



**Evaluation of Health Promotion Roles and Services Offered by
Health Workers in The Nelson Mandela Bay Municipality of
Eastern Cape, South Africa**

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Thesis submitted in fulfillment of the requirements for the degree of Doctor of Philosophy in
Public Health

Discipline of Public Health Medicine, College of Health Sciences

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30 March 2022

“With man this is impossible, but with God all things are possible.”

(Matthew 19:26)

DECLARATION 1: PLAGIARISM

I, Dr Herbert Ikechukwu Melariri declare that

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Publication 1: Under second round review with Preventive Medicine Reports

Herbert I Melariri, Wilma ten Ham-Baloyi, Moses J Chimbari, 2021. The Roles of Primary Care Physicians in Health Promotion and Disease Prevention: A Systematic Review

Authors' Contributions

HM: Conceptualization, Methodology, Software, Formal analysis, Investigation, Data Curation, Writing - Original Draft, Writing - Review & Editing, Project administration, Funding acquisition. WTB: Methodology, Formal analysis, Investigation, Data Curation, Writing - Review & Editing. MJC: Conceptualization, Methodology, Investigation, Data Curation, Writing - Review & Editing, Supervision, Project administration, Funding acquisition

Publication 2: Accepted for publication by South African Family Practice

Herbert I. Melariri, Moses J. Chimbari, Chester Kalinda, 2022. Indicators for measuring health promotion practice among healthcare workers in the Nelson Mandela Bay Municipality, South Africa South African Family Practice Journal <http://doi.org/10.4102/safp.v64i1.5401>

ISBN: 2078-6190

Authors' Contributions

HM: Conceptualization, Methodology, Software, Formal analysis, Investigation, Data Curation, Writing - Original Draft, Writing - Review & Editing, Project administration, Funding acquisition.

CK: Formal analysis, Investigation, Data Curation, Writing - Review & Editing. MJC: Conceptualization, Investigation, Data Curation, Writing - Review & Editing, Supervision, Project administration, Funding acquisition

Publication 3: Published in Preventive Medicines Reports

Melariri HI, Kalinda C, Chimbari MJ. Enablers and hindrances to health promotion and disease prevention practices among healthcare workers in Nelson Mandela Bay Municipality, South Africa. Preventive Medicine Reports 2021; 23:101462 <https://doi.org/10.1016/j.pmedr.2021.101462>

Authors' Contributions

HM: Conceptualization, Methodology, Software, Formal analysis, Investigation, Data Curation, Writing - Original Draft, Writing - Review & Editing, Project administration, Funding acquisition. CK: Formal analysis, Investigation, Data Curation, Writing - Review & Editing.

MJC: Conceptualization, Investigation, Data Curation, Writing - Review & Editing, Supervision, Project administration, Funding acquisition

Publication 4: Published in PLOS ONE

Melariri HI, Kalinda C, Chimbari MJ (2021) Training, Attitudes, and Practice (TAP) among healthcare professionals in the Nelson Mandela Bay municipality, South Africa: A health promotion and disease prevention perspective. PLoS ONE 16(11): e0259884. <https://doi.org/10.1371/journal.pone.0259884>

Authors' Contributions

HM: Conceptualization, Methodology, Software, Formal analysis, Investigation, Data Curation, Writing - Original Draft, Writing - Review & Editing, Project administration, Funding acquisition.

CK: Formal analysis, Investigation, Data Curation, Writing - Review & Editing.

MJC: Conceptualization, Investigation, Data Curation, Writing - Review & Editing, Supervision, Project administration, Funding acquisition

Publication 5: Accepted for publication by BMC Health Services Research

Herbert I. Melariri¹, Chester Kalinda, Moses J. Chimbari, 2021. Patients' views on health promotion and disease prevention services provided by healthcare workers in a South African tertiary hospital

Authors' Contributions

HM: Conceptualization, Methodology, Software, Formal analysis, Investigation, Data Curation,

Writing - Original Draft, Writing - Review & Editing, Project administration, Funding acquisition.

CK: Formal analysis, Investigation, Data Curation, Writing - Review & Editing. MJC: Conceptualization, Investigation, Data Curation, Writing - Review & Editing, Supervision, Project administration, Funding acquisition.

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Date: 30 March 2022

ACKNOWLEDGEMENTS

The conclusion of this thesis has been made possible by the amazing grace of God. He positioned on my path individuals who have immensely contributed to the recorded success.

Firstly, I express my indebtedness to my supervisor, Prof Moses Chimbari. You are indeed a rare gem! You did not only show me that it is possible to enjoy research, but you made me appreciate how ‘contagious’ it could be to love research when close to a dedicated, inspiring, and selfless research supervisor. Your thorough and unbiased critiques were highly cherished!

Secondly, I owe much thanks to the valued expertise of Dr Chester Kalinda. Your statistical input, critiques, and timely feedbacks were amazing. Your contributions did not only enhance the quality of this thesis, but also added to my statistical skills.

I am grateful for the contributions of Dr Wilma ten Ham-Baloyi towards the systematic review and reading through some of the chapters of this thesis with valued critiques.

The administrative roles of Michelle Ramlal, Francis Kanyile, Nokwanda Simphiwe Pearl Majola, and Sambulo Ntombela are most appreciated. Your timely responses on matters requiring your attentions did not go unnoticed.

Special thanks go to my fellow healthcare workers at the Eastern Cape Department of Health. Your contributions to this work by painstakingly completing the survey are appreciated.

Finally, I remain indebted to my wife, Paula, whose support started from the conceptualization of this study to the finish line. Your continued love and patience in reading through the work and making valued contributions remain appreciated. To my children - Favour, Blessing, and David, I thank you all for your patience and prayers. You have often asked, when will this programme end? Your reading of these words is a proof that it has indeed ended. I love you all.

Table of Contents

Declaration 1: Plagiarism.....	iii
Declaration 2: Publications.....	iv
Acknowledgements.....	vii
Abbreviations	xii
Abstract.....	xiv
Overview.....	xv
Chapter 1: General Introduction	1
Chapter 2: Indicators for measuring health promotion practice among healthcare workers in the Nelson Mandela Bay Municipality, South Africa: A cross sectional study.....	54
Chapter 3: Enablers and hindrances to health promotion and disease prevention practices among healthcare workers in Nelson Mandela Bay Municipality, South Africa.....	68
Chapter 4: Training, Attitudes, and Practice (TAP) among healthcare professionals in the Nelson Mandela Bay municipality, South Africa: A Health Promotion and Disease prevention perspective	84
Chapter 5: Patients' views on health promotion and disease prevention services provided by healthcare workers in a South African tertiary hospital	103
Chapter 6: Synthesis, Implications for Practice, limitations, Future Research and General conclusion	124
Annexures	133

List of Figures

Chapter 1

Figure 1: PRISMA flow-chart of systematic review.....	16
Figure 2: Thematic representation of HP and DP strategies by the primary care physician.	17
Figure 3: Flow diagram of research project showing study phases and objectives.....	42
Figure 4: Map of Nelson Mandela Bay Metro.....	44
Figure 5: Sampling methodology of healthcare workers in the NMBM.....	45

List of Tables

Chapter 1

Table 1: Characteristics of included studies	19
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Chapter 2

Table 1: Associations between healthcare workers and facility related indicator dimensions	56
Table 2: Facility Related Indicators' dimension Dimensions at different levels of healthcare	57
Table 3: Facility Related Indicators' dimension associated with Health Promotion in a multivariate analysis.....	60
Table 4: Associations between healthcare Workers (HCWs) and healthcare workers related indicators' (HRI) dimensions.....	61
Table 5: Health workers Related Indicator Dimensions at different levels of healthcare....	62
Table 6: Healthcare workers related indicators' dimensions associated with health promotion in a multivariate analysis.....	63

Table 7: Association between healthcare workers and outcome-related indicator (ORI) dimensions.....	63
Table 8: Outcome Related Indicators at different levels of healthcare.....	64
Table 9: Outcome Related Indicators' (ORI) dimension associated with Health Promotion in a multivariate analysis.....	65

Chapter 3

Table1: Bivariate analysis of association between healthcare workers and health promotion enablers at different healthcare facility levels.....	72
Table 2: Unadjusted and adjusted predictors models on the enablers of HP and DP among health care workers	74
Table 3: Bivariate analysis of association between healthcare workers and health promotion hindrances at different healthcare facility levels.....	75
Table 4: Unadjusted and adjusted multinomial models for hindrances of HP and DP among HCWs.....	76
Supplementary file 1: Correlations between health promotion and disease prevention enablers and healthcare workers.....	79
Supplementary file 2: Correlations between health promotion and disease prevention hindrances and healthcare workers.....	81

Chapter 4

Table 1: Bivariate analysis of training in health promotion and among the different healthcare professional groups.....	91
Table 2: Bivariate analysis of HP and DP training and attitude of HCPs at different levels of healthcare	92
Table 3: Multivariate analysis between HCP and HP training.....	93
Table 4: Bivariate analysis of attitudes towards health promotion and each health care professional group.....	94
Table 5: Multivariate analysis of attitudes towards health promotion.....	95

Chapter 5

Table 1: Bivariate analysis between outcome variable (Who properly attended to you pre-admission?) and predictor variables.....	109
Table 2: Multinomial regression model analysis relating HP and DP services and HCW groups in the PAP.....	110
Table 3: Bivariate analysis between outcome variable (Who properly attended to you during admission?) and predictor variables.....	111
Table 4: Multinomial regression model analysis relating HP and DP services and HCW groups in the ADP.....	112
Table 5: Bivariate analysis between outcome variable (Which HCW group gave you a call post-admission?) and predictor variables.....	113
Table 6: Multinomial regression model analysis relating HP and DP service and HCW groups in POP.....	114

ABBREVIATIONS

ADP	Admission phase
AHP	Allied Health Professional
AHW	Allied Health workers
AXIS	Appraisal tool for Cross-Sectional Studies
BREC	Biomedical Research Ethics committee
CASP	Critical Appraisal Skills Programme
CBP	Community-based placement
CDC	Centers for Disease Control and Prevention
CHC	Community Health Centers
COGTA	Cooperative Governance & Traditional Affairs
CPD	Continuing Professional Development
DHB	District Health Barometer
DP	Disease prevention
EC	Eastern Cape
ECDOH	Eastern Cape Department of Health
FRI	Facility related indicators
GDP	Gross Domestic Product
HCPs	Healthcare Professionals
HCWs	Healthcare Workers
HP	Health Promotion
HPCSA	Health Professions Council of South Africa
HPH	Health Promoting Hospital
HPPA	Health Promotion Provision Assessment
HRI	Healthcare Worker Related Indicators
IMF	International Monetary Fund

ISHP	Integrated School Health programme
LMIC	Low- and Middle-Income Countries
MOU	Midwife Obstetrics Units
NDoH	National Department of Health.
NICD	The National Institute for Communicable Diseases
NMBM	Nelson Mandela Bay Municipality
OECD	Organisation for Economic Co-operation and Development
ORI	Outcome Related Indicators
PA	Physical Activity
PAD	Pre-admission Phase
PCC	Patient Centered Care
PCP	Primary Care Physician
PHC	Primary Health Centre
POP	Post-admission Phase
PRISMA	Preferred Reporting Items for Systematic Reviews and Meta-Analyses
RCT	Randomized Controlled Trials
SAMRC	South African Medical Research Council
SDG	Sustainable Development Goals
SMBG	Self-monitoring of blood glucose
SOP	Standard operating procedure
Stats SA	Statistics South Africa
TAP	Training, attitude and practice
TB	Tuberculosis
UHC	Universal Health coverage
WHO	World Health Organization

Abstract

Background: Various factors affect the role of healthcare workers (HCWs) in health promotion (HP). The Nelson Mandela Bay Municipality (NMBM) public health service is overstretched and there is minimal evidence of health promoting healthcare services. This research project evaluated the roles and services of HCWs on HP as well as the views of patients regarding the HP services they received from HCWs in the municipality.

Methods: A phased quantitative cross-sectional study was conducted to address the study aim and objectives. In phase one, 495 HCWs randomly sampled from 23 healthcare facilities in NMBM completed a structured questionnaire. In phase two, 500 patients completed a structured questionnaire regarding the quality of HP services received using the interview method. Descriptive and inferential analyses were conducted using StataIC 15.

Results: Three groups of indicators classified as facility related indicators (FRI), healthcare workers' related indicators (HRI), and outcome related indicators (ORI) emerged for measuring HP. The study identified thirteen categories of enablers and eight categories of hindrances. Eleven enablers and six hindrances were associated with tertiary hospitals, and none was recorded for the other health care levels. Collaboration among disciplines and organizations (Coeff: 2.16, 95% CI: 1.28 - 3.66) and programme planning (Coeff: 0.375, 95% CI: 0.23 - 0.62) were the predictors of HP and disease prevention (DP) enablers among medical doctors. On the other hand, 'healthcare facilities promoting treatment more than DP' (Coeff: 2.03, 95% CI: 1.30-3.14) and 'absence of practice guidelines incorporating HP' (Coeff: 2.79, 95% CI: 1.66-4.70) were the predictors of HP and DP hindrances among medical doctors and allied health workers (AHWs), respectively. Furthermore, most of the HCWs (75.78%; n=363) reported absence of coordinated HP training for staff in their facilities. Similarly, the attitude that 'HP is a waste of time' (adjusted Coeff 0.51, 95% CI 0.31 - 0.83) influenced the practice for AHWs. Results of the second phase study were categorized into three phases namely - pre-admission phase (PAP), admission phase (ADP), and post admission phase (POP). The ADP showed that patients' health behaviours improved by 1.54 times by their interactions with nurses compared to their interactions with medical doctors.

Conclusion: This study shows that the healthcare system is more committed to biomedical care as against health promotion services at all levels of healthcare. The implementation of HP services requires changes in HCWs behaviour, patients' attitude and very importantly, structural reorganization and reprioritization.

Keywords: Health promotion, disease prevention, healthcare workers, indicators, enablers, hindrances, patients

Overview

Chapter 1 presents the general introduction of the doctoral research which starts with a brief introduction and continues with the background, literature review as well as a systematic review synthesizing the current roles of primary care physicians in the practice of health promotion and disease prevention. The systematic review manuscript is under review with *Preventive Medicine Reports*. The chapter further provided details on the study rationale, aim, research questions, objectives, general methodology and statements on the ethical considerations.

Chapter 2 presents a summary of the elicited indicator categories and their respective dimensions for measuring health promotion activities for HCWs. The findings were further compared across the primary, secondary, and tertiary healthcare levels in the municipality. This manuscript has been accepted for publication by the South African Family Practice as: Herbert I. Melariri, Chester Kalinda, and Moses J. Chimbari 2022. Indicators for measuring health promotion practice among healthcare workers in the Nelson Mandela Bay Municipality, South Africa *South African Family Practice* <http://doi.org/10.4102/safp.v64i1.5401> ISBN: 2078-6190

Chapter 3 identified facilitators and barriers to HCWs practice of health promotion and disease prevention. The results were further segregated to the various levels of healthcare facilities. (published as Melariri HI, Kalinda C, Chimbari MJ. Enablers and hindrances to health promotion and disease prevention practices among healthcare workers in Nelson Mandela Bay Municipality, South Africa. *Preventive Medicine Reports* 2021; 23:101462 <https://doi.org/10.1016/j.pmedr.2021.101462>).

Chapter 4 describes the impact of HCWs training and attitudes on their HP and DP practices and the outcome of comparing these impacts across the various healthcare levels. The results are published in PLOS ONE. <https://doi.org/10.1371/journal.pone.0259884>

Chapter 5 features the outcome of patients' assessment of the quality of HP and DP services they received from HCWs. This manuscript has been accepted for publication by BMC Health Services Research.

Chapter 6: This chapter is a synthesis of the manuscripts constituting the thesis featuring implications to practice, limitations, future research, as well as the general conclusion.

Chapter 1

General Introduction

1. BACKGROUND AND LITERATURE REVIEW

This chapter provides the introduction, background, study rationale, aim, research questions and objectives. The chapter further contains the general methodology, ethics approval and consent to participate.

1.1 BACKGROUND

Health promotion by definition enables people to increase control over, and to improve their health (1). Also known as the Ottawa charter for Health Promotion, the first International Conference on Health Promotion held in Ottawa, in November 1986, and was primarily a response to growing expectations for a new global public health movement (2). Although the conference discussions centred on the needs of the developed world, cognizance was taken of the concerns of the developing countries. The conference made advances on the gains of Alma-Ata declaration on Primary Health Care and emphasized reorienting health services to more health promoting as part of its five cardinal focus areas (2). Sequel to the Ottawa Charter, nine other global conferences on HP has taken place (Annexure 11). More than three decades after, it is unclear if any health gains have emanated from this plan. Evidence from South Africa reveals an overburdened healthcare service. The disease burden comprises mostly of preventable ones. Like the rest of South Africa, the Nelson Mandela Bay Municipality (NMBM) public health service is overstretched and there is minimal evidence of health promoting healthcare services. Although the maiden introduction of health promotion (HP) in the health system of South Africa took place in 1990 (3), research findings showed that Health promotion in South Africa is still in its early stages (3). Furthermore, adequate attention geared towards enhancing the HP of the workforce who are engaged with carrying out health promotion activities is still lacking (3). The National Department of Health's Primary Health Care Re-Engineering Strategy enacted a policy which aims at addressing social determinants of diseases. However, the implementation of the policy at different levels of the health care institutions is yet to be achieved (4). Healthcare workers (HCWs) occupy a vantage position in promoting the health of patients. However, various factors affect their role in health promotion (HP). This research project was aimed at evaluating the roles and services of health workers on health promotion in the NMBM as well as eliciting the views of patients regarding the HP services they received from healthcare workers in the municipality.

1.2 LITERATURE REVIEW

The literature review has a narrative component complemented by a systematic review presented as a manuscript (Systematic review submitted to Preventive Medicine Reports).

1.2.1 Healthcare Workers and Health Promotion

“Health promotion is the process of enabling people to increase control over, and to improve their health” (1). From the Ottawa charter of 1986, the World Health Organization (WHO) emphasised “reorientation of healthcare services” to be more health promoting in nature as part of her five focus areas towards population health (2). Despite this and repeated calls from other stakeholders in the past four decades, evidence shows a continued imbalance between biomedical care and health promotion activities (5–7). Globally, HCWs are strategically positioned to influence the course of health outcome (8–10). Likewise, their potentials in health promotion (HP) have been extensively reported in the literature (11–13).

In the Americas, available evidence suggests that existing inequalities in health emanate from unequal distributions of power, resources and opportunities (14,15). Despite the prevailing broader imbalance, the greatest allocation of the resources for health in the Americas continues to be solely channelled to health care (16). In the United States for example, the Centers for Disease Control and Prevention (CDC) in 2019 showed that the reasons why preventive services are still low included the role of financial and economic considerations in deciding where resources are to be invested, what will be covered by health benefits and the manner in which clinical services will be billed (17). According to the authors, “With no margin, there is no mission”, indicating the emphasis on financial gains. While several reasons have been reported for poor HP and disease prevention (DP) practices and utilization, by far the most underlying cause is the consequence of an implementation gap rather than information gap (17). Levine and colleagues posit that implementation gap exists as a result of financial incentives that fail to align with health promoting and preventive focus. Policies and strategies in the Americas are traditionally aligned to treatment as opposed to health promotion, and this adversely affects the creation and sustenance of health as well as overall human and societal development. In Brazil, HCWs adopted relevant HP strategies in addressing a plethora of disease conditions that patients present with. However, the extent to which HCWs are involved in this remains uncertain. Previous studies from the United States of America (USA) and Latin America indicates that HCWs do not follow strict guidelines for patients behaviour and lifestyle management (18,19). In a Brazilian study, a high proportion of HCWs comprising medical doctors, nurses and community health workers was found to be engaging in unhealthy lifestyles and subsequently were less likely to encourage their patients to live healthy (20). To improve the quality of health in Canada, the importance of health education as well as the creation of an ideal environment safe for HCWs to practice has been stressed (21).

Following the discussion of HP at the 1984 WHO regional office for Europe, the European region has become the origin of many HP projects, one of which is Health Promoting Hospitals (HPH) (22), where HCWs are afforded the opportunity to implement HP activities to patients. Ziglio and colleagues asserts that the opinions of HCWs must be considered if HP service is to be adequately delivered. In the United

Kingdom (UK), HP services by HCWs are scarce (23). In 2015, the UK health workers were found to demonstrate health behaviours similar to those of the wider population. Sequel upon this, it was concluded that HCWs engaging in unhealthy behaviour may be less credible to be health promoters (24). Dating back to 1984 in the Netherlands, little was known about the medical knowledge of in-patients of Dutch hospitals (25). By 2010, Dutch Government's stimulation of patient education in healthcare facilities by healthcare professionals progressively improved the knowledge, health and wellbeing of patients (26). According to Hoving and colleagues, this role of HCWs has not only significant developmental changes in patient education, but also instituted itself as an integral component of patient's healthcare. In Spain, the need to evaluate HP in terms of both process and results has been emphasised. A Spanish study emphasized the importance of having a good HP practice built and developed within the context of its intended use (27). According to these authors, strategies towards enhancing HP practice should not be dependent on direct translation, rather on robust scientific based evidence.

Evidence from Sub-Saharan Africa shows scanty literature with diverse levels of involvement of HCWs in HP practice. Following the 7th Global Conference on Health Promotion held in Nairobi, Kenya in October 2009, it was observed that it takes closing the implementation gap in HP for there to be visible progress in several aspects such as overall health outcome, poverty and housing, food insecurity, climate change and persistent economic downturns (28). A Rwandan study in 2013 showed that the country's physiotherapists, though encountered certain operational limitations, have good practices in relation to physical activities (29). Similarly, from Nigeria, most physiotherapists demonstrated sound knowledge base necessary for the practice of their profession (30). Data from Nigeria further showed that dieticians play crucial role in the management of diabetes mellitus using dietary guidance (31). In a South African study in 2012, Parker et al., demonstrated that most patients attending the Primary Health Centres are desirous of receiving HP services from HCWs with the view to modifying their lifestyles (32), however, HCWs indicated lack of HP infrastructure, time and staff as part of their limitations to filling this role. By 2020, Kubheka et al. recommended that health professionals should use social media in reaching out to their patients and community in communicating HP related information especially in times of disease breakout and pandemic such as the COVID-19 pandemic (33).

1.2.2 Health Promotion in Hospitals: A Brief Historical Evolution

Countless HCWs widely believe that HP is the responsibility of healthcare workers.

The earliest known hospitals were founded within 6500 BC to AD 650 (34), and were faith based (35). The hospitals were established to serve the needs of the poor class of the society especially – unskilled workers, soldiers, servants, girls with no employment, female workers, wives of workers, artisans or soldiers, and destitute who could not be taken care of by their families (36). The common perception of hospitals in that era was that they did more harm than good to the sick as no evidence suggestive of

therapeutic abilities of HCWs existed. The hospitals essentially served to provide shelter, food, isolation centres for contagious diseases, rather than treatment institutions.

From the end of the 18th century, the negative view on hospitals began to change. This was the beginning of the Renaissance; education was given a positive value, with the advancement of science and medicine (37). From this era, the potential of hospital care to improve the health and wellbeing of patients with innovations as aseptic and antiseptic procedures, better anaesthetic procedures, medical and surgical treatment, and pharmaceuticals became apparent.

Alongside advances in hospital procedures, was the challenge of infectious and chronic diseases, added to threats of epidemics and environmental hazards confronting almost the entire population (38). This led to questions of the role of healthcare in population health. Diverse schools of thought arose challenging healthcare's claim in reduction of infectious diseases, infant mortality and other causes of death (35). Despite existing controversies in his work, the study of McKeown revealed compelling decrease in death, and were believed to be a result of the improvements of nutrition and hygiene (39). Mackenbach in 2005 argued that human diseases are attributable to organisms that are dependent on harsh external environment, suggesting some degree of hard limits to primary prevention, it further assists in devising novel approaches directed at interfering with disease mechanisms (40). On the contrary, Carlson, a lawyer by training has chosen to prosecute medicine, arguing in defense of society that healthcare in its contemporary form should be dissolved (41). Carlson's view came to prominence again in 2000 following the report of the Institute of Medicine that "To err is human". The expert report showed that about 98,000 people in the USA die annually in hospitals because of medical errors (42). A more applicable perspective was tendered by Kruk and others who despite awareness of minimal impact of contemporary healthcare on the population focussed on the approach to improving the system (43–45).

