequate and proper furniture and equipment, or the stuff to use so that we do not experience some of these back aches that come about because of lack of proper equipment." Female, part; Maternity ward D3

(3) Work environment/infrastructure: Participants reported a lack of basic facilities such as suitable tea rooms in their work setting. They compared their resting rooms to those of doctors and concluded that nurses had no suitable place to rest, especially during the nightshifts. They expressed that this impacted and contributed to their back pain especially because nurses could only sit to rest on the chairs or tables when there was an opportunity. Participants believed that creating a suitable space was nurses could rest would help relieve stress

and minimise the effects of back pain.

"When I look at the infrastructure, it's like nurses are not considered to say they should have a moment of resting. Doctors are usually given a room where they can rest, but nurses, hey, uh-uh. It's like nurses should not rest at all." Female part; OPD ward, D1

Hospital infrastructure was also revealed to contribute to stress related job tasks. Hospital bed space capacity was limited; however, with the dire need for health care, some patients are admitted, even beyond capacity. The latter resulted in some patients being given floor beds. Consequently, this made performing nursing tasks and movements within the wards difficult because of inadequate space.

"Like in the labor ward, sometimes women come when it's very busy and the beds are full, they deliver on the floor. So, as you are bending to do all the things then you can get backache." Female part; Maternity ward, D2

Coping strategies for back pain

Participants' accounts on coping strategies for back pain experiences indicated that individuals employed both active and passive strategies to manage their back pain. Active coping strategies involved taking personal responsibility for pain management, lifestyle activities such as physical exercises, physiotherapy rehabilitation and stress management and attempts to function despite having pain. Passive coping strategies comprised managing pain using an outside source or rest (Carroll et al., 2002), such as utilizing pain relief medication.

Lifestyle

(1) Exercise and diet: A subset of participants believed in lifestyle coping activities such as exercise, a healthy weight and diet to manage their back pain. Furthermore, participants expressed that they used a healthy diet and taking vitamins to build their bodies in order to cope with the demands of the job.

"When I go back home it's when I deal with the consequences of back pain and that's when I start doing stretches, I make sure I do a bit of jumping and jumping because if I don't that day, I will have terrible back pain." Female part; Admission ward, D1

"If it's light, at least you'll be bending, standing up, bending just like that. We are also looking at bones so the diet we need to take more care……taking calcium supplements, vitamins or fruits in the diet also helps." Female part; TD ward, D2

"Sometimes even the weight, we need to check our weight or the type of food we are eating. Usually, if you are heavy honestly you find even if you are doing a simple procedure will be difficult. We need to watch our diet because of obesity…. obesity is really an enemy to health." Female part; Maternity ward, D3

(2) Physiotherapy rehabilitation: Some participants revealed that they attend physiotherapy and engaged in rehabilitation exercise activities to manage and minimize the effects of back pain. They expressed that being taught the correct exercise which could be done during work, such as proper stretching, would further help them in coping with back pain.

"I do physiotherapy exercises everyday because I noticed that if I don't do physio in the morning, I won't even be able to work. So, I do the exercises that I was taught, but if the pain is too much, I end up seeing the physiotherapist for a few physio sessions so that maybe they massage me a bit, then the pain goes." Female part; Maternity ward, D2

(3) Stress management: Participants in the FGDs mentioned that they were stressed due to work pressures well as financial stressors which contributed to body and back pains. Participants acknowledged that even if they knew about stress management and managed patients with stress, they experienced challenges managing their own stress levels.

"And stress management though we don't know how to manage our stress. We are very good at caring for the patients, but for ourselves, it's not there. You know we are stressed financially, so with stress literally the whole body is aching, but we are not able to manage our bodies adequately." Female part; Maternity ward, D3

Use of pain relief medication and rest

Most participants reported resting and using pain relief medication to cope with back pain. Pain relief medication was the most frequently used coping strategy.

"When you have the back ache, of course what usually happens is you are given pain killers and a sick note to go and rest until you feel better. I feel its part and parcel of the job, it's something that will come and go eventually. So, …I take a couple of Paracetamols or Brufen and continue with work." Male part; OPD ward, D2

"When experiencing the back pain…. that back pain won't finish within a day. It will take you for two to three days, it's still there, unless you take a Panadol, then you will feel like it subsides. And because now we are aging Panadol does not even work so, we take something

heavier…. you go to an extent of taking Diclofenac." Female part; Maternity ward, D3

"I have experienced back pain and even now I have back pain. When I stand, that's when it's even worse. I took a short leave, I thought when I went on a short leave, I will feel better, but the pain is still there and it's like increasing." Female part; Maternity ward, D1

Notably one participant mentioned having changed work departments to cope with the effects of back pain. However, the participant also expressed that this didn't help much, resulting in the participant opting to use pain relief medication on a regular basis. Another participant explained that apart from use of pain relief medication, she also uses an orthopaedic belt to obtain back pain relief.