1.2.3 The Health Promoting Hospital Initiative

The focus on HP and DP has led to introduction of HP services within hospitals (46), and subsequently resulted in the initiation about three decades ago, of the International Network of Health Promoting Hospitals (HPH) (47). The HPH initiative, often described as a baby by the Ottawa Charter was established to balance the existing varying perspectives. Beyond provision of comprehensive biomedical care, the HPH ensures development of corporate peculiarity which harmonises HP goals, structural organisation and culture, as well as active involvement of all stake holders including HCWs, patients and the community (46,48,49). The HPH initiative aimed at reorienting hospitals towards placing greater emphasis on HP and DP as against the traditional focus on diagnostics and treatment services (35,48). A prerequisite to acquiring the HPH status involves an institutional self-assessment to identify shortcomings and setting foundation for advancements (50) and willingness to improve inter disciplinary collaboration in the decision making process within the healthcare system (47).

1.2.4 Motivations for Health Promotion in Hospitals in Contemporary World

The literature is replete with motivations for hospitals as key centres for HPs. Recently, hospitals are well positioned centres for practicing several health related matters (51) including HP. The review of Lee et al. showed that hospitals consume greater than half of healthcare budgetary allocation (52). Another study by Kryzanowski et al., 2019 demonstrated that the practice of HP in turn enhances the quality of healthcare of a hospital (53). Constant exposure to HP related information in the hospitals explicitly empowers in-patients to adopt healthy lifestyles (52). Lee et al further highlighted the importance of hospitals as work place for HCWs, healthcare facility, and a community institution that serves as a rallying point for a large group of people (52). In addition, HCWs greatly impact on the population through their services at the hospitals and as well use the same medium as one for HP practices. Again, due to the high value placed on HCWs by the public, their recommendations to patients are often well taken.

Across various healthcare levels, HP and DP are increasingly recognised as integral to the practice of HCWs. Majority of clinical and non-clinical health profession groups have begun incorporating health promotion activities into routine academic curricula, board accreditations, as well as training to influence their clinical practices. While supportive policies for HP exist in some municipalities and provinces, these are not consistent across the board. Health promotion is a worthwhile investment as it not only makes easy a difficult sell but also positions the population on the path to a healthier future. In this sense, research is needed to evaluate the health promotion roles and services offered by health workers in the Nelson Mandela Bay Municipality (NMBM).

1.2.5 Health Promotion and Disease Prevention

Use of the phrase “health promotion and disease prevention” has become commonplace in contemporary healthcare. While health promotion describes ‘any planned measure that promotes health’ (54), disease prevention focus on the avoidance of diseases or their sequelae (55), and not necessarily on the concept of health. Though conceptually treated as separate entities, the difference between HP and DP are seldom seen in practical application.

According to Ali and Katz (56), the field of public health shares the dual objectives of health promotion and disease prevention. Currently, disease prevention has transformed largely from its initial focus on reduction of environmental exposures which individuals and the greater population have minimal control over, to focussing on behavioural and lifestyle changes (57). Interventions directed towards improvement and sustenance of health among the population usually represent a combination of HP and DP strategies. Health promotion to some degree may be considered as being in alignment with the definition of health stretching beyond the absence of disease. Tengland (58) argues that HP may be considered a broader concept that promotes the attainment of wellbeing and happiness while DP is

aimed at avoidance or elimination of disease. It therefore follows that HP need not involve DP, however, DP cannot be achieved without HP (58). As a result, DP is frequently identified as a complementary term to HP and will be treated similarly in this research project.

A primary-health care (PHC) facility offers ambulatory or first-contact personal health care services to patients which focuses on the economic, social and political needs of the population. The PHC includes community clinics, Comprehensive Health Centers (CHC), and Midwife Obstetrics units (MOU). PHC aims at empowering individuals, families, and communities to adapt strategies that will promote their health as early as possible.

Although the focus of this study is not on the training curricular of PCP, a twenty-year HP-training experience at a faculty of medicine in Geneva showed that the training HP comprised of a political component, community immersion component, and development of personal skills(59). Mattig et al (2017)(59) further showed that with respect to reorienting health services, students were encouraged to follow a HP -specific track for advanced studies. Records regarding HP training for would be physicians were scarce in the sub-Saharan Africa. This study further explored the roles primary care physicians in health promotion using the systematic review approach as presented below.

The Roles of Primary Care Physicians in Health Promotion and Disease Prevention: A Systematic Review

Herbert I Melariri, Wilma ten Ham-Baloyi, Moses J Chimbari, 2022. The Roles of Primary Care Physicians in Health Promotion and Disease Prevention: A Systematic Review (Under second round review with Preventive Medicine Reports)

**The Roles of Primary Care Physicians in Health Promotion and Disease Prevention: A
Systematic Review**

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Abstract

Health promotion (HP) and disease prevention (DP) are essential for sustainability of achieved health gains for individuals and communities. The primary care physician (PCP) is the physician of first consult of the sick and hence is well positioned to implement HP and DP strategic interventions. We conducted a systematic review to determine the roles of PCPs in implementing HP and DP. We searched for literature in EBSCOhost (CINAHL, Health Source - Nursing/Academic Edition, MEDLINE) and Pubmed for the period 2011 to 2021. We also conducted manual search based on citations of articles identified through searches in the electronic databases. The main inclusion criteria were studies published in English reporting on the practice of PCPs in relation to HP and/or DP. The study designs of the included records were mostly cross-sectional (using quantitative and/or qualitative methods) and randomized control trials. Assessment of study quality was conducted using the Appraisal tool for Cross-Sectional Studies (AXIS) for quantitative, qualitative, and mixed methods' studies as well as the Critical Appraisal Skills Programme (CASP) for randomized controlled trials. The assessment was followed by thematic analysis of the extracted data. The search strategy identified 1861 articles of which thirty-three were included in the review. Six themes related to roles of PCPs in implementing HP and DP. Consistent with current studies on HP and DP, PCPs are aware of their expected roles and carry out the minimum required interventions to promote HP and DP. They were mostly involved in counselling and prescriptions for physical activities, smoking cessation, lifestyle modifications, as well as maternal and child health promotion. Lack of time resulting from increased patient load, overburdened with administrative roles, poor staffing, inadequate referral services, and poor health status of PCPs were identified as barriers towards their roles in HP and DP and should be targeted for improvement. This review has identified the current roles of PCPs in implementing HP and DP, and the associated barriers. Addressing the barriers require changes at individual, functional and structural levels of health care delivery.

Keywords: Health Promotion, Disease prevention, Primary care physician, roles

Introduction

Health promotion (HP) and disease prevention (DP) are a recurrent theme in global and public health discussions as they both strive towards a healthy population. Although important for achieving the universal health coverage, the success of HP and DP practices are not immediately visible as are curative interventions (Fineberg, 2013).

Primary health care (PHC) was established by the World Health Organization (WHO) at the Alma-Ata declaration in 1978 (World Health Organization (WHO), 1978) to address global widespread inequality and aimed to work towards attainment of good health for all. To further strengthen this goal, the Universal Health Coverage (UHC) was set up to ensure that individuals and communities access healthcare with ease using HP and DP as key elements (World Health Organization (WHO), 2021). At the Global Conference on Primary Health Care in 2018 (Astania declaration), PHC was identified as the cornerstone of UHC (World Health Organization (WHO), 2018). Since its creation, the PHC has become a recognized HP and DP leader due to its influence, set mission, and population coverage. As in other levels of healthcare delivery, physicians at the PHC are key drivers in the achievement of health goals but their roles in HP and DP have varied over time.

Without specificity to any healthcare profession, the WHO's scope of function for HP include actions directed at strengthening the skills and capabilities of individuals, changing social, environmental, and economic determinants of health in order to optimise health. Similarly, disease prevention roles comprise of measures directed at lowering the prevalence of risk factors common to a range of diseases (Primary prevention); measures directed towards early detection of existing disease with a view to arresting or delaying the progression of the disease and its effects (Secondary prevention); and disease management strategies and/or rehabilitation intended to avoid or reduce the risk of deterioration or complications from established disease(Tertiary prevention) (World Health Organization [WHO], 2021).

Evidence from 1981 to 1990 revealed none to low willingness of primary care physicians (PCPs) to consider playing a role in implementing HP and DP. For example, a lack of consensus amongst PCPs' regarding their recommended roles in HP and the perception that PCPs cannot change patients' behaviour have been reported (Wechsler *et al.*, 1983; Rosen, Logsdon and Demak, 1984; Orleans *et al.*, 1985). The PCPs were not optimistic of patients heeding their recommendations towards lifestyle and wellbeing and thus questioned their role in this field. Primary care physicians were not only reluctant to attend to lifestyle related problems, but also admitted their ineffectiveness in implementing HP strategies (Orleans *et al.*, 1985). Some studies have reported small improvement on the responses of physicians to HP and DP roles and services. For example, it has been shown that only less than 20% of physicians recorded successes in influencing their patients to achieve positive behavioural change (Valente *et al.*, 1986).

There appeared to be progressive improvement on the motivation and participation of PCPs in HP and DP in the period 1991-2000. The study of Schwartz *et al.* (1991) showed that younger physicians demonstrated HP and DP practice in accordance with the recommended practice guidelines. Wechsler *et al.* (1996) revisited the theme "The Physician's Role in Health Promotion". Their study showed that 89% of physicians indicated that the responsibility of educating patients about health-related risk factors was definitely theirs. Though fewer physicians in 1996 (Wechsler *et al.*, 1996) compared to 1983 (Wechsler *et al.*, 1983) deemed it necessary to encourage patients to discuss personal problems in order to provide them with requisite emotional support and counselling, majority of the physicians still saw working with patients to improve their risk factors and adhere to healthy regimen as their responsibility.

Available records between 2001 and 2010 revealed alternating views among PCPs. While physicians accede to HP and DP being their responsibility, they were less likely to be involved in this practice (Brotons *et al.*, 2005). More than half of physicians considered their roles in HP and DP as not only difficult, but also time consuming and unrewarding (Brotons *et al.*, 2005). Other evidences showed that physicians' personal lifestyles were critical in determining their involvement in supporting patients towards healthy living and disease prevention (Oberg and Frank, 2009) lifestyle. Physicians' personal lifestyles proved to be one of the strongest predictors of HP and DP practices – as most physicians who

engaged in healthy lifestyles readily counselled their patients to do the same, while those that did not practice a healthy lifestyle found it difficult to encourage their patients to do that. The health and wellbeing of physicians are vital as they should serve as role models for promoting healthy behaviour change (Oberg and Frank, 2009).

Synthesis of evidence on the roles of PCPs in HP and DP, and associated challenges will avail healthcare professionals, investigators, and policy makers with a broad picture regarding contemporary opportunities and challenges encountered by PCPs in the design and implementation of feasible HP and DP strategy. We therefore sought to synthesize available studies on the roles of PCPs in implementing HP and DP in the period 2011-2021.

Method

Sources and Search strategy

The main review question that guided the search strategy was: *What are the roles of primary care physicians in health promotion and disease prevention?* A literature search was conducted by the first author in EBSCOhost (CINAHL, Health Source- Nursing/Academic Edition, MEDLINE), and Pubmed. Strategies such as limiters were created to maximize sensitivity and employed in searching the relevant information using the following search words - (health promotion) AND (medical doctor* or physician*) AND (disease prevention or health promotion or health education) AND (primary health care or primary care) AND (disease prevention) AND (child health promotion). A manual search using citations of articles identified through searches in the electronic databases was also conducted to complement studies retrieved from the database search.

Inclusion Criteria and Study Selection

Eligible studies were those written in English language, published between January 2011 and May 2021 and peer reviewed. We included studies that examined PCP's HP and/or DP practices, conducted in PHC settings, in any country, and involving population of all ages. Studies involving physicians at the secondary and tertiary healthcare settings were excluded. Papers whose focus were devoid of sufficient relevance to the aim were also excluded.

Database and manual search returned 1861 records of which 893 were duplicates. The first and second authors independently screened the remaining 965 records by article titles and abstracts. A total of 860 studies were excluded, leaving 108 studies to be obtained for full text screening. After all authors screened the full-text studies for eligibility based on the inclusion and exclusion criteria, 50 articles were excluded with reasons: not focussed on physicians and / or preventable disease, expert, and scientific reports. Fifty-eight articles were included in the critical appraisal (see Figure 1).

Critical appraisal

Assessment of 58 studies for study quality was conducted using the Appraisal tool for Cross-Sectional Studies (AXIS) for the quantitative, qualitative, and mixed methods' studies (Downes *et al.*, 2016) and Critical Appraisal Skills Programme (CASP) for the randomized controlled trials. The critical appraisal was conducted by the first author and second author independently. The appraisal assessed the clarity of aims and alignment to the designs. The appropriateness of the statistical methods, risk factors, and outcome variables were assessed. Regarding the included randomized controlled trials (RCT), the allocation sequence was assessed to ensure that both researchers and participants were blinded; furthermore, assignment of participants was checked for sufficiency in randomisation to exclude systematic bias. Based on these criteria, a total of 25 studies were excluded based on low quality design, poor statistical methods (see Figure 1).

Data extraction and Synthesis

After critical appraisal, 33 studies were included for data extraction and synthesis. The first author reviewed the eligible articles and extracted data with the aid of standardized forms adapted from a previous study (Rubio-Valera *et al.*, 2014). The second author checked all the information extracted from the studies included. Extracted information included details of the country where the study was conducted, year of field work, participants, methods of data collection, and study aims.

Due to the heterogeneity of the extracted data, thematic analysis was conducted. Six themes, adopted from the WHO's scope of function of HP and DP (WHO EMRO, 2020) and adapted to suit the PCPs' role were created (see Figure 2). Authors grouped the measures of HP and DP interventions into one of

the six predetermined themes already described. Studies that reported on same study population but having unique analyses were assessed independently while those with same study population and same analysis were considered a single study.

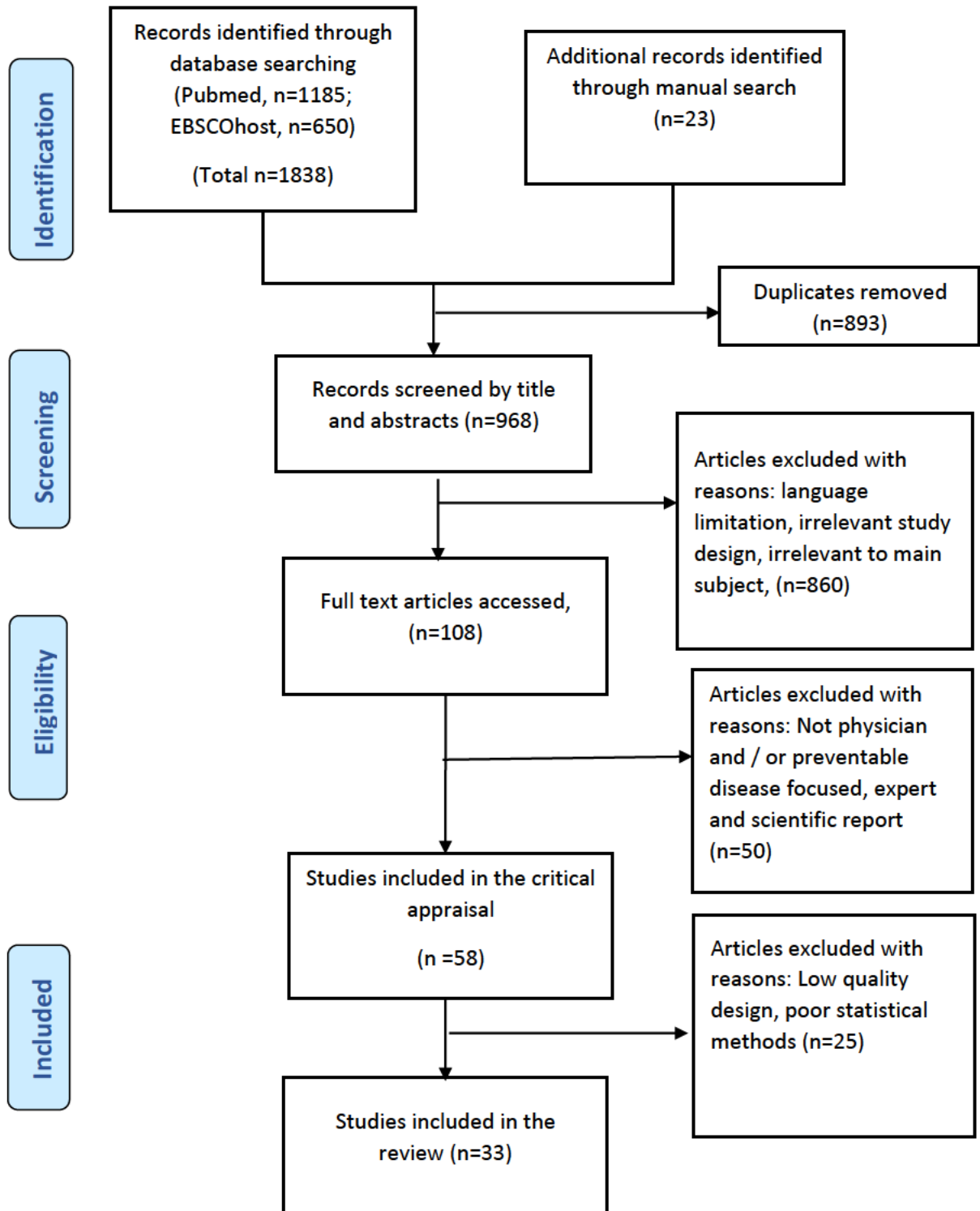


Figure 1. PRISMA flow-chart of systematic review (Moher *et al.*, 2009)

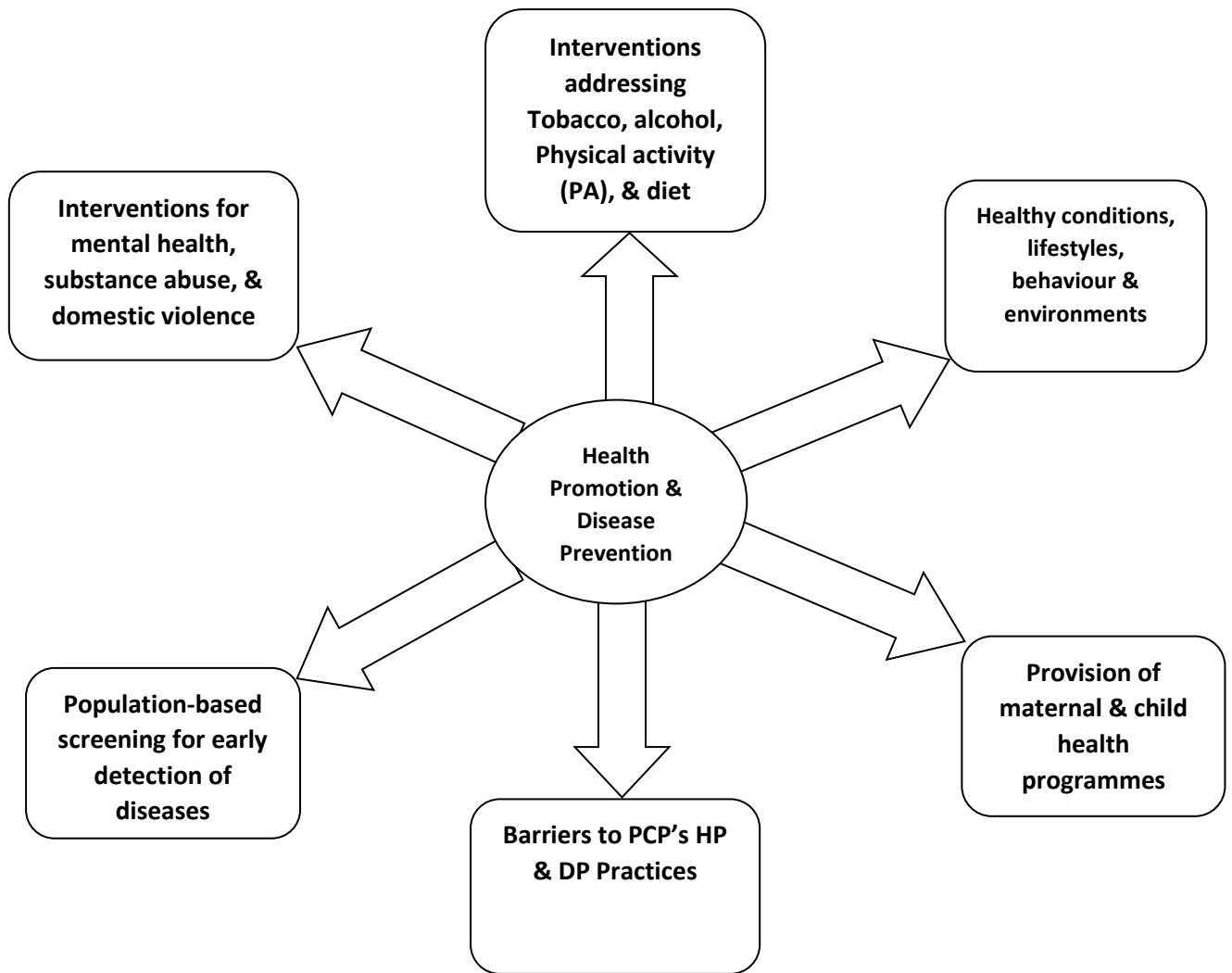


Figure 2: Thematic representation of HP and DP strategies by the primary care physician (adapted from (WHO EMRO, 2020))

Results

Thirty-three studies were included in the synthesis (Figure 1). The study designs of the included records were mostly cross-sectional (using quantitative and/or qualitative methods) (72.73%, n=24), and randomized control trials (27.27%, n=9). Majority of the included studies were conducted in North America (USA, n=13, Canada, n=2), followed by, Europe (n=9) (Germany, n=3; Spain, n=2; Poland and Lithuania, n=2; Netherland, n=1; Turkey, n=1), Asia (n=7) (China, n=2; India, n=1; Vietnam, n=1; Saudi Arabia, n=1; Israel, n=1; Lebanon, n=1), and South America (Brazil, n=2). The majority (n=18) of the studies focused on lifestyle changes, physical activities, dietary counselling, smoking cessation, and diabetic control. Seven of the studies focused on cancer screening and prevention. The remaining studies focused on blood pressure monitoring, medication adherence (n=1); weight management (n=2); and implementation of evidence-based programmes for disease management and prevention (n=2). Three studies centered on children's health outcome (Table 1).

Table 1: Characteristics of included studies (n=33)

Study	Field work year(s)	Country	Participants	Methods of data collection	Aims (using original wordings of study)	Health Promotion and/or Disease Prevention-related services performed by PCPs	Key outcomes
Tomasik <i>et al.</i> , (2011)	2009	Poland and Lithuania	19 physicians	Focus groups	Exploring the views of PCPs concerning: (1) the most important FP/GPs competences in HP&DP needed in their daily practice; (2) areas where competences acquired during vocational training may be below the desired level.	HP and DP competences of PCPs	PCPs view preventive care as one of their main roles.
Jibara <i>et al.</i> , (2011)	2008-2009	USA	400 men and Women aged 50 or older	Face-to-face interviews	To identify the characteristics of Hispanic patients who adhere or do not adhere to their physician's recommendation to have a screening colonoscopy.	Screening colonoscopy recommendation	A quarter of participants did not adhere to their physician's recommendation for screening colonoscopy.
Henderson <i>et al.</i> , (2011)	2009	USA	28 primary care physicians	focus group discussions.	To better understand the factors influencing physicians' decisions about screening patients for lung cancer.	PCPs recommendation for lung cancer screening using computerized tomograph scan	PCP's perception of a screening effectiveness influenced their decision to proceed with it.
Cooper <i>et al.</i> , (2011)	2002-2005	USA	41 PCPs and 279 patients	Randomized controlled trial	To compare the effectiveness of patient and physician interventions, separately, and in combination with one another, with the effectiveness of minimal interventions, by evaluating intervention impact on: 1) patient-physician communication behaviors; 2) patient ratings of the interpersonal process of care; 3) patient adherence to medications; and 4) blood pressure (BP) levels and control over 12 months.	PCP -patient communicate-on	Visits of trained versus control group PCP revealed more positive communication change scores from baseline.
Grover <i>et al.</i> , (2011)	2006-2007	Canada	2674 patients	Survey	To identify the therapeutic shortcomings currently observed among Canadians treated for dyslipidemia or hypertension and to estimate the impact of bridging these gaps, given the available options.	Treatment of dyslipidemia or hypertension	Better treatment of cardiovascular risk factors could result in a substantial reduction in morbidity and mortality among Canadians
Martin and Badalyan (2012)	Not stated	USA	582 physicians	Survey	The purpose of this study was to identify vaccination patterns of both general pediatricians and subspecialists with regards to their own children and projected progeny	Child vaccination	Until 2009, general pediatricians and pediatric specialists have largely adhered to Advisory Committee on Immunization Practices (ACIP) recommendations, but due to vaccine safety and other concerns, both groups, albeit a

							higher percentage of specialists, reported greater numbers willing to diverge from these recommendations
Vermunt <i>et al.</i> , (2012)	2008	Netherlands	48 General Practitioners and 479 individuals in the IG 446 individuals in the CG	Randomized controlled trial	We evaluate the results over 2.5 years on the effectiveness of the APHRODITE intervention compared to usual care. In addition, we investigate the influence of motivational and self-efficacy variables of both participants and professionals on weight loss success.	Lifestyle counselling	Risk factors for diabetes could reduce significantly by lifestyle counselling.
Bock, Diehm and Schneider, (2012)	2009	Germany	260 physicians	Questionnaire	The practice of PA promotion in German primary care settings and the factors associated with PA promotion.	Provision of PA	About a quarter of PCPs reported inadequate knowledge to provide counselling and some felt they were unsuccessful in motivating their patients to increase PA.
Shai <i>et al.</i> ,(2012)	2010	Israel	77 HCPs and 496 patients	Randomized controlled trial	To determine the effect of self-experience multidisciplinary lifestyle intervention on health care providers patients and clinics	Physicians' personal style and HP practice	Physicians' personal lifestyles are directly correlated with their clinical performance in terms of HP.
Richards <i>et al.</i> , (2012)	2007-2008	USA	647 PCPs	Questionnaire	To accurately describe PCP practice patterns, knowledge, and beliefs in the area of prostate cancer screening.	HP knowledge and practice	Higher proportion of African American (AA) than non-AA PCPs recorded higher PSA testing during health maintenance exams.
Rim <i>et al.</i> ,(2014)	2007-2008	USA	1280 PCPs	Survey	To identify PCP practice patterns regarding prostate-specific antigen (PSA) testing in asymptomatic men and those at higher risk because of race or family history.	PCPs prostate cancer screening using prostate surface antigen test	Most PCPs discuss the potential benefits/risks of PSA testing with patients prior to its recommendation.
Göriga <i>et al.</i> , (2014)	2011-2012	Germany	4074 PCPs	Questionnaire	To explore the routine provision of dietary advice and factors associated with dietary counselling to prevent cardiovascular disease (CVD).	Dietary advice	High levels of involvement by PCPs in CVD prevention and dietary counselling.
Goldstein <i>et al.</i> , (2014)	2012	USA	1485 PCP	Web-based survey	To determine the frequency of physicians reporting supportive, health-promoting environments in their facility and identify characteristics of physicians and medical	HP practice	Less than 50% PCPs work in facilities with wellness supportive environments, suggesting

					practices associated with support.		many missed chances to promote wellness.
Hammig and Jozkowski,(2015)	2007-2010	USA	27.3 million patients	National Ambulatory Medical Care Survey	To examine the prevalence and related factors associated with health education counseling by primary care physicians who treated pediatric patients presenting with unintentional injuries.	Health education by PCPs	Injury prevention counseling was low among PCPs
Diehl <i>et al.</i> , (2015)	2011-2012	Germany	4074 PCPs	Questionnaire	To identify potential gender differences in the implementation of health promotion and the prevention of CVD in primary care.	Provision of prevention measures and assessment of attitude towards counselling	Both female and male PCPs had a positive attitude towards lifestyle counselling.
Ross <i>et al.</i> ,(2015)	2011-2012	Canada	96	Semi-structured interview	To identify the mechanisms underlying poor primary care access for this population.	Barriers to healthcare access	Socioeconomic and psychological barriers contribute to difficulty in patients accessing primary health care and prioritizing their own health.
Feng <i>et al.</i> ,(2015)	Not stated	China	2160 high risk individuals	Randomized controlled trial	To demonstrate that high risk individuals in the intervention arm will, compared to those in the delayed intervention condition, show increased use of cancer screening service.	Cancer screening	Detailed risk assessment by village doctors covers only a third of patients and personalized cancer screening promotion, 6 %.
Garg <i>et al.</i> , (2015)	2011-2012	USA	336 caregivers	Randomized controlled trial	To evaluate the effect of a clinic-based screening and referral system (Well Child Care, Evaluation, Community Resources, Advocacy, Referral, Education [WE CARE]) on families' receipt of community-based resources for unmet basic needs	Completion of clinical screening tool to identify 6 basic needs (childcare, food security, household heat, housing, parent education, and employment) in clinic waiting rooms prior to their children's well visits	The primary study outcome was enrollment in new community-based resources at the time of the child's 12-month well visit.
Hidalgo <i>et al.</i> ,(2016)	2011	Brazil	798 health professionals.	Questionnaire	To determine the health promotion practices and personal lifestyle behaviors of health professionals (physicians, nurses, and Community Health Workers) working at primary care units	HP Knowledge and practice	High numbers of PCPs do not engage in healthy lifestyle behaviors that impact chronic diseases, thus are less likely to motivate for such behaviors in their patients.
Pati <i>et al.</i> , (2017)	2013	India	30 physicians	Self-administered questionnaire	To survey the current status of health promotion knowledge, perceptions and practices of local primary care physicians, with an intention to locate and improve such practice.	HP knowledge and practices	There exists a significant difference between the mean of current and ideal health promotion practices.
Wu <i>et al.</i> ,(2017)	2015	China	181 individuals to IG, and 188	Randomized controlled trial	The effectiveness of brief physician advice together with four very brief	Smoking cessation	A short-lived, affordable intervention on

			individuals to CG		telephone calls in promoting smoking cessation among Chinese men via reduction compared with equivalent advice on diet and exercise.		smoking cessation facilitates smoking abstinence.
Leppin <i>et al.</i> , (2018)	2015	USA	205 clinicians & 103 non-clinicians	Interview and survey	To understand, categorize, and richly describe key challenges and opportunities related to integrating EBPs into routine primary care practice in the United States, using the CDSMP as a test case.	Chronic Disease Self-Management Program (CDSMP)	Primary care and community-based programs exist in disconnected worlds.
Alvarez <i>et al.</i> ,(2018)	Not stated	USA	448 patients	Questionnaire	To measure the association between health literacy and both patient-reported and clinical outcomes in patients with non-insulin-treated type 2 diabetes.	Health literacy	Limited health literacy was associated with poorer glycemic control and an increased frequency of SMBG testing in patients with non-insulin-treated type 2 diabetes.
Walker <i>et al.</i> ,(2018)	2015-2016	USA	18 family medicine and internal medicine physicians	Focus group discussions	To describe weight related attitudes, perceptions, and beliefs of physicians regarding weight management in women.	HP attitudes and practice	PCPs perceptions of their lack of education or training and inability to influence patient behaviors influence discussion of weight control with patients.
Yaman and Atay, (2018)	Not stated	Turkey	16 PCPs	Randomized controlled trial	To examine the effect of exercise prescribed by PCPs on the quality of life (QoL) of elderly people.	Exercise prescription	PCPs recommendation of exercise improved the quality of life of the elderly.
Novais <i>et al.</i> ,(2019)	2008-2013	Brazil	364	Randomized controlled trial	To compare the effectiveness of (1) standardized counseling on PA performed by the physician, (2) individualized counseling with referral to places georeferenced for exercising near the homes of the older population, and (3) a minimal brief counseling intervention on the increase of leisure-time PA (LTPA) in the short and long term in an urban cohort of older adults.	PA	Findings reveal that interventions with PA programs group are effective in producing sustained changes in PA among the elderly.
Ivanova <i>et al.</i> ,(2019)	2015-2018	USA	81 children	Randomized controlled trial	To test the feasibility of the VFBA in a community primary care pediatric clinic. As a secondary goal, the RCT aimed to test the efficacy of the VFBA to improve healthcare engagement and health outcomes for children and parents.	Family wellness training	The Vermont Family Based Approach was associated with a significant increase in engagement with health and wellness supports and services for families.

Alahmed and Lobelo, (2019)	2016	Saudi Arabia	147 physicians	Questionnaire	To explore the association between knowledge, attitudes, and practices among PHC center physicians and their provision of PA counseling. The study also evaluated the effect of the physicians' lifestyles, personal health status, and other demographic characteristics on the provision of PA counseling.	PA counseling.	Most PCPs believed that PA promotion to patients was their responsibility, and were confident in their ability to provide this service.
Znyk <i>et al.</i> ,(2019)	2017	Poland	200 General Practitioners (GPs)	Questionnaire	To assess whether GPs in Piotrkowski district monitor and evaluate health behaviors of their patients in the field of a diet, PA and weight control, and whether they provide appropriate counselling with this regard.	Health promotion practice	The likelihood of assessing lifestyle characteristics of patients was higher for PCPs who believed that they were obliged to do so.
Hoa <i>et al.</i> , (2020)	2017-2019	Vietnam	150+22 =172 PCPs	PCAT Questionnaire in-depth interviews	To explore how primary care physicians working at CHCs in Vietnam evaluate their own performance and what they perceive can be done to improve primary care and strengthen their role as the primary entry point to the health care system.	Interviews	PCPs rated the quality of ongoing service and first contact in PHCs as the best.
Martin-Cantera <i>et al.</i> ,(2020)	2016-2017	Spain	1514 PCPs and nurses	Questionnaire	To analyze the activities carried out by PC physicians and nurses in Spain with respect to smoking cessation management.	Smoking cessation	Good practice of PCPs regarding smoking cessation is related to being non-smokers or ex-smokers and having adequate training and knowledge.
Esteban-Vasallo <i>et al.</i> ,(2020)	2012	Spain	3586 PCPs and nurses	Questionnaire	To describe the professionals' opinions and attitudes towards cancer prevention and their specific training; and to describe the frequency of individual, group, and community interventions and to analyse the factors associated with their typical use.	Attitudes, training, and interventions relating to cancer prevention	Family physicians seldom practice group and community lifestyle interventions. This may be attributed to lack of confidence in their effectiveness, lack of training, and their own attitudes towards prevention
Bou Akl <i>et al.</i> ,(2021)	2018-2019	Lebanon	150 PCPs and 100 pulmonary specialists.	Questionnaire	To evaluate the knowledge and practice of meeting the international guidelines for lung cancer screening among Lebanese PCPs and pulmonary specialists.	HP knowledge and practice	Only few PCPs recognized the population at risk for which screening is recommended for lung cancer.

Themes

A total of six themes (Figure 2) were identified, which are discussed below.

Healthy conditions, lifestyles, behaviour, and environments

Primary physicians' activities directed at HP and DP interventions in this category were analysed in 24 studies (Henderson *et al.*, 2011; Tomasik *et al.*, 2011; Cooper *et al.*, 2011; Grover *et al.*, 2011; Shai *et al.*, 2012; Vermunt *et al.*, 2012; Goldstein *et al.*, 2014; Göriga *et al.*, 2014; Martin *et al.*, 2015; Diehl *et al.*, 2015; Feng *et al.*, 2015; Hammig and Jozkowski, 2015; Hidalgo *et al.*, 2016; Pati *et al.*, 2017; Alvarez *et al.*, 2018; Leppin *et al.*, 2018; Walker *et al.*, 2018; Yaman and Atay, 2018; Alahmed and Lobelo, 2019; Novais *et al.*, 2019; Znyk *et al.*, 2019; Hoa *et al.*, 2020; Martin-Cantera *et al.*, 2020; Esteban-Vasallo *et al.*, 2020). One study demonstrated the relevance of PCP's participation in enhancing patient's health literacy. Despite physicians' recommendations of self-monitoring of blood glucose and frequency of testing, patients with low health literacy had poor glycaemic control compared to their more literate counterparts (Alvarez *et al.*, 2018). A total of 50% (n=12) of these studies focussed on the impact of broader lifestyle and HP educational and counselling activities by PCPs. In one study assessing the impact of prescribing exercise to the elderly, the intervention group (IG) were advised to participate in endurance and physical fitness training. The results showed that the IG emerged more physically and mentally fit when compared to the control group (CG) (Yaman and Atay, 2018). Further supportive roles by PCPs towards HP and DP through education and counselling on lifestyle modification were reported in other studies - dietary counselling for cardiovascular disease (Göriga *et al.*, 2014) and predictors of lifestyle related counselling by general practitioners (Znyk *et al.*, 2019). The PCP is tasked, not only with the responsibility of treating diseases, but primarily to address the health needs of the patient and develop their health potential. To achieve this, an ideal health facility environment designed to support patients' need is required. Only one study reported on physicians' assessment of health facility environment in relation to health and wellbeing. Although physicians' reporting of individual health facility environments supportive for PA, nutrition and lactation were above average (60%, 70%, and 76% respectively), a combined rating of all three in one facility fell below average (40.4%) in promoting health (Goldstein *et al.*, 2014).

Population-based screening programmes for early detection of diseases

Interventions towards screening to ensure prompt diagnosis of diseases, and provision of medications to ensure control of risk factors were analysed in nine studies (27.27%) (Henderson *et al.*, 2011; Jibara *et al.*, 2011; Tomasik *et al.*, 2011; Richards *et al.*, 2012; Shai *et al.*, 2012; Rim *et al.*, 2014; Feng *et al.*, 2015; Esteban-Vasallo *et al.*, 2020; Bou Akl *et al.*, 2021) . The most frequently examined factor by physicians was screening for cancers with high global morbidities and mortalities such as lung, colorectal, prostate, and breast cancers. For example, Henderson *et al.*, (2011) sought to understand the factors that influenced physician's decision to screen patients for lung cancer. Their study showed that PCPs' decision about screening patients for lung cancer was influenced by among other things, their perception of the screening effectiveness, their practice experience, patient's risk for lung cancer, reimbursement for services, and litigation related concerns. Rim *et al.*, (2014) showed that majority of PCPs preferred to discuss with their patients' risks and benefits of screening for prostate cancer (Rim *et al.*, 2014). Similarly, Esteban-Vasallo *et al.*, (2020) explored PCPs' opinions, attitude, and practices regarding cancer prevention. The study revealed that though prevention offered the most cost-effective long-term strategy for cancer control, PCPs rarely practiced group and community interventions. In another study comparing African-American with non-African American PCPs' prostate cancer screening, Richard's *et al.*, (2012) found that most African-American PCPs compared to their non-African American counterparts recorded above the median prostate cancer screening for their patients (Richards *et al.*, 2012)

Interventions addressing tobacco, alcohol, physical activity, and diet (Including nutritional and food supplementation)

Seven studies (Bock, Diehm and Schneider, 2012; Göriga *et al.*, 2014; Martin *et al.*, 2015; Wu *et al.*, 2017; Alahmed and Lobelo, 2019; Novais *et al.*, 2019; Martin-Cantera *et al.*, 2020) examined PCP's interventions directed at tobacco, PA, and diet. Of this number, four focussed their activities on PA, two on smoking cessation, one on diet and found mixed results. For example, Novais *et al.*, (2019)

demonstrated that PCPs interventions with PA programs are effective in producing sustained changes in PA among the elderly. In another study, Alahmed and Lobelo (2019) showed that female doctors were more prone to support PA than their male counterparts. These authors further showed that physicians suffering from no chronic diseases more often made written PA prescription to their patients than those with chronic diseases did. Martin-Cantera *et al.*, (2020) showed that the good practice of PCPs concerning smoking cessation is related to the PCP being a non-smoker, ex-smoker, and adequately knowledgeable (Martin-Cantera *et al.*, 2020). Regarding diet, female physicians were more prone to adopt all five counselling techniques - Assess, Advise, Agree, Assist, and Arrange (5 As) as compared to male physicians (Göriga *et al.*, 2014). However, during counselling, especially in diet related cases, PCPs were found to use mostly the ‘assess’ and ‘advise’ as against the entire components of the 5As (Göriga *et al.*, 2014).

Provision of maternal and child health programmes (including screening and prevention of congenital malformations)

Services relating to maternal and child health were examined in six studies (Tomasik *et al.*, 2011; Martin and Badalyan, 2012; Goldstein *et al.*, 2014; Garg *et al.*, 2015; Hammig and Jozkowski, 2015; Alahmed and Lobelo, 2019). Depending on the specific measure of scope, the intensity, and outcome measure explored, the authors found different results.

Regarding childcare, PCPs in one study reviewed a survey completed by mothers /caregivers in the areas of childcare, food security, household heat, housing, parent education, and employment. All mothers on enrolment received screening. Thereafter, eligible mothers received the screening at their child’s subsequent well visit (Garg *et al.*, 2015). The study showed that PCP’s screening and referring for unmet basic needs during the delivery of well childcare leads to greater receipt of community resources for poor families. In another study (Alahmed and Lobelo, 2019), reported extensively on the role of physicians in promoting maternal and child physical activities. According to Alahmed and Lobelo (2019), many primary care physicians attended to a maximum of ten paediatric patients on daily

basis. These authors showed that PCPs that graduated from home (indigenous) universities and those attending to fewer adults were more inclined to paying greater attention and promoting paediatrics' physical activities. Physicians who demonstrated good to excellent levels of knowledge relating to PA guidelines and recommendations were likely to promote PA for both children and pregnant mothers (Alahmed and Lobelo, 2019). Although female physicians compared to their male counterparts were more likely to evaluate PA in children, there was no statistically significant difference in this finding (Alahmed and Lobelo, 2019). Hammig and Jozkowski (2015) reported prevention counselling to children presenting with unintentional injuries to be low among physicians. The study further showed a gender difference with injury counselling to be 2.4 times more likely in favour of boys.

Among the physicians, educational competencies were reported in relation to child and maternal health (Tomasik *et al.*, 2011). Tomisak and colleagues showed that PCPs competence rested on their continuous provision of antenatal, perinatal, early, and late childhood care. Other components of PCPs' roles in HP and DP included family planning services, individual and group educational activities in collaboration with practice team, screening services and treatment. Preventive interventions undertaken by PCPs have also been reported (Tomasik *et al.*, 2011). The study of Tomisak *et al* also highlighted on the importance of preventive measures such as vaccination among children. Accordingly, these roles comprise identification of individuals and groups with high risks for communicable and NCDs, provision of short-term interventions for addicts, maintenance of consistency in immunization coverage, and lifestyle/health behavioural change counselling (Tomasik *et al.*, 2011). While vaccination related information can be sought from diverse sources by parents, physicians are the most relied resource. The study of Martin and Badalyan (2012) showed that while most physicians complied with the ACIP recommended child vaccination schedule upto 2009, some physicians reported their determination not to follow this recommendations going forward citing concerns on vaccine safety as reason.

Interventions addressing mental health, substance abuse, & domestic violence

Two studies examined at least one component of mental health and domestic violence (Hammig and Jozkowski, 2015; Ross *et al.*, 2015). The authors considered different components of the themes and reported consistent trends. According to Ross *et al.*, (2015), several PCPs considered mental health and substance abuse as one outside of their scope while linking it with their perceived suboptimal knowledge in the field (Ross *et al.*, 2015). Ross *et al.* also showed that clients were strongly affected by the PCP's value and attitude. For example, some PCPs may cause patients to be embarrassed as they address it as 'drug seeking'. Regarding domestic violence, Hammig and Jozkowski (2015) reported that counselling towards injury prevention by PCPs was low.

Barriers to Primary Care Physician's Health Promotion and Disease Prevention practices

Barriers to HP and DP practices by PCPs was supported by seven studies (Göriga *et al.*, 2014; Diehl *et al.*, 2015; Pati *et al.*, 2017; Leppin *et al.*, 2018; Walker *et al.*, 2018; Znyk *et al.*, 2019; Hoa *et al.*, 2020). Primary care physicians considered lack of adequate knowledge and /or evidence based training (Diehl *et al.*, 2015; Pati *et al.*, 2017; Leppin *et al.*, 2018; Hoa *et al.*, 2020) in HP and DP, lack of time resulting from increased patient load, overburden with administrative roles, poor staffing, inadequate referral services, and poor health status of PCPs (Pati *et al.*, 2017; Znyk *et al.*, 2019; Hoa *et al.*, 2020) as barriers towards their role in HP and DP. According to the physicians, patient' ignorance of accruing benefits from HP and DP, unwillingness to change their lifestyle, cultural differences, insufficient interconnection with other health providers, excess guidelines and insufficient evidence (Diehl *et al.*, 2015) adversely affected some PCPs. Lack of financial support and budget, and insufficient reimbursement for services were further reported as impeding factors (Göriga *et al.*, 2014; Znyk *et al.*, 2019). Wrong perceptions of patients by physicians (Walker *et al.*, 2018) and the perception that HP and DP is not their job (Leppin *et al.*, 2018) were also identified barriers towards HP and DP practices among PCPs.

Discussion

The aim of this systematic review was to synthesize literature on the role of PCPs in HP and DP. Although the literature review showed that the current practice of PCPs with respect to HP and DP represented only a small fraction of their professional practices, most physicians were aware of the importance of HP and DP in healthcare and the need for these to be incorporated into their practices. Furthermore, when compared to the WHO's scope of function (World Health Organization [WHO], 2021), this review shows that the PCPs focused mostly on the aspect of HP directed at strengthening the skills and capabilities of individuals and patients, as well as DP in general. This calls for enhanced interprofessional collaboration as some of the complimentary functions of HP falls outside of the scope of the PCPs.

Among the included studies, 23 records (69.69%) addressed healthy conditions, lifestyles, behaviour, and environments; nine (27.27%) studies dealt with population-based screening programmes for early detection of diseases, and seven (21.21%) studies examined interventions addressing tobacco, alcohol, PA, and diet (Including nutritional and food supplementation). Furthermore, provision of maternal and child health programmes, including screening and prevention of congenital malformations was explored by four (12.12%) studies; Health services interventions to address mental health and substance abuse; and domestic violence by two (6.06%) studies and barriers to PCP's HP and DP practice by seven (21.27%) studies.

The importance of PA in the support of patients and well-being of the population has been well reported in contemporary literature (Brickwood *et al.*, 2021; Chi *et al.*, 2021; Faulkner *et al.*, 2021; Hall *et al.*, 2021). These benefits were also perceived in the reviewed studies. In fact, almost 60% of PCPs believed that the promotion of PA among patients was their responsibility and 53 % of the PCPs admitted having the requisite knowledge to carry out this role.(Alahmed and Lobelo, 2019). Additionally, the results show that PCPs' based counselling of patients resulted in significant increase in leisure-time PA of patients (Novais *et al.*, 2019). It is noteworthy that a risk factor identified in the current review is similar to that observed in a Cochrane Database of Systematic Reviews by Stead *et al.*, (2013). According to Stead and colleagues, PCPs' brief advice compared to non-advice resulted in a significant increase in

the rate of smoking cessation (relative risk 1.66) (Stead *et al.*, 2013). However, in contrast to the Cochrane review, no study in the current review examined the effect of smoking advice on mortality. Contrary to a previous perception that PCPs cannot influence patients' behaviour (Wechsler *et al.*, 1983), the current review further shows that PCPs now offer educational and counselling services to their patients to enhance their health literacy with the view improving their health outcome (Alvarez *et al.*, 2018).

The included literature highlighted PCPs' screening for early detection of cancers, and this corroborates with existing studies (Martires *et al.*, 2014; Selby, Bartlett-Esquilant and Cornuz, 2018; Saman *et al.*, 2019). Similarly, Martires *et al.*, (2014) showed that cancer screening across the population may not adhere to evidence-based practices and may not be targeting patients thought to be most at risk. The study of Rim *et al.*, (2014) in which PCPs discuss with their patients on the merits and demerits of screening for prostate cancer corroborates with the screening guidelines for prostate cancer which advocates for shared decision making (Loeb, 2014). Furthermore, both studies highlighted on the controversies associated with prostate cancer screening related to the unnecessary biopsies due to false-positive PSA tests, over-diagnosis of some insignificant cancers, and potential side-effects from prostate biopsy and/or prostate cancer treatment.