"I changed, we went to the orthopedics, yah. I'm still having the same pain, now every night I must take a painkiller." Female part; Admission ward, D1

"I keep on taking some painkillers … then my belts every day, I have to put on belts to help me relief the back pain." Female part; Maternity ward, D3

DISCUSSION

The nursing profession is an essential and large component of the healthcare workforce. Back pain experienced by nurses can have a negative impact on personal well-being, patient care and health system efficiency and costs. It is therefore important to identify factors that contribute to their back-pain experiences; as this information may play an essential role in developing interventional approaches that can promote well-being (Abedini et al., 2014). This study aimed to explore the perspectives about context specific factors and coping strategies for back pain experiences among nurses, in Lusaka, Zambia.

Findings in this study revealed that nurses perceive several work-related contextual factors to be linked to their experience of back pain. The factors are job-related and work environment. Job-related factors include workload influenced by work hours, human resource and mode of performing tasks, while work environment involves the infrastructure and facility furniture. Aspects of work load which includes reduced human resource, high number of patient load, long working hours and mode of performing tasks were context factors that were identified in this study. The number of working hours spent on the wards and in direct patient care were said to be too long especially during night duty. The mode in which most nursing tasks were performed was described too strenuous because nursing postures during work, includes bending and twisting. These findings are similar to the reported high demands of nursing work in hospitals in Tanzania (Mwilila and Frantz, 2008) and the United States of America (Geiger-Brown et al., 2004). In addition, demanding working conditions such as long hours, heavy lifting and low staffing levels exerted a personal toll that reduced quality of life for nurses even during off hours (Geiger-Brown et al., 2004; Mwilila and Frantz, 2008). High demands, including a wide range of tasks and duties, lack of adequate personnel and lifting heavy objects were also described as problems that increased the probability of experiencing back pain among the nurses in the United Kingdom (Boniface et al., 2016) and Iran (Abedini et al., 2014). Although these outcomes for high income and lower to middle income countries are compared, it is important to note that the work conditions and the contextual factors of these settings may not be comparable (Semachew et al., 2018). For high income countries, the actual conditions and standards for nursing work may be better, compared to those of lower to middle income countries which often operate on limited heath care budgets and are compounded by a higher disease burden (Boughattas et al., 2017).

Awkward postures assumed during work activities including inappropriate and poor lifting techniques were constantly connected with back pain experiences in the present study. This aspect has also been expressed in other studies (Heidari et al., 2019; Mwilila and Frantz, 2008; Geiger-Brown et al., 2004) and is worsened by lack of equipment and poor work settings. Repetitive postures and movements may be a cause of cumulative pressure to the musculoskeletal system causing back pain among nurses. Nurses routinely perform activities such as lifting and transferring patients in/out of the bed or from the floor. These activities are repetitive, labour intensive and involve direct contact with the patients (Chung et al., 2013). In the current study, participants specified assuming awkward postures because the patient beds were either too high or too lower for them and sometimes because of high patient turn-out, some patients were nursed on floor beds. This may suggest that even though postural and handling techniques are taught during training, staff shortages and lack of equipment may make it difficult for nurses to practice the techniques effectively.

Nursing activities assume lots of physical care that involves movement and patient support which sometimes may have unpredictable events due to weight and poor gripping which may lead to injuries for the nurse (Alnaami et al., 2019; Heidari et al., 2019). These outcomes may suggest that there is a mismatch between job activities performed by nurses to meet work demands and their physical abilities or the need for more advanced technologies and/or equipment to assist with the load. However, some of these job activities may be controlled by the individual nurse and could also be corrected through training although; it may not be the ultimate remedy. Therefore, prevention activities must be directed towards enhancing work practice capacity such as

providing educational programs, raising self-awareness and encouraging proper physical activity, stretching exercises, and instructions personal coping strategies in response to back pain experiences (Richardson et al., 2019). The aforementioned factors may allow nurses to have personal control of their work situation and subsequently may decrease the occurrence and severity of back pain injuries. Additionally, increasing the staffing capacity would not only benefit the nurses' health but will also improve the quality of health care services that is provided to patients.