With regards to maternal and child health interventions, our results of improved maternal and child health outcomes being associated with PCPs are consistent with those of existing studies. The rise of PCP by one per 10,000 population has been associated with a reduction in maternal mortality, reduction in low birth weight and decrease in perinatal mortality (Zhou *et al.*, 2020). Vaccination is an essential public health intervention undertaken by PCPs. Parents that received vaccine information from physicians proved to be less likely to present with vaccination related challenges when compared to those that received theirs from friends and family (Shen and Dubey, 2019). This finding corroborates with our finding in which PCPs ensured maintenance of consistency in immunization coverage. Barriers to HP and DP practices such as poor budgetary allocations, lack of time, and negative patients' attitudes have been reported (Melariri, Kalinda and Chimbari, 2021). These barriers are consistent with findings from the current review.

Our review showed that some of the current studies were fraught with conceptual vagueness and methodological limitations. A major weakness observed in some studies was application of poorly validated measuring instruments and failing to use multivariate analysis. Limited studies on the subject have been conducted in the African continent.

Strengths and Limitations

The strengths of this systematic review rests on the extensive literature search and appraisal of the included studies. A team of multi-disciplinary experts enriched the study by their several roles in the review's design, appraisal, data extraction and synthesis steps. Their roles in providing diverse reinterpretations to the synthesised results did not only enrich the study, but also enhanced credibility and consistency of the findings. The study was not devoid of limitations. Firstly, our synthesis primarily considered roles of PCPs. The roles of other key players such as dieticians, physiotherapists, and nurses in the healthcare system were excluded. This provides a theme for future studies. Secondly, this study only searched the following databases - EBSCOhost (CINAHL, Health Source- Nursing/Academic Edition, MEDLINE), and Pubmed and included only studies reported in English language. This could have led to important studies been omitted based on our restrictions. This shortfall was however augmented by a manual search using a citation search, the amount of which is considerable and sufficient to fill the gap.

Conclusion

We conducted a systematic review of the literature on HP and DP from the perspective of the PCP that can be extrapolated to any context of HP and DP interventions. The review showed that PCPs are well positioned to effectively employ HP and DP interventions but their full potential in this regard has not been realized. Evidence synthesised from the review shows that most influencing factors for PCP's HP and DP practice were beyond the control of the PCP. To successfully overcome some of the identified barriers requires changes both in the structure and function of healthcare delivery.

Recommendations

For PCPs HP and DP interventions to be carried out and sustained, a range of factors need be considered.

Inadequate knowledge and training on HP and DP were frequently cited barriers. HP and DP should be included in undergraduate medical curriculum as well as part of continuous professional development while on the career. Adequate reimbursement through both medical aid schemes and state financial budgetary allocations for HP and DP will not only motivate PCPs but also serve as attractions for other healthcare professionals to provide their support. Regarding patients' negative perceptions, use of public media to elicit and strengthen health promoting behaviours with the aim of embedding this in a culture of health has been advocated (Fineberg, 2013). Since PCPs HP and DP practices related to mental health and substance abuse were only supported by two studies, it is recommended that more on this topic be explored. Furthermore, findings from this review need to be complemented with a study on patients view regarding the roles of PCPs in HP and DP as well as similar studies in the African continent.

Acknowledgements

The authors would like to acknowledge the authors of the included studies in this review.

Credit Author Statement

HM: Conceptualization, Methodology, Software, Formal analysis, Investigation, Data Curation, Writing - Original Draft, Writing - Review & Editing, Project administration, Funding acquisition

WTB: Methodology, Formal analysis, Investigation, Data Curation, Writing - Review & Editing,

MJC: Conceptualization, Methodology, Investigation, Data Curation, Writing - Review & Editing, Supervision, Project administration, Funding acquisition

Declaration of Competing Interest

The authors declare no conflicts of interest

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1.3 STATEMENT OF THE PROBLEM

South Africa records significant social inequities (4), which may be associated with the quadruple disease burden in the country. A previous study in the rural Eastern Cape Province reported the infant mortality rate (IMR) of 40.3 per 1000 live births, from the 2011 Census. The aforementioned IMR is double that of the Western Cape which recorded an IMR of 20.4 per 1 000 live births (60). There are also significant differences within a given province. In the Western Cape Province, it was reported that the maternal mortality in urban Cape Town relative to facility ratio is 56 per 100 000 live births while 371 per 100 000 live births was recorded in the rural district of the Central Karoo. This suggests the need to evaluate the extent of involvement of health care workers in the promotion of patients' health in the various municipalities in the province.

Inequity further places a huge burden on the public health system which handles majority of the patients as against the private health system that has far higher running revenue yet with far low volume of patients and disease burden. A previous study observed that 50% of health promoters have only achieved matriculation certificate (3). The aforementioned suggests that Health Promotion in South Africa is predominantly dominated by untrained workforce. The disease burden continues to be on the rise. The degree of involvement /practice of HP by the health workers remain unascertained, yet these group of people are the most consulted in the face of most medical issues. Part of concerns include: 1) Poor attitude to work; 2) Poor knowledge on health promotion; 3) Low level of training about HP; 4) Overburdening of tertiary health institutions. Burnout of HCWs because of daily high volume of patients with preventable diseases speaks to the low-level HP knowledge and or acceptance in the communities. Among HCWs at all levels of healthcare delivery in the NMBM, it remains uncertain what is expected of them with regards to HP practice, yet they are invaluable resource strategically positioned to make a difference. There is currently no evidence in the literature regarding HP practices by HCWs in the municipality. Emphasis on health delivery has focussed on diagnosis and treatment, and the healthcare system chasing these goals continually lag in attempts to catch up with the pressure.

There is a tremendous need for coordinated and effective Health promotion practices among health workers in the NMBM. As the economy continues to decline and the state cuts services for citizens, the need for more cost effective and coordinated community-based solutions deepens throughout the study area.

There is need to understand the involvement of HCWs in providing health information and education sessions as well as monitoring or follow up sessions to patients (in and out of the hospital). The HCWs involvement and training on health awareness programmes or campaigns and overall HP practices of HCWs were evaluated in this study.

1.4 AIM, RESEARCH QUESTIONS, AND OBJECTIVES

1.4.1 Aim

To evaluate the Health Promotion (HP) practices of Health Care Workers (HCWs) in the Nelson Mandela Bay Metropolitan (NMBM). To achieve this aim, the following research questions and objectives were pursued.

1.4.2 Research Questions

1. What are the possible indicators for measuring HCW's HP practices in NMBM?
2. What factors enable or hinder the practice of HP by HCWs in NMBM?
3. Is there an association between HCWs training, attitude, and practice of HP in NMBM?
4. Is there an association between HP services at the primary and tertiary healthcare levels in the study area?
5. What are the views of patients regarding the HP services they receive from HCWs in the NMBM healthcare services?

Based on the identified research questions the following objectives (general and specific) were crafted to guide the study.

1.4.3 General Objective

To evaluate HCWs' HP knowledge and practices in NMBM.

1.4.4 Specific Objectives

1. To identify and evaluate the indicators for measuring HCWs HP practices in the NMBM.
2. To determine the enablers and hindrances to HP services by HCWs in the NMBM
3. To identify and analyse the relationship between HCWs training, attitude, and practice of HP in the NMBM
4. To identify and comparatively evaluate the relationship between HP services at the primary and tertiary healthcare levels in the study area.
5. To assess the views of patients regarding quality of HP services they received from HCWs in the NMBM healthcare services.

1.5 GENERAL METHODOLOGY

1.5.1 Study design

The study was a quantitative cross-sectional design involving two phases. Phase one focussed on HCWs at the primary, secondary, and tertiary public healthcare facilities in the NMBM, while phase two focussed on patients sampled from a public tertiary hospital in the municipality (see Figure 3). A quantitative cross-sectional study was conducted in both phases to address the study aim and objectives. In phase one, 495 HCWs randomly sampled from 23 healthcare facilities in NMBM completed a self-administered structured questionnaire. Furthermore, phase two elicited responses from 500 patients who completed the structured questionnaire on the quality of HP services received using the interview method. Data analysis was performed using StataIC 15. Descriptive and inferential statistics were used in summarizing the results. Details of the specific methodology relative to each objective are described in each manuscript/publication in the subsequent chapters.

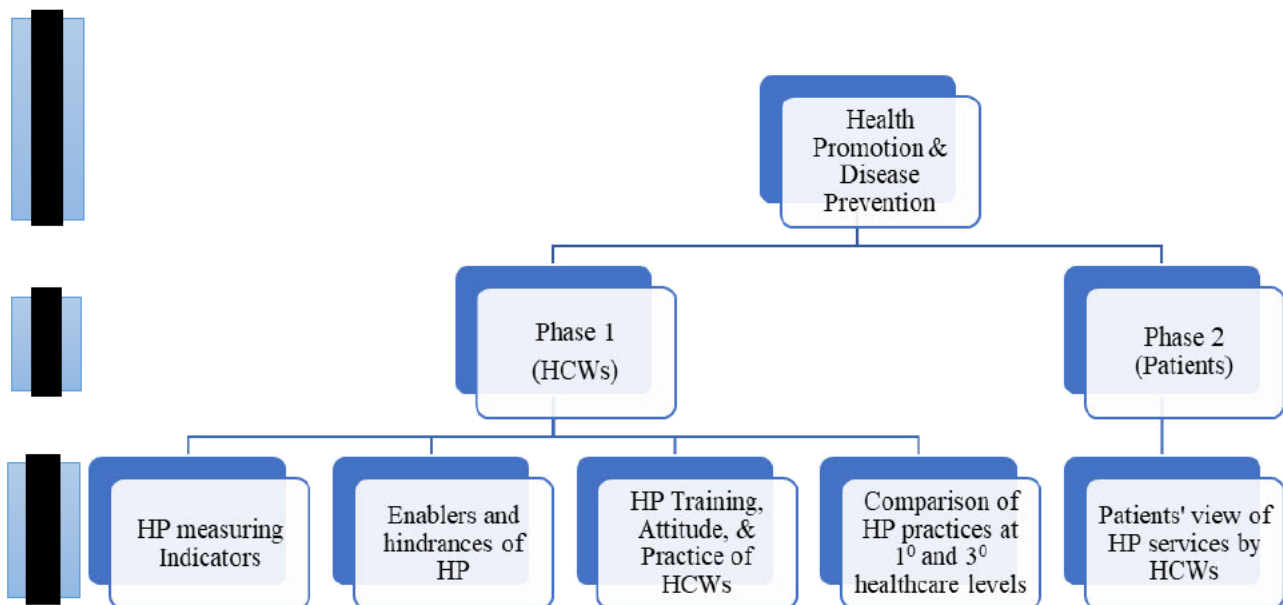


Figure 3: Flow diagram of research project showing study phases and objectives

1.5.2 Setting

The NMBM is one of eight category A municipalities (a category A municipality that has exclusive municipal executive and legislative authority in its area) in South Africa. The NMBM is situated in the Eastern Cape (EC) province with an area of 1957KM², and a population of 1 271 776 (61). The NMBM divided into three health sub-districts – A, B, and C (Figure 4). The municipality comprises of the following major races - blacks, coloured, whites and Indians. The major languages spoken are English, Isi-Xhosa and Afrikaans.

Commonly referred to as the "friendly city" or the "water sports capital of Africa", the NMBM is the major access to the EC province and the world-renowned Garden Route. The municipality's population makes up 17% of EC province population and 2.8% of South African population (62). Similar to the national population growth of 1.61%, the municipality's growth rate between 2008 and 2018 was 1.47% (62). The municipality is a major economic player at both the provincial and national levels. In 2018, the municipality had a GDP of R128 billion, contributing 34.07% and 2.63% respectively to the provincial and national GDP. Despite its large economy, poverty and unemployment remains a concern in the municipality. In 2020, the unemployment rate was 40.4% (63). Other poverty related challenges facing the NMBM include overcrowding in the townships, informal settlements, poor infrastructure, and social inequalities. These contribute to most of the preventable diseases presenting in the health care facilities. According to Statistics South Africa, the NMBM has a low life expectancy (Males – 59.6 years, females - 67.1 years) relative to the national values (males 61.5 years, female - 67.7 years) (64). In South Africa, two sectors are operational in the healthcare system, namely public and private. The public sector is divided into primary, secondary, and tertiary healthcare levels and are government funded, serving most of the population. The private sector is privately funded by citizens or individuals who can afford to purchase private health insurance.

The private health sector in South Africa offer better services such as shorter waiting times, proper hygiene, and better DP practices (65). In contrast, the public healthcare services are challenged with longer waiting times, poor infrastructures, rushed appointments due to overcrowding, and poor hygiene and DP services. Only 21.7% of the municipality's population are members of a health insurance scheme (66). The rest of the population are catered for by the overstretched public health system.

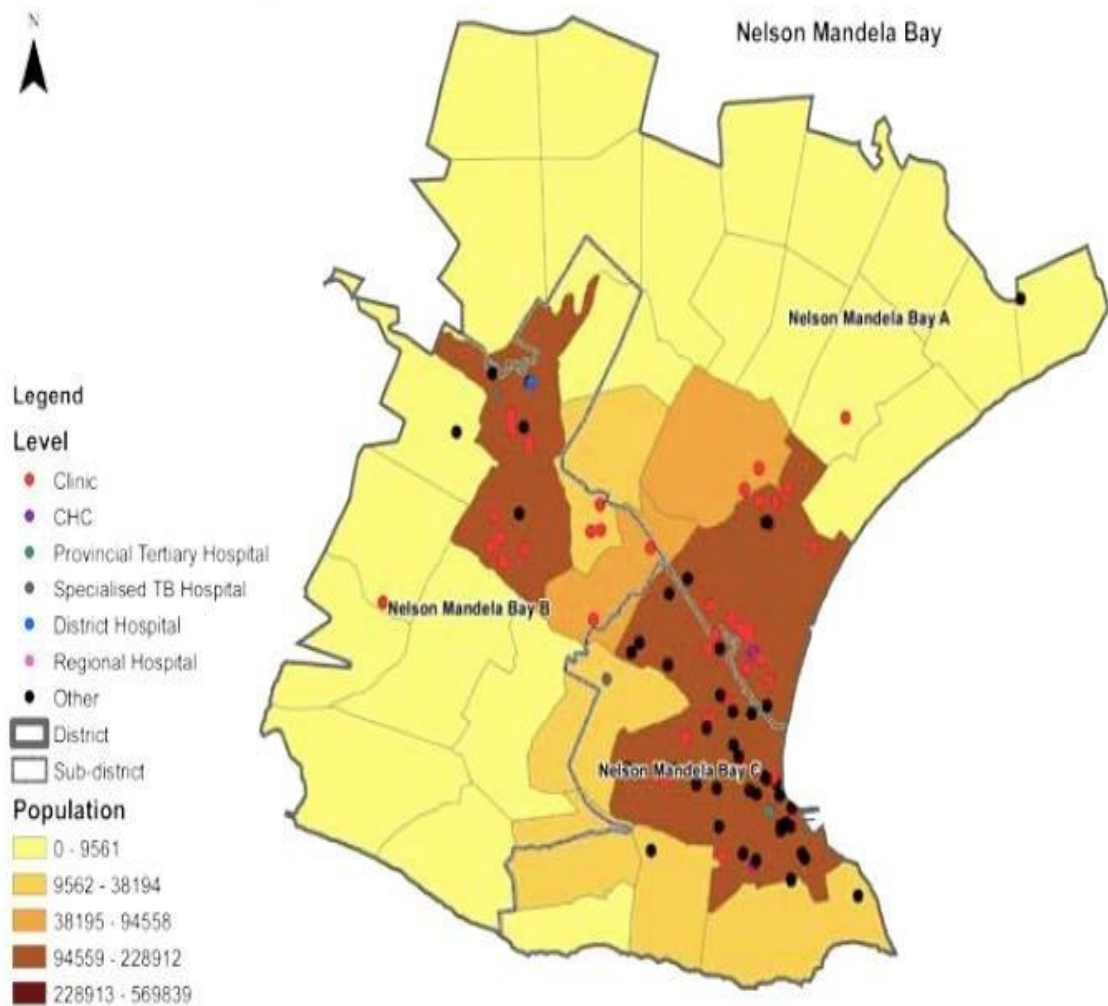


Figure 4: Map of Nelson Mandela Bay Metro (NMBM) Source: DHS Barometer 2016/17 (67)

1.5.3 Sampling

The NMBM has an estimated workforce of about 3500 HCWs. For the first phase of the study, a sample size of 384 respondents was determined based on a 95% confidence level and an error margin of 5%. The initial sample size was adjusted by 25% to 480 to cater for non-response. A total of 495 HCWs comprising medical doctors, nurses, and allied health workers (physiotherapists, speech therapists, social workers, dieticians, and occupational therapists) were randomly sampled from 23 public healthcare facilities in the municipality (figure 5). The sampling was done according to the various levels of healthcare facilities (Primary, secondary and tertiary) and along professional lines. Only HCWs that consented were enrolled into the study. For the second phase of the study, 500 patients who visited the tertiary hospital within the study period were selected using a homogenous purposive sampling strategy (68). The hospital selected for this second phase is the biggest tertiary hospital in the

municipality and serves patients from all other areas in the municipality. The sampling strategy ensured that patients included in the study had been fully attended to by HCWs in the facility either in the current or previous visits to the tertiary hospital. Data collection in the first phase was conducted using standardised and piloted questionnaire adopted from an existing World Health Organization study (69) and modified to include additional questions and adapted to fit the South Africa Health system. In the second phase, data collection was done through an interview using a structured questionnaire by the principal investigator and trained field workers. Only patients who signed consents were included in the study. To maintain confidentiality, participant identifiers were substituted with codes and data stored in computers with secret passwords. Descriptive and inferential analyses was conducted using StataIC 15 (Stata Statistical Software: Release 15. College Station, TX: StataCorp LLC).

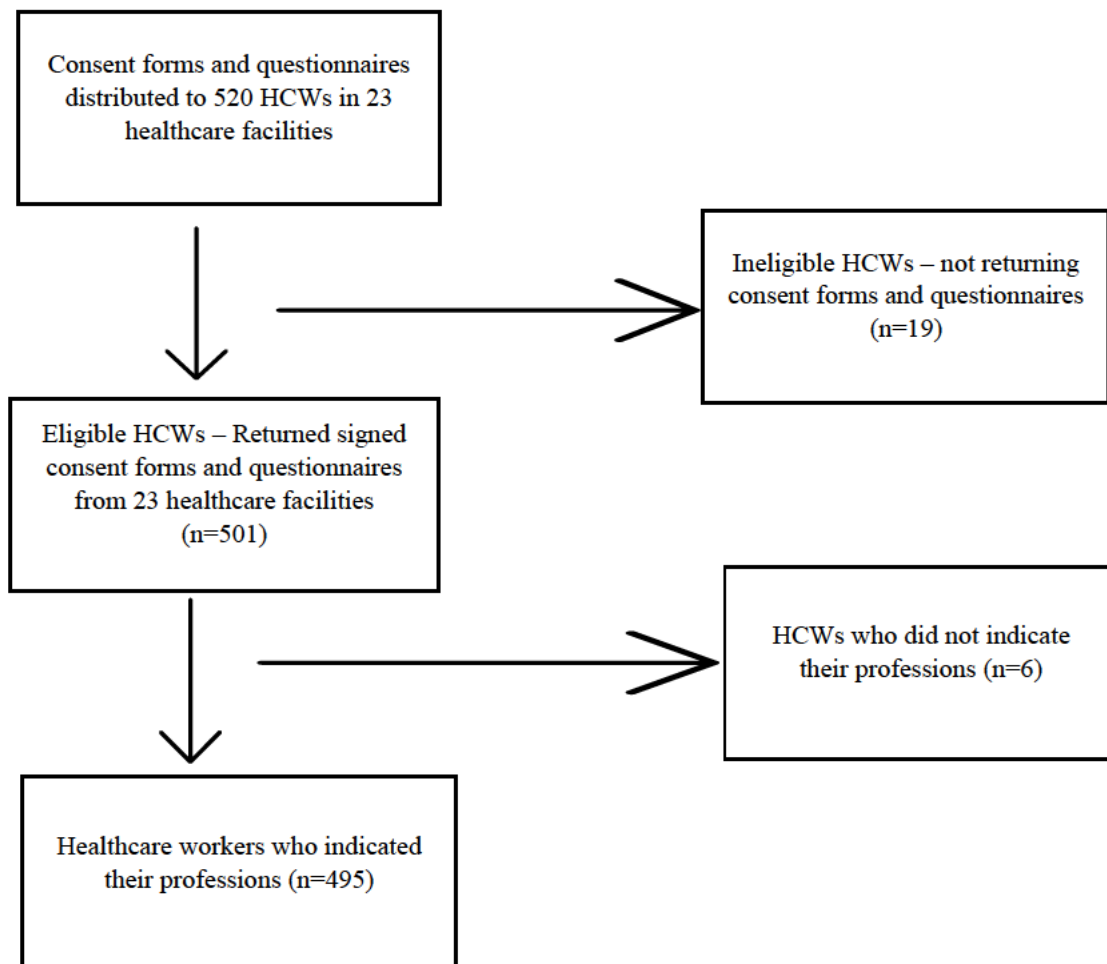


Figure 5. Sampling methodology of healthcare workers in the NMBM

1.6 ETHICS APPROVAL AND CONSENT TO PARTICIPATE

The study protocol for this PhD research received ethical approvals from the University of KwaZulu Natal Biomedical Research Ethics committee (BREC), reference number – BREC /00000088/2019. Subsequent approval was received from the Eastern Cape Health Research committee, reference – EC_201910_012. Other approvals were received from gatekeepers of the specific healthcare facilities. A written informed consent was received from all participants before proceeding with the study's data collection (All approvals and consent forms are presented in Appendix).

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<https://apps.who.int/iris/bitstream/handle/10665/107737/E88584.pdf?sequence=1&isAllowed=y>

In the first chapter, the thesis started with a general overview and an introductory section. It further presented a background analysis of healthcare workers and health promotion services; a historical evolution of the health promoting hospitals; the health promoting hospital initiative of 1988, and motivations for health promoting hospitals. Furthermore, this chapter systematically reviewed the literature and identified six themes around which the HP practices of primary care physicians was centered on. The theme that was most studied was ‘Activities aimed at promoting healthy conditions, lifestyles, behaviour, and environments’, which was analyzed by twenty-three studies. The review further identified barriers to Primary Care Physician’s Health Promotion and Disease Prevention practice, and this was supported by seven studies. Inadequate knowledge, lack of time, patients’ unwillingness to change their lifestyle, insufficient re-imburement for HP services, and poor interdisciplinary collaborations were commonly cited barriers. Finally, this chapter provided details on the problem statement and gap in HP knowledge and HP practices among HCWs in the NMBM, hypothesis and study aim and ends with a general methodology and ethical consideration.

The next chapter (chapter two) will feature the indicators for measuring health promotion practices among healthcare workers. Chapter two segregated the findings at the three levels of healthcare facilities (primary, secondary and tertiary levels) under consideration and duly addresses the first research objective and part of the fourth objective of this thesis.

Chapter 2

Indicators for measuring health promotion practice among healthcare workers in the Nelson Mandela Bay Municipality, South Africa: A cross sectional study

Herbert I. Melariri, Moses J. Chimbari, Chester Kalinda, 2022 Indicators for measuring health promotion practice among healthcare workers in the Nelson Mandela Bay Municipality, South Africa: A cross sectional study. South African Family Practice <http://doi.org/10.4102/safp.v64i1.5401> ISBN: 2078-6190

Indicators for measuring health promotion practice among healthcare workers in the Nelson Mandela Bay Municipality, South Africa: A cross-sectional study



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Dates:

Received: 27 Aug. 2021
Accepted: 03 Mar. 2022
Published: [to be released]

How to cite this article:

Melariri HI, Kalinda C, Chimbari MJ. Indicators for measuring health promotion practice among healthcare workers in the Nelson Mandela Bay Municipality, South Africa: A cross-sectional study. *S Afr Fam Pract.* 2022;64(1), a5401. <https://doi.org/10.4102/safp.v64i1.5401>

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Background: Measuring indicators for health promotion (HP) practice among healthcare workers is essential if health goals and objectives must be achieved. Such indicators provide connections between health policies and health outcomes, ultimately adding value to health care. This study identified indicators of health promotion among healthcare workers and compared them across levels of healthcare facilities in Nelson Mandela Bay Municipality (NMBM), South Africa.

Methods: A cross-sectional study involving 495 healthcare workers randomly sampled from 23 health facilities was conducted. Questionnaires were distributed to medical doctors, nurses and allied health workers (AHWs). Questions (hereto referred to as dimensions) in the questionnaires were categorised to address facility-related indicators (FRIs), health worker-related indicators (HRIs) and outcome-related indicators (ORIs). Descriptive and bivariate analyses were used to identify the indicators of HP among the three HCW groups from the three levels of health care. Indicators observed to be significant in the bivariate analysis were subjected to multivariate analysis using the multinomial regression model.

Results: Emerging Indicators were grouped into three categories: FRIs, HRIs and ORIs. Four FRI dimensions were observed to be predictors of HP among doctors. Two dimensions were positively associated with HP practices, while two others were negatively associated with HP practices among medical doctors and AHWs. However, seven HRI dimensions were significantly associated with HP among medical doctors and AHW. Furthermore, five ORI dimensions were significant predictors of HP among medical doctors, while only two dimensions were predictors of HP among AHW.

Conclusion: This study has identified indicator dimensions reported by HCWs for measuring HP practices among them. These indicators that healthcare workers and health systems managers in the study area should be aware of may be adapted for use in other areas.

Keywords: health promotion; healthcare worker; practice; measuring; indicators; outcome; patient.

Background

Performance measurement of health promotion (HP) practice among healthcare workers (HCWs) is a contemporary theme worldwide in health systems.^{1,2} However, there is no consensus on the approach for measuring HP practice among HCWs. For instance, existing HP indicators focus on specific HP programmes and not on overall HP practices of HCWs.^{3,4} Developing such indicators will provide the health system tools for assessing the effectiveness and quality of HP services by the HCWs. This will improve the performance of HCWs to discharge HP services and ultimately reduce pressure at healthcare facilities as patients and the general community become empowered. Clearly defined indicators are critical as instruments for methodical execution of HP practices. This enhances practice objectivity, improves understanding, decision making, ensures feedback on the way things are progressing and also provides for prompt warning signs to authorities.⁵

According to the International Society for Quality in Health Care, an indicator is a vital tool that serves as a 'measure of health system performance'.⁶ Timely and comprehensive identification and evaluation of the indicators associated with the organisational structure

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and processes, as well as outcomes, are relevant for the effective assessment of HP services by HCWs.⁷ Health promotion indicators have the potentials to assist HCWs and facility managers to improve on the performances and HP services of HCWs. A previous study on performance indicators identified various dimensions on the integration of healthcare and HP services and orientation towards patients' needs and expectations.⁸

Health promotion indicators for certain health conditions have been identified by international bodies. The Danish National Indicator Project (DGMA) has identified for Denmark, 'secondary medical prophylaxis and assessment of rehabilitation needs' as HP indicators for stroke.⁹ The DGMA study further identified assessment of patients' nutritional needs as a measurement indicator for hip fracture, while HP indicators for schizophrenia sought to address issues relating to family support and psychoeducation of patients by HCWs. Indicators for congestive heart failure emphasise the need to assess patients' requirements concerning nutrition, physical exercise, education and readmission rate. Furthermore, the World Health Organization (WHO) working groups recommended management policy, patient assessment, patient information and intervention, promoting a healthy workplace as well as continuity and cooperation as dimensions for further consideration as HP indicators.⁹ In the current study, there was a dearth of information on indicators for measuring HP practices among HCWs in health facilities in the study area. A previous study reported on the absence of HP practice guidelines in the municipality as a hindrance to HCWs' HP practice¹⁰ in the study area. Furthermore, lack of training in HP amongst HCWs, especially those at the tertiary level, has been identified as a drawback to the HP services by HCWs¹¹ in the municipality.

The success of any healthcare system is largely dependent on the performance of HCWs, and worldwide, millions of patients visit the healthcare facilities daily to meet the HCWs for various health needs. Establishing a set of indicators for measuring HP practices among HCWs will enhance HP awareness and practice among the HCWs. Such HP indicators will provide HCWs with vital tools for systematically conducting follow-up and have an effective HP practice.³ These tools will assist in unraveling areas for improvement and intervention. Good sets of indicators will assist policymakers and stakeholders to monitor and evaluate HP practices of HCWs. Metrics for such measurement will require clear HP indicators and a framework that integrates relationships across the different elements of HP practices. This study was aimed at identifying indicators for HP practice among HCWs from different healthcare levels in the Nelson Mandela Bay Municipality, South Africa.

Method

Study setting

This study was set to identify indicators for measuring HP practice among HCWs in the NMBM. The Nelson Mandela

Bay municipality is one of the eight category A or metropolitan municipalities¹² in South Africa, and the largest of two Category A Metropolitan Municipalities in the Southern Coast of the Eastern Cape (EC) province.¹³ The NMBM has a health district – Nelson Mandela Bay Health District (NMBHD) - under which the primary health facilities operate. The NMBHD is one of the eight health districts in the EC province.¹⁴ The NMBHD is further divided into three sub-districts, A, B and C, with 53 primary health facilities.¹¹ The

TABLE 1: Associations between healthcare workers and facility-related indicator dimensions.

FRI dimension	Responses	Healthcare workers						p
		Doctors		Nurses		AHWs		
		n	%	n	%	n	%	
HP communication channel	No	156	33.5	98	21.0	38	8.2	< 0.001
	Yes	28	6.0	118	25.3	28	6.0	
HP coordinator	No	72	15.0	53	11.1	11	2.3	< 0.001
	Yes	14	2.9	103	21.5	22	4.6	
	I don't know	102	21.3	68	14.2	34	7.1	
HP budget	No	40	8.3	41	8.5	19	3.9	< 0.001
	Yes	1	0.2	35	7.2	5	1.0	
	I don't know	149	30.7	151	31.1	44	9.1	
Data routinely captured on HP interventions	No	54	11.2	31	6.4	14	2.9	< 0.001
	Yes	6	1.3	91	18.9	10	2.1	
	I don't know	130	26.9	102	21.2	44	9.1	
Data available to staff for HP evaluation	No	57	11.8	50	10.4	13	2.7	< 0.001
	Yes	6	1.3	82	17.0	10	2.1	
	I don't know	125	25.9	94	19.5	45	9.3	
HP structures and facilities	No	65	13.7	76	16.1	16	3.3	> 0.05
	Yes	119	25.2	147	31.1	50	10.6	
HP quality assessment programme	No	38	8.1	31	6.6	9	2.0	< 0.001
	Yes	16	3.6	105	22.4	16	3.4	
	I don't know	131	28.0	81	17.3	41	8.8	
Provision to assess patient HP need	No	126	28.0	59	13.1	29	6.4	< 0.001
	Yes	54	12.0	154	34.1	29	6.4	
HP need assessment done at first contact with hospital	No	36	14.3	50	19.8	13	5.2	> 0.05
	Yes	38	15.1	98	38.9	17	6.7	
Documentation of patient's HP record	No	73	15.6	35	7.5	19	4.1	< 0.001
	Yes	36	7.7	129	27.6	21	4.5	
	I don't know	74	15.9	53	11.3	27	5.8	
Guidelines for reassessing patients' HP need at discharge	No	70	14.9	44	9.4	17	3.6	< 0.001
	Yes	22	4.7	100	21.3	10	2.1	
	I don't know	93	19.8	75	15.9	39	8.3	
Guidelines for reassessing patients' HP need post intervention	No	68	14.6	43	9.2	19	4.1	< 0.001
	Yes	25	5.4	99	21.2	10	2.2	
	I don't know	93	19.9	72	15.5	37	7.9	
Update on patients' sociocultural background	No	59	12.4	36	7.6	8	1.7	< 0.001
	Yes	54	11.3	155	32.5	41	8.6	
	I don't know	73	15.3	32	6.7	19	3.9	
Any HP policy	No	30	6.3	12	2.5	7	1.5	< 0.001
	Yes	16	3.4	107	22.6	11	2.3	
	I don't know	142	30.0	99	21.0	49	10.4	
HP induction training for new staff	No	77	16.3	34	7.2	21	4.4	< 0.001
	Yes	11	2.3	119	25.2	17	3.6	
	I don't know	100	21.1	66	14.0	28	5.9	
HP performance appraisal system	No	69	14.6	47	10.0	14	3.0	< 0.001
	Yes	9	1.9	100	21.2	9	1.9	
	I don't know	110	23.3	71	15.0	43	9.1	

FRI, facility-related indicators; AHW, allied health workers; HP, health promotion.

TABLE 2: Facility-related indicator dimensions at different levels of health care.

FRI dimensions	Profession			Primary healthcare level			Secondary healthcare level			Tertiary healthcare level			p							
	N	Yes		No	I don't know	p	Yes	No		I don't know	p	Yes		No		I don't know				
		%	n					%	n					%	n		%	n	%	n
Any communication channel for HP in your facility	3	2.48	4	3.31	0	0.00	0.447	1	6.25	5	31.25	0.00	0.117*	24	7.29	147	44.58	0	0.00	0.000
	64	52.90	42	34.71	0	0.00		2	12.50	1	6.25	0	0.00	52	15.81	55	16.72	0	0.00	
	6	4.96	2	1.65	0	0.00		5	31.25	2	12.50	0	0.00	17	5.17	34	10.33	0	0.00	
HP coordinator	1	0.78	2	1.55	4	3.10	0.197	0	0.00	5	31.25	1	6.25	13	3.89	65	19.46	97	29.04	0.000
	67	51.94	21	16.28	26	20.16		1	6.25	1	6.25	1	6.25	35	10.48	31	9.28	41	12.28	
	5	3.88	1	0.08	2	1.55		2	12.50	2	12.50	7	43.75	15	4.49	8	2.40	29	8.68	
HP budget	0	0.00	2	12.50	5	31.25	0.284	0	0.00	3	18.75	3	18.75	1	0.29	35	10.26	141	41.39	0.000
	15	11.72	24	18.75	74	57.81		0	0.00	0	0.00	3	18.75	20	5.87	17	4.99	74	21.70	
	0	0.00	4	3.13	4	3.13		0	0.00	1	6.25	6	37.50	5	1.47	14	4.11	34	9.97	
Data routinely captured on HP interventions?	2	1.56	0	0.00	5	3.91	0.384	0	0.00	3	18.75	3	18.75	4	1.18	51	15.09	122	33.14	0.000
	57	44.53	17	13.28	39	30.47		1	6.25	0	0.00	2	12.50	33	9.76	14	4.14	61	18.05	
	4	3.13	1	0.78	3	2.34		0	0.00	1	6.25	6	37.50	6	1.78	12	3.55	35	10.36	
Data available to staff for HP evaluation?	2	1.57	1	0.79	4	3.15	0.669	0	0.00	3	18.75	3	18.75	4	1.12	53	15.63	118	34.81	0.000
	49	38.58	27	21.26	36	28.35		1	6.25	0	0.00	2	12.50	32	9.44	23	6.79	56	16.52	
	4	3.15	1	0.79	3	2.36		0	0.00	2	12.50	5	31.25	6	1.77	10	2.95	37	10.91	
HP structures and facilities required	5	3.97	2	1.59	0	0.00	0.865	5	31.25	1	6.25	0	0.00	109	32.93	62	18.73	0	0.00	0.356
	74	58.73	37	29.37	0	0.00		2	12.50	1	6.25	0	0.00	71	21.45	38	11.48	0	0.00	
	6	4.76	2	1.59	0	0.00		6	37.50	1	6.25	0	0.00	38	11.48	13	3.93	0	0.00	
HP quality assessment programme	2	1.65	2	1.65	3	2.48	0.052	0	0.00	1	6.25	5	31.25	14	4.23	35	10.57	123	37.16	0.000
	50	41.32	18	14.88	38	31.40		1	6.25	0	0.00	2	12.50	54	16.31	13	3.93	41	12.39	
	1	0.83	0	0.00	7	5.79		3	2.48	1	6.25	3	18.75	12	3.66	8	2.42	31	9.37	
Provision to access patients HP need	3	2.48	4	3.31	0	0.00	0.137	2	12.50	4	25.00	0	0.00	49	5.41	118	37.11	1	0.31	0.000
	60	49.59	26	21.49	0	0.00		2	12.50	1	6.25	0	0.00	74	23.27	32	10.06	1	0.31	
	5	4.13	3	2.48	0	0.00		6	37.50	1	6.25	0	0.00	18	5.66	25	7.86	0	0.00	
HP need assessment done at first contact with hospital	4	5.00	0	0.00	0	0.00	0.562	1	11.11	1	11.11	0	0.00	33	20.00	35	21.21	0	0.00	0.549
	56	70.00	16	20.00	0	0.00		2	22.22	0	0.00	0	0.00	40	24.24	34	20.60	2	1.12	
	3	3.75	1	1.25	0	0.00		2	22.22	3	33.33	0	0.00	12	7.27	9	5.45	0	0.00	
Documentation of patient's HP record	1	0.83	3	2.48	3	2.48	0.061	0	0.00	3	18.75	3	18.75	35	10.61	67	20.30	68	20.61	0.000
	66	54.55	13	10.74	27	22.31		2	12.50	0	0.00	1	6.25	61	18.49	22	6.67	25	7.58	
	23	19.01	2	1.65	3	2.48		3	18.75	1	6.25	3	18.75	15	4.55	16	4.85	21	6.36	
Guidelines for reassessing patients HP needs at discharge	1	0.84	3	2.52	3	2.52	0.228	0	0.00	3	18.75	3	18.75	21	6.27	64	19.10	87	25.97	0.000
	41	34.45	18	15.13	46	38.66		2	12.50	1	6.25	0	0.00	57	17.02	25	7.46	29	8.66	
	2	1.68	3	2.52	2	1.68		2	12.50	0	0.00	5	31.25	6	1.79	14	4.18	32	9.55	
Guidelines for reassessing patients HP needs post-intervention	2	1.67	2	1.67	3	2.50	0.835	0	0.00	3	18.75	3	18.75	23	6.97	63	19.09	87	26.36	0.000
	45	37.50	16	13.33	44	36.67		1	6.25	0	0.00	2	12.50	53	16.06	27	8.18	26	7.88	
	3	2.50	2	1.67	3	2.50		1	6.25	1	6.25	5	31.25	6	1.81	16	4.85	29	8.79	
Update on patient's socio-cultural background	1	0.81	3	2.44	3	2.44	0.020	1	6.25	2	12.50	3	18.75	52	15.38	54	15.98	67	19.82	0.000
	71	57.72	19	15.45	18	14.63		1	6.25	1	6.25	1	6.25	83	24.56	16	4.73	13	3.85	
	3	2.44	4	3.25	1	0.81		3	18.75	1	6.25	3	18.75	35	10.36	3	0.89	15	4.44	

Table 2 continues on the next page →

TABLE 2 (Continues...): Facility-related indicator dimensions at different levels of health care.

FRI dimensions	Profession			Primary healthcare level						Secondary healthcare level						Tertiary healthcare level					
	N	Yes		No	I don't know	p	Yes		No		I don't know		p	Yes		No		I don't know		p	
		%	n				%	n	%	n	%	n		%	n	%	n	%	n		%
Any health promotion policy	0	0.00	2	1.63	5	4.07	0.034	1	6.25	1	6.25	4	25.00	0.683	15	4.49	27	8.08	133	39.82	0.000
Nurses	51	41.46	6	4.88	51	41.46		1	6.25	0	0.00	2	12.50		55	16.47	6	1.80	46	13.77	
Allied HW	3	2.44	0	0.00	5	4.07		1	6.25	0	0.00	6	37.50		7	2.10	7	2.10	38	11.38	
HP induction training for new staff	2	1.61	2	1.61	3	2.42	0.468	0	0.00	3	18.75	3	18.75	0.251*	9	2.70	72	21.62	94	28.23	0.000
Nurses	45	36.29	24	19.35	40	32.26		2	12.50	0	0.00	1	6.25		72	21.62	10	3.00	25	7.51	
Allied HW	2	1.61	4	3.23	2	1.61		2	12.50	2	12.50	3	18.75		13	3.90	15	4.50	23	6.91	
HP performance appraisal system	1	0.81	4	3.25	2	1.63	0.151	0	0.00	3	18.75	3	18.75	0.773*	8	2.40	62	18.62	105	31.53	0.000
Nurses	43	34.96	27	21.95	38	30.89		0	0.00	1	6.25	2	12.50		57	17.11	19	5.71	31	9.31	
Allied HW	1	0.81	2	1.61	5	4.07		1	6.25	2	12.50	4	25.00		7	2.10	10	3.00	34	10.21	

FRI, facility-related indicators; HW, health workers; HP, health promotion.

*, Some cells have frequencies equal to or less than 5.

municipality further has one secondary and three tertiary hospitals that operate directly under the provincial health department.

With a population of 1271776, the NMBM makes up approximately 17% of the population of the EC province.¹³ The municipality comprised of the City of Port Elizabeth, Despatch, Uitenhage,¹⁵ peri-urban as well as rural areas. The population is diverse with black people being the majority, followed by coloured and whites. The NMBM has the largest economy in the province largely driven by the automotive industry and tourism sector. However, the municipality is laden with major challenges of poverty, overcrowding in townships, informal settlements, unemployment social inequalities, poor infrastructure and poor service delivery. The EC province's official unemployment rate was 36.9% in 2020¹⁶ and has a low life expectancy (males – 59.6 years, females – 67.1 years) compared with the national life expectancy (males 61.5 years, females – 67.7 years).¹⁷ The major causes of death include many preventable causes. As is the case for the whole country, the NMBM has primary, secondary and tertiary healthcare facilities.

Study design

A quantitative cross-sectional study was carried out between January 2020 and March 2020 in 23 public hospitals in the NMBM. Sampled hospitals included primary, secondary and tertiary hospitals. The study population included HCWs comprising medical doctors, nurses and allied health workers (AHWs) (physiotherapists, occupational therapists, speech therapists, dieticians and social workers) working in the public health system of the NMBM. The municipality's public health system has an estimated workforce of about 3500 HCWs.^{10,11} A sample size of 384 respondents was determined based on a 95% confidence level with an error margin of 5%. The initial sample size was adjusted by 25% to 480 to cater for non-response. Questions (hereto referred to as dimensions) in the questionnaires were categorised to address facility-related indicators (FRI), health worker-related indicators (HRI) and outcome-related indicators (ORI). A total of 520 HCWs were randomly selected for the study. Responses were elicited from the participants using a self-administered questionnaire. Of the 520 who consented to participate in the study, 501 participants returned completed questionnaires. The six participants who did not include their professions were therefore excluded from the final analysis.

Data collection and analysis

A standardised and piloted questionnaire was used, which was adopted from an earlier study,¹⁸ modified to include additional questions and adapted to fit the South Africa Health system. Participating HCWs from 23 health facilities (comprising hospitals, community health centres

and clinics) in the study area completed a self-administered semi-structured questionnaire with the following sections relating to HP and practices: sociodemographic profile of the participant(s) (gender, occupation, level of health care facility, and HP dimensions). The dimensions were categorised as FRIs, HRIs and ORIs. A total of 37 dimensions from the three categories were considered – FRI ($n = 16$), HRI ($n = 13$) and ORI ($n = 8$). Facility-related indicator dimensions included HP communication channel, coordination, HP budget, data capturing and evaluation, HP structure, quality assessment, provision to assess patients' needs, assessment done at first contact, documentation of HP records, availability of guidelines and policies, socio-cultural background, induction training and performance appraisal. Health worker-related indicator dimensions comprised of education on disease condition, guidance on diet and lifestyle, routine check-up, adequate knowledge on patients' condition, fitness and health screening, assistance with welfare services, participation in training, coordinated HP training, home visits, community-based placement (CBP), follow-up, patient empowerment, notification of patient on risk factors. The ORI dimensions included coverage of the target population, reduction in the number of deaths, reduction in the number of diseases, reduction in the number of injuries and disabilities, reducing inequities in health, improved need assessment, and improved community mobilisation and participation. Data collected were captured in Microsoft Excel 2016 Spreadsheet, cleaned and analyzed using StataIC 15 (Stata Statistical Software: Release 15. College Station, TX, StataCorp LLC). Descriptive and inferential statistics were used to describe and analyse the data collected using univariate, bivariate and multivariate statistics. Descriptive statistics were used to summarise the data. Associations between categorical variables were determined using chi-square tests. In our analysis, we controlled for the level of the healthcare facility. Healthcare workers were categorised as medical doctors, nurses and AHWs (social workers, physiotherapists, occupational therapists, and speech therapists). In order to determine the influence of the indicators on the HP dimensions, a multinomial logistic model was fitted with the classification of HCWs as the dependent variable. In order to fit this model, all indicators that had a p -value of <0.1 in the univariate model were used in the model.^{19,20} The fit of the final models for different HP indicators that included a varied number of explanatory variables was assessed using the generalised Hosmer–Lemeshow goodness-of-fit test, chi-square test, and models were regarded as significant if the resulting p -value was > 0.05 .²¹

Ethical consideration

Ethical clearance to conduct this study was obtained from the University of KwaZulu-Natal Biomedical Research Ethics Committee (number: BREC/00000088/2019).

Results

Demographic characteristics

Of the 520 HCWs who were enrolled in the study, only 495 participants were considered for the final analysis. Of these participants, 39.0% ($n = 192$) were medical doctors, 47.0% ($n = 234$) were nurses and 14.0% ($n = 69$) were AHW. The results further show that 26.26% ($n = 130$) of the HCWs were from primary health care, 4.0% ($n = 17$) were from secondary and 70.3% ($n = 348$) were from tertiary healthcare facilities. Among these respondents, 75.42% ($n = 362$) were females, while 24.58% ($n = 118$) were male respondents.

Facility related indicator

Fourteen of 16 FRI dimensions were associated with HP practices among HCWs in the study area. Table 1 shows FRI dimensions that are associated with HCWs in the study. Some of the associated FRI dimensions include HP communication channel, $p < 0.001$, presence of HP coordinator, $p < 0.001$ and update on patients' socio-cultural background, $p < 0.001$.

When corrected for healthcare facility level (Table 2), 14 dimensions such as communication channel for HP in the facility, HP coordinator, HP budget, HP data capturing during interventions, and HP performance appraisal system were associated with HP at the tertiary facility level. Only two dimensions update on patient's socio-cultural background and availability of HP policy were associated with HP at the primary healthcare level. However, none of the FRI dimensions were associated with HP at the secondary healthcare level (Table 2).

Results obtained from a multinomial regression indicated that six dimensions were associated with HP among HCWs (Table 3). For medical doctors, four dimensions were observed to be significant in the final adjusted model. Facility-related indicator dimensions observed to be predictors of HP among doctors were HP data available for evaluation (coefficient [coeff]: 0.988, 95% confidence interval [CI]: 0.369–1.607) and quality assessment programme (coeff: 0.787, 95% CI: 0.208–1.366,) which were observed to be 0.99 and 0.79 times, respectively, higher compared with nurses. Other FRI dimensions – provision to access patients' HP need (coeff: -2.695 , 95% CI: -3.942 to -1.448) and HP need assessment done at first contact with the hospital (coeff: -0.751 , 95% CI: -1.444 to -0.057) were observed to be negative predictors of HP among medical doctors (Table 2).

Health promotion data available for evaluation (coeff: 0.954, 95% CI: 0.149–1.759) and HP structures and facilities required (coeff: 1.787, 95% CI: 0.488–3.087) were positively associated with HP among AHW. These factors were 0.75 and 1.8 times higher compared with nurses, respectively. However, HP Budget (coeff: -0.726 , 95% CI: -1.361 to -0.091) and provision to access patients HP need (coeff: -1.798 , 95% CI: -3.428 to -0.167) were negatively associated with HP practices among AHW (Table 3). The generalised

Hosmer–Lemeshow test chi-square was 16.13 with a *p*-value of 0.444, indicating a good fit of the final model.

Health workers Related Indicator

Ten out of 13 HRI dimensions comprising education on disease condition, guidance on diet and lifestyle, need for a routine check-up, adequate knowledge on patient condition, fitness and health screening, assist with welfare services, participation in HP training, coordinated HP training for staff, home visit, CBPs, and follow-up post-discharge were associated with HP practice among HCWs (Table 4).