Working environment with regards to equipment, furniture and settings were also identified as being unavailable, inadequate or inappropriate for the type of work that nurses do. Additionally, lack of basic facilities such as tea rooms where nurses could rest was also mentioned as a factor that composited their back-pain experiences. Similar impressions of participants' perspectives about work settings, inappropriate furniture and lack of equipment were also expressed as factors for back pain experiences among nurses in Tanzania (Mwilila and Frantz, 2008). Other studies (Richardson et al., 2019; Abedini et al., 2014) also identified that the absence of hospital equipment particularly for lifting and moving obese patients accounted for the risk of back injury among nurses. These accounts show that work environment, not being functionally adapted for routine tasks that nurses perform, may hinder nurses from putting into practice functional and injury prevention skills they acquire during training. Earlier studies (Richardson et al., 2019; Geiger-Brown et al., 2004) have suggested that problematic work settings faced by nurses may be addressed by redesigning the work place setting, and provision of lifting equipment and appropriate furniture. This approach is recommended because it reduces the risk of back injury by minimizing the demands on the worker if used correctly. Though, in low-income settings this may remain unattainable because of budget constraints and nurses have little or no control over this work situation. But for optimal health and well-being of nurses, it is essential that their work environment be a key budget consideration to warrant redesigning of infrastructure and provision of the appropriate equipment and furniture. Modifying equipment or some features of the working system to reduce risk of back pain injury among the nurses may also be achieved by promotion of multiple approaches in the work place. This would include developing a culture of safety, manual handling training in clinical contexts, making changes in workflow, staffing support to allow teamwork and access to available equipment (Richardson et al., 2019). For low-income settings, these activities are practical as they may draw minimal budgeting. A lack of attention to these important factors may lead to a loss in workforce with a direct impact on patient care.

Participants' coping strategies for back pain experiences demonstrated the use of both active and passive strategies. While use of pain relief medication was widely used, physical exercises, physiotherapy rehabilitation, dietary supplements, stress management and rest were other strategies implored. Other studies have also reported use of pain medication, dietary supplements (Mwilila and Frantz, 2008), stress management, physiotherapy or occupational therapy as coping strategies for back pain (Richardson et al., 2019; Geiger-Brown et al., 2004). These studies also identified the elimination of stooped working positions, a no lift policy and use of lifting teams as strategies for minimizing the effects for back pain (Richardson et al., 2019; Geiger-Brown et al., 2004). Elimination of stooped working positions where nurses are encouraged to sit down at the bedside is achievable in low-income settings and can be enhanced through training. However, because of inadequate staffing levels the nurse and patient ratio at a given time may hinder the performing of nursing activities in sitting position because nurses may work to get their work assignments done. Change of jobs was also a coping strategy that was reported in previous studies (Richardson et al., 2019; Boniface et al., 2016; Geiger-Brown et al., 2004). This option for most low-income settings is not practical because the opportunity for job changes is limited. Using active self-management strategies to cope with back pain especially in low income settings appear to be an approach that can substantially reduce the levels of back pain and disability. This is because active self-management strategies can reduce pain efficacy beliefs, depressive symptoms and fear avoidance beliefs (Crowe et al., 2010). Active coping strategies may also lead to behaviour modification or a change in attitudes, abilities, or coping strategies (Richardson et al., 2019). This may be beneficial in promoting health and well-being among nurses in their work settings.

Notably in this study, some participants echoed that some of their back pain discomforts were due to stress. However, even though they managed other people with stress, they had difficulty in managing and coping with their own stress. Factors like excessive workload, lack of social support and not having enough control over job-related decisions may cause cumulative stress that can interfere with physical health and performance (Segal et al., 2018). This suggests that developing and incorporating support system that would promote physical stress relief such as relaxation and stretch exercise activities in the work settings may help nurses to regain their balance.

Limitations

It is important to note that participants were sourced from one health care centre in the per-urban region of Lusaka. Hence, their perspectives may be specific to their work context and may thus only be generalizable to similar

contexts. The participants reflected on their own perspectives about back pain; and they were exposed to several different other factors that interact which could be the cause of back pain disability. However, even though the outcomes from this study are specific to participants who took part in these study similar situations may occur in other settings.

Conclusion

Nurses identified context specific factors as job-related factors comprising workload factors and work environment factors as the main contributors for back pain. Workload factors were high workload, inadequate human resources, high patient load, long work hours and mode of performing tasks; while environmental factors comprised equipment, furniture and work settings. To cope with back pain, participants used both active and passive strategies such as physical exercises, physiotherapy rehabilitation, dietary supplements, stress management, pain relief medication and rest. To address the problem of back pain in nurses, a multipronged approach involving health care system factors, infrastructure, organisational factors and education is advocated.

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CONFLICT OF INTERESTS

There are no conflicts of interest.

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