At the health facility level (Table 5), eight dimensions such as dietary and lifestyle guidance, fitness and health screening, and participation in HP training were associated with HP at the tertiary level. Three (home visits, CBPs, and post-discharge follow-up) at the secondary level and only one (CBPs) at the primary level (Table 5).

A total of ten HRI dimensions were significantly associated with HP among HCWs when interrogated in multinomial regression analysis (Table 6). Among the medical doctors, significant positive predictors of HP among the HRI dimensions were education on disease condition (coeff: 2.273, 95% CI: 1.393–3.710), guidance on diet and lifestyle (coeff: 0.361, 95% CI: 0.228–0.570), fitness and health screening (coeff: 0.325, 95% CI: 0.224–0.474), coordinated HP training for staff (coeff: 0.216, 95% CI: 0.106–0.441), home visits (coeff: 0.141, 95% CI: 0.039–0.501), and follow-up post-discharge (coeff: 2.743, 95% CI: 1.618–4.648) and patient empowerment (coeff: 3.919, 95% CI: 1.102–13.931). Furthermore, seven significant dimension predictors of HRI emerged among AHWs. These included – education on disease condition (coeff: 2.117, 95% CI: 1.107–4.048) and CBPs (coeff: 3.914, 95% CI: 1.147–13.351) (Table 6). Other dimensions that were significant predictors of HP compared with nurses were need

for routine check-up (coeff: 0.564, 95% CI: 0.389–0.818), fitness and health screening (coeff: 0.448, 95% CI: 0.389–0.818) and (coeff: 1.977, 95% CI: 1.018–3.838). The adjusted multivariable model adequately fit the data (generalised Hosmer–Lemeshow goodness-of-fit test statistic = 17.32, *df* = 16, *p* = 0.365).

Outcome-Related Indicator

A total of eight indicator dimensions focusing on ORIs were identified of which only five emerged as statistically significant. The dimensions that were statistically significant in the study area were reduction of the number of diseases, reduction of the number of disabilities and reduced health inequities. Others are improved needs assessments and improved community participation and mobilisation (Table 7).

Further analysis at the facility levels showed that three indicator dimensions: reduction in the number of diseases, reduction in the number of disabilities and improved need assessment were associated with HCWs at the tertiary healthcare level. However, no indicator dimensions were associated with HCWs at both the primary and secondary healthcare levels (Table 8).

Five dimensions were identified in the unadjusted and adjusted models for medical doctors (Table 9). The significant dimensions for medical doctors include reduction in the number of diseases (coeff: 3.151, 95% CI: 1.643–6.041), reduction in the number of injuries (coeff: 0.412, 95% CI: 0.191–0.886), reduction in the number of disabilities (coeff: 4.497, 95% CI 2.084–9.705), reduced health inequities (coeff: 0.424, 95% CI 0.215–0.835) and improved need assessments (coeff: 0.319, 95% CI 0.164–0.620). Among AHW, two predictors each were significant for the unadjusted and adjusted models, respectively, and include reduction in the number of disabilities (coeff: 3.522, 95% CI:

TABLE 3: Facility-related indicators' dimension associated with health promotion in a multivariate analysis.

FRI dimensions	Professions	Coeff (unadjusted)	95% CI	Coeff (adjusted)	95% CI
HP budget	Nurses (base outcome)	-	-	-	-
	Doctors	0.293	-0.364–0.950	0.163	-0.422–0.747
	Allied workers	-0.805	-1.524 – -0.086	-0.726	-1.361 – -0.091
HP data available for evaluation	Nurses (base outcome)	-	-	-	-
	Doctors	0.886	0.235–1.537	0.988	0.369–1.608
	Allied workers	1.113	0.205–2.022	0.954	0.149–1.759
HP structures and facilities required	Nurses (base outcome)	-	-	-	-
	Doctors	0.944	0.122–1.765	0.563	-0.179–1.305
	Allied workers	1.742	0.404–3.081	1.787	0.488–3.087
Quality assessment programme	Nurses (base outcome)	-	-	-	-
	Doctors	0.642	0.001–1.283	0.787	0.208–1.366
	Allied workers	0.513	-0.248–1.274	0.573	-0.143–1.289
Provisions to access HP need	Nurses (base outcome)	-	-	-	-
	Doctors	-2.888	-4.244 – -1.532	-2.695	-3.942 – -1.448
	Allied workers	-1.814	-3.566–0.063	-1.798	-3.428 – -0.167
HP need assessment done at first contact with the hospital	Nurses (base outcome)	-	-	-	-
	Doctors	-0.675	-1.409–0.060	-0.751	-1.444 – -0.057
	Allied workers	-0.814	-1.766–0.133	-0.789	-1.679–0.099

FRI, facility-related indicators; CI, confidence interval; HP, health promotion; Coeff, coefficient.

TABLE 4: Associations between healthcare workers and healthcare workers-related indicators' dimensions.

HRI dimensions	Responses	Healthcare workers						<i>p</i>
		Doctors		Nurses		AHW		
		<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	
Education on disease condition	Strongly disagree	1	0.21	3	0.62	2	0.41	0.004
	Disagree	6	1.24	2	0.41	0	0.00	
	Neutral	13	2.68	6	1.24	3	0.62	
	Agree	86	17.73	73	15.05	22	4.54	
	Strongly disagree	85	17.53	141	29.07	42	8.66	
Guidance on diet and lifestyle	Strongly disagree	2	0.41	3	0.62	1	0.21	0.000
	Disagree	15	3.10	1	0.21	1	0.21	
	Neutral	35	7.23	7	1.45	8	1.65	
	Agree	91	18.80	72	14.88	26	5.37	
	Strongly disagree	48	9.92	142	29.34	32	6.61	
Need for routine check-up	Strongly disagree	3	0.62	4	0.83	6	1.25	0.000
	Disagree	8	1.66	5	1.04	0	0.00	
	Neutral	20	4.16	7	1.46	12	2.50	
	Agree	99	20.58	68	14.14	24	4.99	
	Strongly disagree	60	12.47	138	28.69	27	5.61	
Adequate knowledge on patient condition	Strongly disagree	2	0.41	12	2.46	4	0.82	0.000
	Disagree	7	1.44	12	2.46	7	1.44	
	Neutral	19	3.90	15	3.08	9	1.85	
	Agree	125	25.67	103	21.15	29	5.96	
	Strongly disagree	38	7.80	85	17.45	20	4.11	
Fitness and health screening	Strongly disagree	5	1.02	0	0.00	1	0.21	0.000
	Disagree	28	5.74	4	0.82	3	0.62	
	Neutral	50	10.25	19	3.89	21	4.30	
	Agree	90	18.44	129	26.43	34	6.97	
	Strongly disagree	18	3.69	76	15.57	10	2.05	
Assist with welfare services	Strongly disagree	14	2.88	10	2.06	5	1.03	0.347
	Disagree	29	5.97	35	7.20	7	1.44	
	Neutral	50	10.29	46	8.23	19	3.91	
	Agree	78	16.05	99	20.37	25	5.14	
	Strongly disagree	20	4.12	36	7.41	13	2.68	
Participated in HP training	No	123	25.47	127	26.29	31	6.42	0.021
	Yes	65	13.46	91	18.84	36	7.45	
Coordinated HP training for staff	No	172	36.21	133	28.00	54	11.39	0.000
	Yes	17	3.58	84	17.68	15	3.16	
Home visit	No	184	38.33	177	36.88	53	11.04	0.000
	Yes	5	1.04	46	9.58	15	3.13	
Community-based placements	No	185	38.78	194	40.67	52	10.90	0.000
	Yes	4	0.84	27	5.66	15	3.15	
Follow-up post discharge	No	71	14.92	120	25.21	15	3.15	0.000
	Yes	117	24.58	100	21.01	53	11.13	
Patient empowerment	No	176	36.90	199	41.72	60	12.58	0.216
	Yes	12	2.52	21	4.40	9	1.89	
Informs patient of risk factors	No	166	34.95	198	41.68	61	12.82	0.989
	Yes	6	1.26	9	1.90	2	0.42	
	I don't know	13	2.74	15	3.16	5	1.05	

HRI, health worker-related indicators; AHW, allied health workers; HP, health promotion.

1.333–9.304) and reduced health inequities (coeff: 0.181, 95% CI: 0.063–0.524). The generalised Hosmer–Lemeshow test chi-square was 8.47 with a *p*-value of 0.933, indicating a good fit of the final model.

Overall, we identified three indicator categories that may be used for measuring HP performance of HCWs: (1) FRIs, (2) HRIs and (3) ORIs. Association between dimensions and HCWs identified significant FRI dimensions, including HP budget, HP communication channel, coordination, and policy and guidelines. Some of the emerging HRI

dimensions included guidance on diet and lifestyle, adequate knowledge on patient condition, follow-up and home visits, and ORI dimensions such as reductions in diseases and disabilities, health inequities and improved need assessment. Exploration of relationships between dimensions and various levels of health facilities revealed correlations between HCWs with policy and guidelines at the primary healthcare level. The results further showed an association between HCWs and CBP at the primary level, and HCWs with CBP, home visits and follow-up at the secondary level.

TABLE 5: Health workers-related indicator dimensions at different levels of healthcare.

HRI dimensions	Responses			Primary healthcare level						Secondary healthcare level						Tertiary healthcare level							
				Doctors		Nurses		AHWs		Doctors		Nurses		AHWs		Doctors		Nurses		AHWs		p	
	n	%		n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	p	
Educate on disease condition	Strongly disagree	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.190*	1	0.29	3	0.88	2	0.59	0.052
	Disagree	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	1	5.88	0	0.00	0	0.00	6	1.76	1	0.29	0	0.00
	Neutral	0	0.00	2	1.57	0	0.00	0	0.00	0	0.00	0	0.00	1	5.88	0	0.00	13	3.81	4	1.17	2	0.59
Agree	Agree	0	0.00	35	27.56	0	0.00	4	23.53	1	5.88	1	5.88	1	5.88	0	0.00	82	24.05	37	10.85	21	6.16
	Strongly agree	7	5.51	75	59.06	8	6.30	3	17.65	1	5.88	1	5.88	5	29.41	75	21.99	65	19.06	29	8.50	6	1.76
	Strongly disagree	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.356*	2	0.59	3	0.88	1	0.29	0.000
Guidance on diet and lifestyle	Disagree	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	15	4.41	1	0.29	1	0.29
	Neutral	0	0.00	0	0.00	0	0.00	1	5.88	0	0.00	2	11.76	0	0.00	2	11.76	34	10.00	7	2.05	6	1.76
	Agree	2	1.57	40	31.50	1	0.79	5	29.41	1	5.88	2	11.76	2	11.76	84	24.71	31	9.12	31	9.12	23	6.77
Strongly agree	Strongly agree	5	3.94	72	56.69	7	5.51	0.389	1	5.88	2	11.76	3	17.65	3	17.65	42	12.35	68	20.00	22	6.47	6.47
	Strongly disagree	0	0.00	1	0.79	1	0.79	0.426	0	0.00	0	0.00	0	0.00	0	0.00	0.505	3	0.89	3	0.89	5	1.48
	Disagree	0	0.00	1	0.79	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	8	2.37	4	1.18	0	0.00
Need for routine check-up	Neutral	0	0.00	1	0.79	0	0.00	0	0.00	2	11.76	0	0.00	0	0.00	0	0.00	18	5.33	6	1.78	12	3.55
	Agree	1	0.79	37	29.37	2	1.59	2	11.76	1	5.88	3	17.65	3	17.65	96	28.40	30	8.88	19	5.62	5.62	
	Strongly agree	6	4.76	71	56.35	5	3.97	3	17.65	2	11.76	2	11.76	4	23.53	51	15.09	65	19.23	18	5.32	18	5.32
Adequate knowledge on patient condition	Strongly disagree	0	0.00	6	4.65	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.120*	2	0.59	6	1.76	4	1.17	0.003
	Disagree	0	0.00	5	3.88	0	0.00	0	0.00	0	0.00	0	0.00	2	11.76	0	0.00	7	2.05	7	2.05	5	1.47
	Neutral	0	0.00	6	4.65	1	0.78	0	0.00	0	0.00	0	0.00	2	11.76	0	0.00	19	5.57	9	2.64	6	1.76
Fitness and health screening	Agree	4	3.10	52	40.31	4	3.10	7	41.18	3	17.65	2	11.76	2	11.76	114	33.43	48	14.08	23	6.74	6.74	
	Strongly agree	3	2.33	45	34.88	3	2.33	0	0.00	0	0.00	0	0.00	1	5.88	35	10.26	40	11.73	16	4.69	4.69	
	Strongly disagree	0	0.00	0	0.00	0	0.00	0.727	0	0.00	0	0.00	0	0.00	0	0.00	0.213	5	1.46	0	0.00	1	0.29
Assist with welfare services	Disagree	0	0.00	0	0.00	0	0.00	2	11.76	1	5.88	1	5.88	0	0.00	0	0.00	26	7.60	3	0.88	3	0.88
	Neutral	0	0.00	10	7.75	0	0.00	0	0.00	0	0.00	1	5.88	0	0.00	0	0.00	50	14.62	8	2.34	21	6.14
	Agree	5	3.88	66	51.16	6	4.65	4	23.53	1	5.88	5	29.41	81	23.68	62	18.13	23	6.73	23	6.73	6.73	
Participated in HP training	Strongly agree	2	1.55	38	29.46	2	1.55	1	5.88	0	0.00	2	11.76	2	11.76	15	4.39	38	11.11	6	1.75	1.75	
	Strongly disagree	0	0.00	5	3.88	0	0.00	0.827	0	0.00	0	0.00	0	0.00	0	0.00	0.687*	14	4.18	5	1.47	5	1.47
	Disagree	1	0.78	14	10.85	0	0.00	0	0.00	1	5.88	1	5.88	1	5.88	27	7.94	20	5.88	7	2.06	2.06	
Coordinated HP training for staff	Neutral	3	2.33	26	20.16	3	2.33	1	5.88	1	5.88	1	5.88	1	5.88	46	13.53	19	5.59	15	4.41	4.41	
	Agree	3	2.33	53	41.09	4	3.10	3	17.65	1	5.88	3	17.65	3	17.65	72	21.18	45	13.24	18	5.29	5.29	
	Strongly agree	0	0.00	16	12.40	1	0.78	2	11.76	0	0.00	0	0.00	3	17.65	1	5.29	20	5.88	9	2.65	2.65	
Home visits	No	4	3.20	56	44.80	6	4.80	0.408	5	29.41	2	12.50	5	29.41	114	34.34	69	20.78	20	6.02	20	6.02	0.001
	Yes	3	2.40	54	43.20	2	1.60	1	5.88	1	5.88	1	5.88	2	12.50	61	18.37	36	10.84	32	9.64	9.64	
	Strongly agree	4	3.20	65	52.00	5	4.00	0.976	6	37.50	1	6.25	5	31.25	162	48.50	67	20.06	44	13.17	44	13.17	0.000
Community-based placements	No	7	5.56	74	58.73	4	3.75	0.104	6	37.50	3	18.75	3	18.75	171	50.59	100	29.59	46	13.61	46	13.61	0.013
	Yes	0	0.00	37	29.37	4	3.75	0	0.00	0	0.00	4	25.00	5	1.48	9	2.66	7	2.07	7	2.07	2.07	
	Strongly agree	7	5.65	88	70.97	3	2.42	0.006	6	37.50	3	18.75	3	18.75	172	51.04	103	30.56	46	13.65	46	13.65	0.020
Patient empowerment	No	0	0.00	21	16.94	5	4.03	0	0.00	0	0.00	4	25.00	4	25.00	69	20.35	80	23.60	15	4.42	4.42	
	Yes	2	1.65	37	30.58	0	0.00	0.162	0	0.00	3	18.75	3	18.75	106	31.27	30	8.85	39	11.50	39	11.50	0.000
	Strongly agree	5	4.13	70	57.85	7	5.79	6	37.50	0	0.00	7	43.75	106	31.27	106	31.27	30	8.85	39	11.50	11.50	
Informs patient of risk factors	No	7	5.60	95	76.00	6	4.80	0.370	6	37.50	3	18.75	5	31.25	163	48.51	101	30.06	49	14.58	49	14.58	0.687
	Yes	0	0.00	15	12.00	2	1.60	0	0.00	0	0.00	2	12.50	2	12.50	12	3.57	6	1.79	5	1.49	1.49	
	Strongly agree	6	4.80	99	79.20	8	6.40	0.592	5	31.25	3	18.75	7	43.75	155	46.41	96	28.74	46	13.77	46	13.77	0.175
I don't know	No	0	0.00	0	0.00	0	0.00	0	0.00	1	6.25	0	0.00	0	0.00	5	1.50	9	2.69	2	0.60	0.60	
	Yes	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	12	3.59	4	1.50	5	1.50	1.50	
	Strongly agree	1	0.80	11	8.80	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	12	3.59	4	1.50	5	1.50	1.50	

*. Some cells have frequencies equal to or less than 5. HRI, health worker-related indicators; AHWs, allied health workers; HP, health promotion.

TABLE 6: Healthcare workers-related indicators' dimensions associated with health promotion in a multivariate analysis.

Dimensions	Professions	Coeff (unadjusted)		Coeff (adjusted)	
		95% CI	95% CI	95% CI	95% CI
Education on disease condition	Nurses (base outcome)	-	-	-	-
	Doctors	2.270	1 358–3.796	2.273	1 393–3.710
	Allied HW	2.291	1.176–4.462	2.117	1.107–4.048
Guidance on diet and lifestyle	Nurses (base outcome)	-	-	-	-
	Doctors	0.347	0 216–0.559	0.361	0 228–0.570
	Allied HW	0.581	0 318–1.062	0.640	0 356–1.153
Need for a routine check-up	Nurses (base outcome)	-	-	-	-
	Doctors	0.990	0.670–1.464	1.048	0.717–1.532
	Allied HW	0.560	0 383–0.821	0.564	0 389–0.818
Fitness and health screening	Nurses (base outcome)	-	-	-	-
	Doctors	0.304	0 204–0.453	0.325	0 224–0.474
	Allied HW	0.463	0 291–0.732	0.448	0 291–0.689
Participated in HP training	Nurses (base outcome)	-	-	-	-
	Doctors	1.109	0.634–1.942	1.130	0.653–1.955
	Allied HW	2.099	1 073–4.108	1.977	1 018–3.838
Coordinated HP training for staff	Nurses (base outcome)	-	-	-	-
	Doctors	0.193	0 092–0.406	0.216	0.106–0.441
	Allied HW	0.273	0.116–0.640	0.318	0.140–0.721
Home visits	Nurses (base outcome)	-	-	-	-
	Doctors	0.114	0 030–0.429	0.141	0 039–0.501
	Allied HW	0.296	0 086–1.023	0.404	0.128–1.275
Community-based placements	Nurses (base outcome)	-	-	-	-
	Doctors	0.472	0.104–2.134	0.399	0 090–1.772
	Allied HW	4.848	1.343–17 502	3.914	1.147–13.351
Follow-up post-discharge	Nurses (base outcome)	-	-	-	-
	Doctors	2.513	1.458–4.331	2.743	1.618–4.648
	Allied HW	5.154	2.354–11 287	5.005	2.350–10.660
Patient empowerment	Nurses (base outcome)	-	-	-	-
	Doctors	4.811	1.294–17 886	3.919	1.102–13.931
	Allied HW	1.007	0 295–3.442	0.829	0 247–2.777

CI, confidence interval; HW, health workers; HP, health promotion; Coeff, coefficient.

Discussion

The indicators explored in the current study are selected measures or dimensions pointing to adequacy or inadequacy of HP quality. Most respondents in this study reported an absence or ignorance of both communication channels and HP coordination in their facilities. The absence of these dimensions could affect the optimal functioning of HP within the healthcare system. While the literature search did not show previous studies on indicators for measuring HP practice of HCWs, to which the current study could be directly compared, poor communication among HCWs could result in several adverse outcomes. Such outcomes include a compromise on patient safety as well as patients' displeasure and ineffective use of valuable resources.²² Lack of HP practice coordination elicited in this study further highlights the bigger issue of poor coordination in contemporary healthcare systems that constitute a major risk to quality and safety. There is now an increasing consciousness that

TABLE 7: Association between healthcare workers and outcome-related indicator dimensions.

ORI dimensions	Responses	Healthcare workers						p
		Doctors		Nurses		AHW		
		n	%	n	%	n	%	
Coverage of target population	No	68	23.05	80	27.12	26	8.81	0.120
	Yes	35	11.86	70	23.73	16	5.42	
Reduction in the number of deaths	No	43	14.33	75	25.00	25	8.33	0.138
	Yes	62	20.67	77	25.67	18	6.00	
Reduction in the number of diseases	No	32	10.70	74	24.75	25	8.36	0.002
	Yes	72	24.08	78	26.09	18	6.02	
Reduction in the number of injuries	No	66	22.07	93	31.11	31	10.37	0.423
	Yes	38	12.71	59	19.73	12	4.01	
Reduction in the number of disabilities	No	59	19.73	113	37.80	30	10.03	0.012
	Yes	45	15.05	39	13.04	13	4.35	
Reduce health inequities	No	74	24.75	92	30.77	37	12.38	0.005
	Yes	30	10.03	60	20.07	6	2.01	
Improved need assessments	No	84	28.19	89	29.66	29	9.73	0.001
	Yes	20	6.71	62	20.80	14	4.70	
Improved community participation and mobilisation	No	78	28.00	92	30.70	24	8.00	0.036
	Yes	27	9.00	61	20.30	18	6.00	

ORI, outcome-related indicators; AHW, allied health workers.

high quality of health care is not a function of individual HCW's professional brilliance but on ensuring that all components necessary to meet the patient's need such as professional expertise, resources, information and technology are well aligned.²³

The budget was another significant FRI dimension identified in this study. In South Africa, the public health system is funded mostly through the general tax revenue to provide universal coverage to all citizens. The study results revealed that participants emphasised the importance of financial allocation through adequate HP budgets. However, most of the respondents reported an absence or unawareness of any financial budget for HP activities in the study area. Furthermore, the health system that is mostly dependent on general tax revenue has also been affected by severe austerity measures and resource (especially financial) mismanagement leading to ineffective functioning of public hospitals. This may also affect the implementation of HP policies, thus having long-term implications on disease prevention and HP outcomes. The financial budget is an all-important driver of health at all levels of care.^{24,25,26} This unfavourable response on HP budget may imply a possible lack of a structural plan for HP at the policy level or a lack of understanding of the potentially accruable benefits from HP.

This study further highlighted low involvement in HP induction training by medical doctors and AHW when compared with the nurses. The observed low or absence of HP induction training reported by the HCWs may translate to poor HP knowledge by HCWs, hence, inadequate HP practices. Furthermore, previous studies reported significant improvement in confidence, knowledge and attitude of employers and employees following a workplace HP training programme.²⁷ Healthcare workers' poor participation in HP training or unawareness of its existence in their facilities may

TABLE 8: Outcome-related indicator dimensions at different levels of health care.

ORI dimensions	Responses																							
	Primary healthcare level				Secondary healthcare level				Tertiary healthcare level															
	Doctors	Nurses	AHWs	p	Doctors	Nurses	AHWs	p	Doctors	Nurses	AHWs	p												
n	%	n	%	n	%	n	%	n	%	n	%	n	%											
Coverage of target population	No	4	3.96	34	33.66	4	3.96	0.171	1	11.11	2	22.22	2	22.22	2	22.22	0.325*	63	34.05	44	23.78	20	10.81	0.440
	Yes	2	1.98	55	54.55	2	1.98		2	22.22	0	0.00	2	22.22	0	0.00		31	16.76	15	8.11	12	6.49	
Reduction in the number of deaths	No	5	4.95	49	48.51	3	29.70	0.380	0	0.00	1	11.11	2	22.22	0.325*	38	20.00	25	13.16	20	10.53	0.096		
	Yes	1	0.99	40	39.60	3	29.70		3	33.33	1	11.11	2	22.22		58	30.53	36	18.95	13	6.84			
Reduction in the number of diseases	No	3	29.70	42	41.58	3	29.70	0.983	0	0.00	1	11.11	3	33.33	0.140*	29	15.34	31	16.40	19	10.05	0.006		
	Yes	3	29.70	47	46.53	3	29.70		3	33.33	1	11.11	1	11.11		66	34.92	30	15.87	14	7.41			
Reduction in the number of injuries	No	5	4.95	60	59.41	4	3.96	0.717	1	11.11	1	11.11	3	33.33	0.539*	60	31.74	32	16.93	24	12.70	0.138		
	Yes	1	0.99	29	28.71	2	1.98		2	22.22	1	11.11	1	11.11		35	18.52	29	15.34	9	4.76			
Reduction in the number of disabilities	No	4	3.96	63	62.38	2	1.98	0.161	1	11.11	2	22.22	4	44.44	0.076*	54	28.57	48	25.40	24	12.70	0.013		
	Yes	2	1.98	26	25.74	4	3.96		2	22.22	0	0.00	0	0.00		41	21.69	13	6.88	9	4.76			
Reduced health inequities	No	3	29.70	51	50.50	5	4.95	0.416	1	11.11	2	22.22	4	44.44	0.076*	70	37.04	39	20.63	28	14.81	0.089		
	Yes	3	29.70	38	37.62	1	0.99		2	22.22	0	0.00	0	0.00		25	13.23	22	11.64	5	2.65			
Improved need assessments	No	4	4.00	51	51.0	5	5.00	0.444	2	22.22	0	0.00	3	33.33	0.196*	78	41.27	38	20.11	21	11.11	0.012		
	Yes	2	2.00	37	37.00	1	1.00		1	11.11	2	22.22	1	11.11		17	8.99	23	12.17	12	6.35			
Improved community participation and mobilisation	No	5	4.95	43	42.57	2	1.98	0.180	1	11.11	2	22.22	4	44.44	0.076*	71	37.76	46	24.47	18	9.57	0.099		
	Yes	1	0.99	46	45.54	4	3.96		2	22.22	0	0.00	0	0.00		24	12.76	15	7.98	14	7.44			

*, Some cells have frequencies equal to or less than 5.

ORI, outcome-related indicators; AHW, allied health workers.

suggest inadequate awareness of HP programmes in the study area. This compares well with findings from a previous study that showed poor HP awareness among HCWs in the facilities.²⁸ However, regarding educating patients on their disease condition, all HCWs fared well in this dimension. This may be because most information communicated to patients in this dimension focuses on biomedical evidence that forms part of the core professional training and not necessarily on HP. Most of the medical doctors and AHW reported an absence or ignorance of HP guidelines and policy in their facilities. The observed poor participation in HP practices among HCWs in the study area may be because of a lack of or inadequate HP guidelines and policies. A recent study observed that poor knowledge of HP policies among most HCWs may contribute to poor HP practice among HCWs.²⁹ This emphasises the need for HCWs to have standardised guidelines, policy and programme appraisal to ensure efficient HP practices by HCWs at all levels.

The study findings further showed that HCWs' responses regarding home visits to promote patients' health were poor. A previous study showed that most physicians indicated that home care should be provided to bedridden patients, incapacitated or patients lacking family support.³⁰ According to these authors, the physicians who participated in the study showed dissatisfaction concerning abuse of services (when patients demand home services for undeserving conditions), suggesting the need for defined guidelines and policies to protect the interest of both patients and HCWs. Our findings corroborate with a study carried out in Canada, which showed a very good rate of patients' follow-up post-discharge.³¹ However, the Canadian study reported a higher rate of follow-up of patients from bigger urban settings compared with those from rural areas. The variations observed between home visits and follow-up (Table 4) in this study may suggest that most patients make a conscious effort to come back to the hospital, and when they do, they must be attended to. The problem with this is that several patients may be unable to come back to the hospital because of cost, poor health, or other reasons, and are therefore excluded from HP care and empowerment. This undermines the goal of Universal Health Care (UHC). For the agenda of UHC to be achieved, there must be a shift from the status quo that focuses only on patients visiting the health care facilities to HCWs visiting patients.³²

Furthermore, reduction in disease and disability were identified as HP outcome measures in the current study. This compares well with a previous study in which Maredza et al.³³ showed that the best approach to reduce the burden of stroke is through HP. Reduction in health inequity also emerged as a dimension in measuring HP outcomes, and this may be traceable to the historical apartheid background of South Africa that demarcated people along racial lines. The socio-economic impact of this systemic divide is still evident in the South African healthcare system³⁴ as the quality of care differs along socioeconomic strata.

To our knowledge, this is the first study to identify HP indicators among HCWs in the study area, and this is the first

TABLE 9: Outcome-related indicators' dimension associated with health promotion in a multivariate analysis.

ORI dimensions	Professions	Coeff (unadjusted)	95% CI	Coeff (adjusted)	95% CI
Reduction in the number of diseases	Nurses (base outcome)	-	-	-	-
	Doctors	2 869	1.466–5.615	3.151	1.643–6.041
	Allied HW	1.135	0.469–2.745	1.014	0.439–2.344
Reduction in the number of injuries	Nurses (base outcome)	-	-	-	-
	Doctors	0 391	0.177–0.866	0.412	0.191–0.886
	Allied HW	0 520	0.185–1.461	0.535	0.199–1.434
Reduction in the number of disabilities	Nurses (base outcome)	-	-	-	-
	Doctors	4 829	2.198–10.612	4.497	2 084–9.705
	Allied HW	3 554	1.297–9.739	3.522	1 333–9.304
Reduced health inequities	Nurses (base outcome)	-	-	-	-
	Doctors	0.488	0.246–0.969	0.424	0 215–0.835
	Allied HW	0.145	0.046–0.464	0.181	0 063–0.524
Improved needs assessments	Nurses (base outcome)	-	-	-	-
	Doctors	0 378	0.189–0.756	0.319	0.164–0.620
	Allied HW	1 019	0.451–2.305	0.986	0.454–2.140

ORI, outcome-related indicators; CI, confidence interval; HW, health workers; Coeff, coefficient.

time a comparison of HP indicators among HCWs has been made among different healthcare professionals and at various levels of health facilities.

As this study focused on HCWs in one municipality, the results may not be directly extrapolated to all other municipalities in the country. Further study recommendations include (1) studies involving HCWs from other South African municipalities and (2) studies exploring the impact of HP-related training in changing HCWs' attitudes and practice of HP.

Conclusion

This study has identified indicator dimensions reported by HCWs for measuring HP practices among them. Broadly classified as FRI, HRI and ORI, the indicator dimensions in this study were not imported and imposed on HCWs. The relevance of the individual dimensions is that it provides a template for the HP potentials among HCWs to be maximally harnessed in the Nelson Mandela Bay Municipality. As HCWs within health facilities and communities have a lasting impact on influencing patients and their relatives' behaviour, this study strives to make a case for HP in healthcare facilities.

We, however, note that the pathway to institutionalising measuring indicators may be a long one considering the rigors required of government to address manpower needs, deliberations, setting benchmarks and defining expected goals for HCWs. This study is, therefore, a contribution towards the initiation of that change process.

Acknowledgements

The authors acknowledge the healthcare workers who participated in this study.

Competing interests

The authors declare that they have no financial or personal relationships that may have inappropriately influenced them in writing this article.

Authors' contributions

H.I.M., C.K. and M.J.C. contributed to the writing of this manuscript.

Funding information

This study was supported by funding from the College of Health Sciences, University of KwaZulu-Natal.

Data availability

Data sets for this study are with the corresponding author, H.I.M., and will be made available upon request.

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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Chapter two presented the indicators for health promotion measurement. Although there is no consensus regarding what constitutes performance measurement for health promotion practice among healthcare workers in the Nelson Mandela Bay Municipality, several indicators were considered important. The identified indicators were broadly classified as – facility related indicators (FRI), health worker related indicators (HRI) and outcome related indicators (ORI). Similar classification may be adopted for use in other areas. In chapter three, enablers and hindrances to health promotion and disease prevention practices among healthcare workers were analyzed at the various healthcare facility levels to address research questions/objectives 2 and part of 4.

Chapter 3

Enablers and hindrances to health promotion and disease prevention practices among healthcare workers in Nelson Mandela Bay Municipality, South Africa

Melariri HI, Kalinda C, Chimbari MJ. Enablers and hindrances to health promotion and disease prevention practices among healthcare workers in Nelson Mandela Bay Municipality, South Africa. Preventive Medicine Reports 2021; 23:101462 <https://doi.org/10.1016/j.pmedr.2021.101462>



Enablers and hindrances to health promotion and disease prevention practices among healthcare workers in Nelson Mandela Bay Municipality, South Africa

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ARTICLE INFO

Keywords:

Enablers
Hindrances
Healthcare workers
Health promotion
Disease prevention

ABSTRACT

Health promotion (HP) and disease prevention (DP) practices among healthcare workers (HCWs) are key to achieving universal health coverage. This study identified HP and DP enablers and hindrances and compared them at different healthcare levels in Nelson Mandela Bay Municipality, South Africa.

An exploratory cross-sectional study using a structured questionnaire was conducted among HCWs (n = 501) from 23 hospitals. Bivariate and multinomial regression were used to analyze the data. The highest number of participants (70.46%; n = 353) were from tertiary hospitals. Thirteen and Eight categories of enablers and hindrances respectively were identified. Of these, eleven enablers and six hindrances of HP and DP were associated with tertiary hospitals; no enabler was identified at both primary and secondary while one hindrance was associated with primary level of health care. Collaboration among disciplines and organizations (Coeff: 2.16, 95% CI: 1.28–3.66) and programme planning (Coeff: 0.375, 95% CI: 0.23–0.62) were the predictors of HP and DP among medical doctors, while staff induction training (Coeff: 0.62, 95% CI: 0.40–0.95) and performance appraisal (Coeff: 1.86, 95% CI: 1.16–2.98) were the enablers among allied health workers. On the other hand, 'facility promoting treatment more than prevention' (Coeff: 2.03, 95% CI: 1.30–3.14) and 'practice guidelines incorporating HP' (Coeff: 2.79, 95% CI: 1.66–4.70) were the predictors of HP and DP hindrances among medical doctors and allied health workers respectively. Our work indicates the need for an operational strategy designed considering enabling and hindering factors to HP and DP practices for empowering HCWs and enhancing health outcomes.

1. Introduction

Health promotion and disease promotion have been highly profiled in global health discussions in the past three decades. Health promotion is the process of enabling people to increase control over, and to improve their health (WHO, 1998) while in a complementary manner, disease prevention is aimed at preventing the occurrence of disease by reducing risk factors, stopping disease progression and mitigating its consequences if established (WHO, 1998). In the past five decades, there has been significant progress in healthcare as a result of advances in diagnostics and treatment of many diseases (McClellan et al., 2019). Despite this progress, morbidity and mortality from high burden of preventable diseases persist (Galea and Maani, 2020). Recently, Bolnick

et al. (2020) reported that the United States spent an estimated US \$730.4 billion on preventable diseases in 2016. According to the International Monetary Fund (IMF), this amount translates to greater than the Gross Domestic product (GDP) of more than 171 countries for the year 2019 (International Monetary Fund, 2019). The continued existence of these preventable disease conditions and eventual loss of lives should be a concern not only to healthcare workers but to those in positions of decision making regarding populations (Galea and Maani, 2020). The United Nations identified Universal Health coverage (UHC), as the focus of Sustainable Development Goals (SDG) target 3.8 (UN Inter-Agency & Expert Group on SDG Indicators, 2016). To achieve this goal, the World Health Organization emphasized the importance of Health promotion and disease prevention (WHO, 2020), with HCWs as

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<https://doi.org/10.1016/j.pmedr.2021.101462>

Received 10 January 2021; Received in revised form 16 May 2021; Accepted 17 June 2021

Available online 22 June 2021

2211-3355/© 2021 The Author(s).

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key players to its actualization (Patel et al., 2018).

In Ethiopia, factors resulting in late diagnosis of breast cancer, which otherwise is curable, included health system related, individual and cultural (Id et al., 2019). In Brazil, a mortality rate of 20% was reported among 80 patients investigated for visceral leishmaniasis (Driemeier et al., 2015); the cause of death was attributed to delay in diagnosis (Driemeier et al., 2015). In a study to investigate the factors responsible for late diagnosis and treatment of cancer patients, Okten et al. (2018) showed that screening rate was higher among women than for men. Okten et al, highlighted patients' ignorance as being responsible for much (52.2%) of the delay. In addition to these, pandemics like COVID-19 continue to constrain both the health system and HCWs (Armocida et al., 2020; Muller et al., 2020).

According to Galea and Maani (2020), preventable illnesses and death, regardless of the amount is not tolerable. To achieve this, new orientation of disease prevention and population wellbeing will require a shift from the current practice in which HCWs focus mainly on their traditional roles of diagnosis and treatment of illnesses. This anticipated transition will be achieved through HCWs who are in regular contact with patients (Giannis et al., 2020) from diverse backgrounds. Health Care Workers understand the sociocultural characteristics of patients (Brooks et al., 2019), and are able to combine this with their training to effectively provide HP and DP services that extends to patients' families and communities.

Enablers and hindrances are healthcare determinants that may enhance or hinder HP and DP practices. Hindrances can be found at several levels, hence undertaking a thorough investigation into the enablers and hindrances to HCWs HP practice will yield informed intervention approach. Baker et al in their Cochrane review, underlined the strategies for identifying barriers to include observation, focus group, survey of HCWs, and analysis of care provision institutions among others (Baker et al., 2010). The study of Baker et al forms part of evidence-based practice for identifying hindrances. Evidence based HP practice has continually been advanced. The importance of culture, sustained dialogue, capacity and communication at all levels in HP practice have been highlighted (Juneau et al., 2011). Enhancing evidence-based practice by HCWs demands modifying operational behavior, not only of the individual HCW, but also at several stakeholder levels. The overburdened South African health system (Maphumulo and Bhengu, 2019; Mbunge, 2020), similar to those of many low and middle income countries (LIMC) (Bong et al., 2020; Hamid et al., 2020; Hogan et al., 2020), require maintenance of prevention activities (Hogan et al., 2020) as well as HP strengthening (Van den Broucke, 2020).

With a population of 1 271 776 (Nelson Mandela Bay Municipality, 2017), the Nelson Mandela Bay Municipality (NMBM) forms part of South Africa's eight metropolitan municipalities and a key role player in the Eastern Cape province economy. The municipality is comprised of many peri-urban settlements and has an unemployment rate of 40.4% (Kimberley et al., 2020). Only 21.7% of NMBM's population are members of a medical aid scheme (STATS SA, 2018). The rest of the population are catered for by the overstretched public health system. The municipality was an epicentre of COVID-19 during the second wave of the pandemic in 2020 and health promotion services was described as the "unheard" voice (Eastern Cape DoH and NICD, 2020).

The concept of advancing life is engrained in the wider context of health, giving impetus to HCWs positively changing lives of the population they serve not only through clinical services, but also by enabling them lead full productive lives. This can be achieved through making people see health as a means to an end (Sathegke et al., 2016). In the 2016/17 year, the NMBM reduced its health expenditure by 12.9% despite high funding (Massyn et al., 2019). The 2019 District Health Barometer (DHB) (Massyn et al., 2019) reported the NMBM as achieving only a 19.1% screening coverage in the 2017/18 grade 1 integrated School Health programme (ISHP), and a 57.7% in the under one year immunization coverage, this being one of the lowest. Furthermore, the NMBM recorded a greater than 10% tuberculosis (TB) loss to follow-up

(Massyn et al., 2019). The South African Medical Research Council (SAMRC) further reported concerns with adherence to antiretroviral therapy in the NMBM (Sathegke et al., 2016).

Despite existing universal literature, there is no evidence on what constitutes enablers and hindrances to HP and DP practice among HCWs in the Nelson Mandela Bay Municipality. We therefore conducted this study to determine the enablers and hindrances associated with HCWs' practice of HP and DP; and compared them across the different levels of healthcare facilities in the NMBM of South Africa. An understanding of these enablers and hindrances is essential for improving HP and DP practice.

2. Methodology

2.1. Setting, design and sample

The study was conducted in the Nelson Mandela Bay Municipality (NMBM) located in the Eastern Cape (EC) Province of South Africa. The Health district of Nelson Mandela Bay covers a surface area of about 2000 square kilometres. The Municipality's public healthcare facilities include primary, secondary, and tertiary healthcare institutions. In addition, the Municipality has four private hospitals (Corporative Governance and Traditional affairs, 2020).

An exploratory cross-sectional study using a structured questionnaire was conducted between January 2020 and March 2020. The questionnaire was adapted from previous peer reviewed literature including the WHO publication on: Implementing health promotion in hospitals: Manual and self-assessment forms (Groene, 2006). The research instrument was pre-tested with participants that were not included in the main study and who were unlikely to influence study participants. Based on the pre-test, content validity and reliability were confirmed. The study population was constituted of exclusively HCWs in the NMBM.

A total of 520 HCWs comprising medical doctors, nurses, and allied health workers (physiotherapists, speech therapists, social workers, dieticians, and occupational therapists) were randomly sampled from 23 public healthcare facilities in the municipality. An estimated 3500 HCWs serve the NMBM public healthcare system. The 23 healthcare facilities comprise of 19 primary level hospitals, 1 secondary level hospital, and 3 tertiary level hospitals. Of the 520 administered questionnaires, 19 ineligible questionnaires were eliminated. Of the remaining 501 respondents, 6 did not include their profession and were also eliminated. The final analysis considered 496 respondents. Of the final number (n = 496), 130 respondents were from primary level hospital, 17 from secondary level hospital, and 348 from tertiary level hospitals. The questionnaire was pilot tested with 28 HCWs in two hospitals (one primary and one tertiary hospital) to test for appropriateness of the instrument (van Teijlingen and Hundley, 2001). The questionnaire obtained information from HCWs that included socio-demographic characteristics and pre-decided factors that participants considered to be enablers or hindrances to HP and DP. Data analysis was restricted to HCWs whose daily roles involved consultations with patients and who consented to the study. If any HCW did not consent to the study, they were excluded.

3. Measures

3.1. Enablers

In this study, HCWs were asked to respond to pre-decided factors that enable their participation in HP and DP practices at the healthcare facilities. In this study "enablers" refers to drivers or facilitators (Regmi and Jones, 2020) to HP and DP processes. The assessed factors included (1) "Supportive policies"; (2) "adequate funding"; (3) "availability of information about the target population"; (4) "collaboration among disciplines and organizations"; ((5) "up to date training on HP"; (6) "planning programs with input from different levels"; (7) "adequate

time for HP" (8) "requirements for HP and DP assessment"; (9) "HP and DP related structures"; (10) "operational procedures"; (11) "HP and DP quality appraisal"; (12) "HP and DP orientation course for new employee"; (13) "HP and DP performance evaluation"; (14) "continuing professional development on HP and DP"; (15) "HP and DP manager in facility"; (16) "available budget for HP and DP"; (17) "adequate resources for best practices". The response options for questions 1–9 were "yes" or "no"; for questions 10–16, the responses were "yes", "no" or "I don't know". For question 17, the responses were a Likert scale options of "strongly disagree", "disagree", "neutral", "agree", or "strongly agree". In our study, we had several characters or questions that applied to various indicators of interest. Questions 10–16 had options including "I don't know" and question 17 was on a Likert scale. Other questions applied to other indicators being studied.

3.2. Hindrances

For the purpose of this study, we define hindrances as factors that deter the attainment of set goal and diminish work satisfaction (Flinchbaugh et al., 2015). The following variables were examined (1) "cost"; (2) "lack of HP programmes"; (3) "Facility promotes treatment more than prevention"; (4) "lack of collaboration among disciplines"; (5) "no structure in place for HP"; (6) "lack of HP knowledge and skills"; (7) "lack of time"; (8) "lack of HP programmes"; (9) "patients attitude"; (10) "operational procedures"; (11) "HP budget"; (12) "no discharge guidelines"; (13) "post intervention guidelines"; (14) "inform patients of impacting health factors". Like the enablers above, the responses were categorized into two. In the first category (questions 1–9), respondents were to indicate either "yes" or "no". In the second category (questions 10–14), respondents were asked to indicate any of "yes", "no" or "I don't know".

3.3. Analyses

We first summarized our data using descriptive statistics. Categorical variable calculations were achieved using chi square tests. Healthcare workers were grouped into three - doctors, registered nurses, and allied health workers. The allied health workers comprised physiotherapists, speech and occupational therapists, dieticians, and social workers. A multinomial logistic regression was used to ascertain the influence of enablers and hindrances on the HCW group and level of health care facility. The full model included all factors from the bivariate analysis and factors that had a *p*-value less than 0.15 in the bivariate model (Wang et al., 2012; Liang et al., 2020). Two models were fit: one for enablers only and another for hindrances only. In these independent initial analyses, we fit a multinomial logistic model with all enablers and hindrances that were observed to be associated with HCW group at different levels of health care facility. To fit a best fit model, we used the stepwise backward selection method which involved exclusion of variables that were not statistically significant, starting with those with high *p*-values. Variable backward stepwise selection continued until the model became adequate. The Hosmer–Lemeshow goodness-of-fit test (Hosmer and Lemeshow, 2000) was used to determine the adequacy of the final models on enablers and hindrances of HP and DP. All analyses were done using Stata 15 (StataCorp LLC: Release 15. College Station, TX).

4. Results

4.1. Demographic characteristics

Twenty-three healthcare facilities that participated in the study included three tertiary, one secondary and nineteen primary level healthcare facilities. Among the participants, 24% (n = 119) were males while 75% (n = 370) were females. Most of the participants were from tertiary hospitals (70.46%, n = 353). Furthermore, 26.15% (n = 131)

and 3.39% (n = 17) of the HCWs were from the primary and secondary healthcare levels, respectively. About 39% (38.79%; n = 192) were medical doctors, 47.27% (n = 234) were nurses while 13.94% (n = 69) were allied health workers comprising dieticians, physiotherapists, speech therapists, occupational therapists, and social workers.

4.2. Health promotion and disease prevention enablers

The range of responses on health promotion and disease prevention enablers by HCWs varied from 48.74% (n = 223) among nurses who responded "I don't know" for operational procedures to 0.21% (n = 1) and among medical doctors who responded "yes" to availability of a budget for HP and DP (Supplementary file 1). In addition, programme planning with input from different levels (*p* = 0.003), information about target population (*p* = 0.015), up to date training on HP (*p* = 0.034), provision to access patients' HP needs (*p* < 0.001) were among the variables observed to be significant enablers of HP and DP among health care workers. Other factors observed to promote HP and DP among HCW in the study area were operational procedures, HP and DP quality appraisal, requirements for HP and DP assessment, HP, and DP orientation course for new employee, and continuing professional development on HP and DP (Supplementary file 1).

When specific enablers were controlled for healthcare facility levels, 11 factors were observed to be associated with HCWs at different health care levels (Table 1). The enablers of HP and DP for medical doctors at tertiary health care level for which they responded in affirmative were collaboration among disciplines and organizations (35.13%, n = 124) and adequate time for HP (36.25%; n = 128). On the other hand, at primary and secondary health care level, no factor was associated with HP promotion among medical doctors. We also observed that there were no variables associated with nurses and allied health care workers at primary and secondary health care levels (Table 2). However, at tertiary health care level, 15.30% (n = 54) disagreed on collaboration among disciplines and organization as being an enabler of HP and DP while 14.16% (n = 50) did not know if operational procedure enhances HP and DP. On the other hand, 15.30% (n = 54), 20.96% (n = 74) and 17.28% (n = 61) of the nurses affirmed that HP quality assessment programme, Provisions to access patients' HP need and HP related continuing professional development (CPD) respectively are among the enablers of HP and DP (Table 1).

4.3. Predictors of health promotion and disease prevention enablers

In this study, "nurses" were considered the reference variable in the multivariate models. In a full model, five enablers were observed to be associated with HP and DP among different health workers (Table 2; Unadjusted model). Collaboration among disciplines and organizations (Coeff: 2.16; 95% CI: 1.28–3.66), HP and DP qualitative evaluation (Coeff: 1.84; 95% CI: 1.33–2.54) and continuing professional development on HP and DP (Coeff: 1.39; 95% CI: 0.91–2.13) were the more likely enablers of HP and DP while programme planning with input from different levels (Coeff: 0.375; 95% CI: 0.23–0.62) and, requirements for HP and DP assessment (Coeff: 0.17; 95% CI: 0.11–0.28) were less likely enablers of HP and DP among medical doctors compared to nurses. On the other hand, requirements for HP and DP assessment among allied health workers (Coeff: 0.43; 95% CI: 0.22–0.83) was less likely to be an enabler of HP and DP compared to nurses.

In the final adjusted model, six factors were observed to be predictors of HP and DP among HCWs. Collaborations among disciplines and organizations and HP quality assessment programme were more likely to enhance HP and DP by 2.162 (95% CI: 1.277–3.659) and 1.839 (95% CI: 1.334–2.538) fold respectively, among medical doctors compared to nurses. On the other hand, programme planning with input from different levels (Coeff: 0.375; 95% CI: 0.227–0.621) and provisions to access patients' HP needs (Coeff: 0.171; 95% CI: 0.106–0.275) were less likely to enable HP and DP among medical doctors when compared to

Table 1

Bivariate analysis of association between healthcare workers and health promotion enablers at different healthcare facility levels.

HP Enablers	Responses	Primary Health Care level (n 131)				Secondary Health Care level (n 17)				Tertiary Health Care level (n 353)			
		Medical doctors	Nurses	AHWs	p-value	Medical doctors	Nurses	AHWs	p-value	Medical doctors	Nurses	AHWs	P-value
Supportive policies	No	2.29% (n 3)	19.85% (n 26)	0.76% (n 1)	0.384	11.76% (n 2)	5.88% (n 1)	11.76% (n 2)	1.000	14.45% (n 51)	8.22% (n 29)	6.52% (n 23)	0.123
	Yes	3.05% (n 4)	62.60% (n 82)	5.34% (n 7)		23.53% (n 4)	11.76% (n 2)	23.53% (n 4)		34.84% (n 123)	21.53% (n 76)	8.78% (n 31)	
Collaboration among disciplines and organizations	No	2.53% (n 2)	21.37% (n 28)	0% (n 0)	0.248	23.53% (n 4)	11.76% (n 2)	5.88% (n 1)	0.164	13.88% (n 49)	15.30% (n 54)	7.37% (n 26)	0.000
	Yes	3.82% (n 5)	61.07% (n = 80)	6.11% (n 8)		11.76% (n 2)	5.88% (n 1)	29.41% (n 5)		35.13% (n = 124)	14.45% (n = 51)	7.64% (n 27)	
Programme planning with input from different levels	No	1.53% (n 2)	28.24% (n 37)	2.29% (n 3)	0.934	11.76% (n 2)	11.76% (n 2)	11.76% (n 2)	0.574	28.61% (n 101)	13.03% (n 46)	8.22% (n 29)	0.061
	Yes	3.82% (n 5)	54.20% (n 71)	3.82% (n 5)		23.53% (n 4)	5.88% (n 1)	23.53% (n 4)		20.40% (n 72)	16.71% (n 59)	7.08% (n 25)	
Information about the target population	No	2.29% (n 3)	34.35% (n 45)	3.05% (n 4)	0.899	29.41% (n 5)	11.76% (n 2)	23.53% (n 4)	0.774	26.06% (n 92)	13.03% (n 46)	9.35% (n 33)	0.089
	Yes	3.05% (n 4)	48.09% (n 63)	3.05% (n 4)		5.88% (n 1)	5.88% (n 1)	11.76% (n 2)		22.38% (n 79)	16.71% (n 59)	5.95% (n 21)	
Up to date training on HP	No	2.29% (n 3)	21.37% (n 28)	0.76% (n 1)	0.408	0% (n 0)	5.88% (n 1)	11.76% (n 2)	0.287	20.40% (n 72)	9.07% (n 32)	5.10% (n 18)	0.149
	Yes	3.05% (n 4)	61.07% (n 80)	5.34% (n 7)		35.29% (n 6)	11.76% (n 2)	23.53% (n 4)		28.61% (n 101)	20.68% (n 73)	10.20% (n 36)	
Operational procedures	No	0.76% (n 1)	6.87% (n 9)	0% (n 0)	0.564	5.88% (n 1)	0% (n 0)	0% (n 0)	0.206	13.31% (n 47)	4.53% (n 16)	1.13% (n 4)	0.000*
	Yes	2.29% (n 3)	46.56% (n 61)	2.29% (n 3)		0% (n 0)	11.76% (n 2)	17.65% (n 3)		6.52% (n 23)	12.46% (n 44)	3.97% (n 14)	
	I don't know	2.29% (n 3)	30.53% (n 40)	3.82% (n 5)		29.41% (n 5)	5.88% (n 1)	23.53% (n 4)		29.75% (n 105)	14.16% (n = 50)	9.63% (n 34)	
HP specific structures required	No	2.53% (n 2)	28.24% (n 37)	2.53% (n 2)	0.865	5.88% (n 1)	5.88% (n 1)	5.88% (n 1)	0.768	17.28% (n 61)	10.76% (n 38)	3.68% (n 13)	0.372
	Yes	3.82% (n 5)	56.49% (n 74)	4.58% (n 6)		29.41% (n 5)	11.76% (n 2)	35.29% (n 6)		30.88% (n 109)	19.83% (n 70)	10.76% (n 38)	
HP quality assessment programme	No	2.53% (n 2)	13.74% (n 18)	0% (n 0)	0.052	5.88% (n 1)	0% (n 0)	5.88% (n 1)	0.432	9.91% (n 35)	3.68% (n 13)	2.27% (n 8)	0.000
	Yes	2.53% (n 2)	38.17% (n 50)	0.76% (n 1)		0% (n 0)	5.88% (n 1)	17.65% (n 3)		3.68% (n 13)	15.30% (n 54)	3.40% (n 12)	
	I don't know	2.29% (n 3)	29.01% (n 38)	5.34% (n 7)		29.41% (n 5)	11.76% (n 2)	17.65% (n 3)		34.84% (n 123)	11.33% (n 40)	8.78% (n 31)	
Provisions to access patients' HP need	No	3.05% (n 4)	19.85% (n 26)	2.29% (n 3)	0.137	23.53% (n 4)	5.88% (n 1)	5.88% (n 1)	0.149	33.43% (n 118)	9.07% (n 32)	7.08% (n 25)	0.000
	Yes	2.29% (n 3)	61.07% (n 80)	3.82% (n 5)		11.76% (n 2)	11.76% (n 2)	35.29% (n 6)		13.88% (n 49)	20.96% (n 74)	5.10% (n 18)	
HP induction training for new staff	No	2.53% (n 2)	18.32% (n 24)	3.05% (n 4)	0.468	17.65% (n 3)	0% (n 0)	11.76% (n 2)	0.251	20.40% (n 72)	2.83% (n 10)	4.25% (n 15)	0.000
	Yes	2.53% (n 2)	34.35% (n 45)	2.53% (n 2)		0% (n 0)	11.76% (n 2)	11.76% (n 2)		2.27% (n 8)	20.11% (n 71)	3.68% (n 13)	
	I don't know	2.29% (n 3)	30.53% (n 40)	2.53% (n 2)		17.65% (n 3)	5.88% (n 1)	17.65% (n 3)		26.63% (n 94)	7.08% (n 25)	6.52% (n 23)	
HP performance appraisal	No	3.05% (n 4)	20.61% (n 27)	2.53% (n 2)	0.151	17.65% (n 3)	5.88% (n 1)	11.76% (n 2)	0.773	17.56% (n 62)	5.38% (n 19)	2.83% (n 10)	0.000
	Yes	0.76% (n 1)	32.82% (n 43)	0.76% (n 1)		0% (n 0)	0% (n 0)	5.88% (n 1)		2.27% (n 8)	15.86% (n 56)	1.98% (n 7)	
	I don't know	2.53% (n 2)	29.01% (n 38)	3.82% (n 5)		17.65% (n 3)	11.76% (n 2)	23.53% (n 4)		29.46% (n 104)	8.78% (n 31)	9.63% (n 34)	
HP related continuing professional development (CPD)	No	2.29% (n 3)	25.95% (n 34)	2.29% (n 3)	0.738	17.65% (n 3)	5.88% (n 1)	11.76% (n 2)	0.247	16.15% (n 57)	5.38% (n 19)	3.12% (n 11)	0.000
	Yes	2.53% (n 2)	37.40% (n 49)	2.53% (n 2)		0% (n 0)	11.76% (n 2)	17.65% (n 3)		6.52% (n 23)	17.28% (n 61)	3.12% (n 11)	
	I don't know	2.53% (n 2)	19.85% (n 26)	2.29% (n 3)		17.65% (n 3)	0% (n 0)	11.76% (n 2)		26.63% (n 94)	7.65% (n 27)	8.22% (n 29)	
Sufficient resources in support of best practices of HP	Strongly disagree	0% (n 0)	10.69% (n 14)	0% (n 0)	0.065	11.76% (n 2)	5.88% (n 1)	11.76% (n 2)	0.576	8.50% (n 30)	3.68% (n 13)	1.98% (n 7)	0.001*
	Disagree	0.76% (n 1)	29.01% (n 38)	0% (n 0)		23.53% (n 4)	11.76% (n 2)	11.76% (n 2)		20.68% (n 73)	9.63% (n 34)	3.97% (n 14)	
	Neutral	1.15% (n 2)	18.32% (n 24)	3.82% (n 5)		0% (n 0)	0% (n 0)	11.76% (n 2)		11.05% (n 39)	4.53% (n 16)	4.82% (n 17)	
	Agree	1.15% (n 2)	21.37% (n 28)	2.29% (n 3)		0% (n 0)	0% (n 0)	5.88% (n 1)		6.80% (n 24)	10.76% (n 38)	3.12% (n 11)	
	Strongly agree	1.15% (n 2)	7.63% (n 10)	0% (n 0)		5.88% (n 1)	0% (n 0)	0% (n 0)		3.12% (n 11)	3.40% (n 12)	1.42% (n 5)	
Adequate funding	No	2.29% (n 3)	22.14% (n 29)	0.76% (n 1)	0.416	11.76% (n 2)	5.88% (n 1)	17.65% (n 3)	0.812	20.40% (n 72)	9.92% (n 35)	5.95% (n 21)	0.403
	Yes												

(continued on next page)

Table 1 (continued)

HP Enablers	Responses	Primary Health Care level (n 131)				Secondary Health Care level (n 17)				Tertiary Health Care level (n 353)			
		Medical doctors	Nurses	AHWs	p-value	Medical doctors	Nurses	AHWs	p-value	Medical doctors	Nurses	AHWs	P-value
Adequate time for HP	No	3.05%	60.31%	5.34%	0.398	23.53%	11.76%	17.65%	0.774	28.90%	19.83%	9.07%	
		(n 4)	(n 79)	(n 7)		(n 4)	(n 2)	(n 3)		(n 102)	(n 70)	(n 32)	
		2.29%	20.61%	0.76%		5.88%	5.88%	11.76%		13.03%	13.31%	5.38%	0.007
HP Coordinator in facility	Yes	3.05%	61.83%	5.34%	0.197	29.41%	11.76%	23.53%	0.321	36.26%	16.43%	9.92%	
		(n 4)	(n 81)	(n 7)		(n 5)	(n 2)	(n 4)		(n = 128)	(n 58)	(n 35)	
		1.15%	16.03%	0.76%		5.88%	5.88%	11.76%		18.41%	8.50%	2.27%	0.000
Identifiable budget for HP	No	1.15%	18.32%	3.05%	0.284	17.65%	0%	5.88%	0.180	9.92%	4.82%	3.97%	
		(n 2)	(n 24)	(n 4)		(n 3)	(n 0)	(n 1)		(n 35)	(n 17)	(n 14)	
		0%	11.45%	0%		0%	0%	0%		0.28%	5.66%	1.42%	
I don't know	Yes	3.05%	51.15%	3.82%	0.284	0%	5.88%	11.76%	0.180	3.68%	9.92%	4.25%	
		(n 1)	(n 67)	(n 5)		(n 0)	(n 1)	(n 2)		(n 13)	(n 35)	(n 15)	
		3.05%	19.85%	1.15%		5.88%	5.88%	17.65%		27.20%	11.61%	8.22%	
I don't know	I don't know	3.05%	56.49%	3.05%	0.284	17.65%	17.65%	35.29%	0.180	39.66%	20.68%	9.63%	
		(n 4)	(n 26)	(n 2)		(n 1)	(n 1)	(n 3)		(n 96)	(n 41)	(n 29)	
		3.82%	56.49%	3.05%		17.65%	17.65%	35.29%		39.66%	20.68%	9.63%	
		(n 5)	(n 74)	(n 4)		(n 3)	(n 3)	(n 6)		(n 140)	(n 73)	(n 34)	

*Note: Some cells have frequencies equal or less than 5.

nurses.

Among the allied health workers, HP and DP performance evaluation was more likely to enable HP and DP by 1.86 (95% CI: 1.16–2.98) fold compared to nurses. On the other hand, programme planning with input from different levels (Coeff: 0.483, 95% CI: 0.246–0.952); provision to access patients' HP needs (Coeff: 0.429, 95%CI: 0.224–0.819), HP and DP orientation course for new employees (Coeff: 0.617; 95% CI: 0.40–0.952) were less likely to enable HP and DP compared to nurses (Table 2).

4.4. Health promotion and disease prevention hindrances

Eight factors were observed to be hindrances of HP and DP among health care works. These included – facility promoting treatment more than prevention, absence of HP structure, practice guidelines incorporating HP, and lack of HP budget (p < 0.05). Others include – lack of discharge and post intervention guidelines, lack of time and patients' attitude (Supplementary file 2).

At health facility level, seven factors were observed to be hindrances of HP and DP (Table 3). The hindrances of HP and DP at tertiary health care levels among medical doctors for which the responses were affirmative were lack of collaboration among disciplines (27.22%, n 92) and lack of structures for HP (31.95%; n 108). On the other hand, 105 (31.16%) and 140 (41.30%) medical doctors did not know whether practice guidelines incorporating HP and HP budget respectively, were hindrances of HP and DP. Furthermore, 87 (26.13%) did not know whether discharge guidelines and post intervention guidelines were hindrances of HP and DP. There were not hindrances associated with medical doctors at primary and secondary health care. Furthermore, there were no hindrances to HP and DP associated with Allied health workers at all health care levels. At primary health care level, 72 (58.06%) nurses suggested that facility promoting treatment more than prevention was not a hindrance to HP and DP (Table 3).

4.5. Predictors of hindrances for health promotion and disease prevention

In a full model, seven factors were identified as hindrances of health promotion and disease prevention among HCWs (Table 4: Unadjusted model). Operational costs (Coeff: 0.503; 95% CI: 0.316–0.802) and patient attitude (Coeff: 0.596; 95% CI: 0.402–0.886) were observed as less likely hindrances of HP and DP among medical doctors as compared to nurses. On the other hand, lack of time (Coeff: 3.109; 95% CI: 1.807–5.353), promotion treatment more than prevention (Coeff: 1.693;

95% CI: 1.075–2.667) and lack of structures in place for HP (Coeff: 1.985; 95% CI: 1.262–3.123) were observed as more likely hindrances of HP and DP among medical doctors compared to nurses. On the other hand, lack of practice guidelines incorporating HP (Coeff: 2.723; 95% CI: 1.576–4.705) and HP budget (Coeff: 0.496; 95% CI: 0.324–0.758) hindered HP and DP among allied health workers 1.576 and 0.496 times more compared to nurses.

In the final adjusted model, seven factors were observed to be predictors of HP and DP hindrances among HCWs. Of these, lack of time (Coeff: 3.009; 95% CI:1.767–5.122), lack of structure for HP (Coeff: 1.90; 95% CI: 1.242–2.907), facility promoting treatment more than prevention (Coeff: 1.997; 95% CI: 1.302–3.063) were the more likely hindrances of HP and DP among medical doctors while patient attitude (Coeff: 0.576; 95% CI: 0.389–0.854), and operational costs (Coeff: 0.541; 95% CI: 0.346–0.847) were observed as less likely hindrances of HP and DP among medical doctors compared to nurses. On the other hand, lack of practice guidelines incorporating HP (Coeff: 2.751; 95% CI: 1.644–4.603) and lack of HP budget (Coeff: 0.541; 95% CI: 0.365–0.804) were the factors hindering HP and DP among allied health workers compared to Nurses.

5. Discussion

This study sought to elicit participants' responses about pre-decided HP and DP enablers and hindrances at different health care levels with a view to providing insights to inform future health promotion and disease prevention policy implementation. Healthcare workers indicated factors related to healthcare system organizational capacities and interpersonal relation (such as collaborations among disciplines and organizations, programme planning with input from different levels, requirements for HP and DP assessment, HP and DP orientation course for new employee, and HP and DP performance evaluation) as enablers to HP and DP practice. Similarly, organizational, and individual factors (such as patients' attitude, lack of time, cost, facility promoting treatment more than prevention, lack of structure in place for HP, operational procedure, and HP budget) were reported as potential hindrances to HP and DP practices. Our findings reveal that the municipality need to think of HP and DP beyond health care, and concede that creating health requires investments in structures that reduce avoidable risk factors (Galea and Maani, 2020).

The results of this study are in conformity with those of existing literature revealing that HCWs are knowledgeable on the relevance of health promotion in health and wellbeing (Stanulewicz et al., 2020;

Table 2
Unadjusted and adjusted Predictors models on the enablers of HP and DP among health care workers.

HP enablers	Professions	Coeff (unadjusted)	95% CI	Coeff (adjusted)	95% CI
Supportive policies	Nurses (Reference variable)				
	Medical doctors	0.97	0.56–1.68		
Collaborations among disciplines and organizations	Allied workers	0.66	0.32–1.37		
	Nurses (Reference variable)				
Up to date training on HP	Medical doctors	2.18	1.27–3.74	2.16	1.28–3.66
	Allied workers	1.63	0.79–3.35	1.58	0.78–3.21
Programme planning with input from different levels	Nurses (Reference variable)				
	Medical doctors	0.65	0.38–1.11		
Operational procedures	Allied workers	1.05	0.49–2.20		
	Nurses (Reference variable)				
HP and DP qualitative evaluation	Medical doctors	0.43	0.25–0.74	0.38	0.23–0.62
	Allied workers	0.52	0.25–1.05	0.48	0.25–0.95
Requirements for HP and DP assessment	Nurses (Reference variable)				
	Medical doctors	1.86	1.32–2.62	1.84	1.33–2.54
HP and DP orientation course for new employee	Allied workers	1.32	0.82–2.1	1.50	0.95–2.37
	Nurses (Reference variable)				
HP and DP performance evaluation	Medical doctors	0.17	0.11–0.28	0.17	0.11–0.28
	Allied workers	0.43	0.22–0.83	0.43	0.22–0.82
Continuing professional development on HP and DP	Nurses (Reference variable)				
	Medical doctors	0.87	0.61–1.22	0.88	0.63–1.23
	Allied workers	0.62	0.39–0.97	0.62	0.40–0.95
	Nurses (Reference variable)				
	Medical doctors	0.86	0.56–1.33	1.06	0.76–1.49
	Allied workers	1.68	0.94–2.99	1.86	1.16–2.98
	Nurses (Reference variable)				
	Medical doctors	1.39	0.91–2.13		
	Allied workers	1.08	0.63–1.86		

Sanchez et al., 2017; Pati et al., 2017; Calderón et al., 2011). The findings support several themes from literature which included: inter-sectoral collaboration (Danaher, 2011), patients attitudes, lack of resources (Moreno-Peral et al., 2015), and evaluation (Gibson et al., 2015). Strengthening HP practice among HCWs at various levels of healthcare service has the potential of producing healthcare professionals that will expedite not only the achievement of the universal health coverage but patients' satisfaction and wellbeing.

5.1. HP enablers

The healthcare system comprises of multidisciplinary workforce. Perceptions of medical doctors pertaining to HP and DP may vary from those of nurses or allied health workers. Regardless of these variations, their combined effort to address HP and DP culminate in the attainment of desired health goal for the population, hence the need for collaboration among disciplines. Collaboration among disciplines was observed to be particularly important among medical doctors who were found to be 2.16 times more likely to see it as an enabler compared to nurses. Such partnership results in a relationship where collaborating teams achieve greater results than they can as individuals (Hope Corbin et al., 2018).

The results show that programme planning with inputs from different levels were less likely to be enablers of health promotion and disease prevention among medical doctors and allied health workers as compared to nurses. Although HP programme planning is a strategic process in the health delivery system involving formulation, implementation, and evaluation stages (Kabeyi, 2019), involvement of several members at formulation stage is critical in its implementation and evaluation. According to Kabeyi (2019) participating members should be credible, knowledgeable and have proper understanding to educate others. The results obtained in our study suggest that doctors and allied health workers may not be involved in this important phase. This ultimately impacts on the importance of assessment of HP and DP in health care delivery being an important enabler of HP and DP. According to the WHO, programme planning should be drawn by those who will

implement it (Shuey et al., 2016). However, this has remained a challenge in many health systems where programme planning is drawn by leaders and implemented by HCWs (Shuey et al., 2016).

With the speedy growth and advancement of the healthcare sector, both in terms of its operation and expanding employee needs, performance evaluation among HCWs has become normal. In this study, we observed that AHWs were nearly twice as nurses more likely to consider HP and DP performance evaluation as practice enabler. This is because these allied health workers are increasingly becoming key primary, secondary and tertiary healthcare service providers (Lizarondo et al., 2014) and performance evaluations enable the services provided by the AHWs to be aligned with its strategic goals (Lizarondo et al., 2014). Worldwide, the needs of patients are multifaceted and require multidisciplinary approach to addressing them. Interdisciplinary collaboration in an effort to deliver patient centered care (PCC) is essential and has proven to improve outcome in a wide range of health and disease conditions (Tang et al., 2015). Among medical doctors and allied health workers are several collaborative practices that promote information sharing on patients, care coordination, management plan development, and shared common goals (Saint-Pierre et al., 2018). Similarly, there is an increased professional performance evaluation of physicians (Overeem et al., 2012) which leads to an improved understanding by the doctors of professional goals.

5.2. Hindrances

This study identified lack of time as a factor that had significant impact on medical doctors' ability to engage in HP and DP. It was observed that medical doctors were three times more likely than nurses to see lack of time as a driver to their non-practice of HP and DP. With the overwhelmed public healthcare system in South Africa, clinical practice is demanding, leaving doctors with little time for health promotion during the working hours. Routine clinical interaction of doctors with patients uniquely places them to identify and address HP and DP issues that will make a difference in patients' lives - signifying that if we want HP and DP to have a meaningful population impact, we need to

Table 3
Bivariate analysis of association between healthcare workers and health promotion hindrances at different healthcare facility levels.

HP Hindrances	Responses	Primary Health Care level (n 131)				Secondary Health Care level (n 17)				Tertiary Health Care level (n 353)			
		Medical doctors	Nurses	AHWs	p-value	Medical doctors	Nurses	AHWs	p-value	Medical doctors	Nurses	AHWs	P-value
Operational Cost	No	5 (3.97%)	73 (57.94%)	4 (3.17%)	0.623	3 (18.75%)	2 (12.50%)	5 (31.25%)	0.719	126 (37.28%)	66 (19.53%)	33 (9.76%)	0.168
	Yes	2 (1.59%)	38 (30.16%)	4 (3.17%)		3 (18.75%)	1 (6.25%)	2 (12.50%)		51 (15.09%)	41 (12.13%)	21 (6.21%)	
Lack of HP programmes	No	2 (1.60%)	49 (39.20%)	3 (2.40%)	0.671	1 (6.25%)	2 (12.50%)	5 (31.25%)	0.117	72 (21.30%)	47 (13.91%)	29 (8.58%)	0.240
	Yes	5 (4.00%)	61 (48.80%)	5 (4.00%)		5 (31.25%)	1 (6.25%)	2 (12.50%)		105 (31.07%)	60 (17.75%)	25 (7.40%)	
Facility promotes treatment more than prevention	No	1 (0.08%)	72 (58.06%)	4 (3.23%)	0.018*	1 (6.25%)	2 (12.50%)	3 (18.75%)	0.319	86 (25.52%)	65 (19.29%)	31 (9.20%)	0.130
	Yes	6 (4.84%)	37 (29.84%)	4 (3.23%)		5 (31.25%)	1 (6.25%)	4 (25.00%)		90 (26.70%)	42 (12.46%)	23 (6.82%)	
Lack of collaboration among disciplines	No	3 (2.42%)	53 (42.74%)	3 (2.42%)	0.804	2 (12.50%)	2 (12.50%)	5 (31.25%)	0.356	85 (25.15%)	69 (20.41%)	30 (8.88%)	0.026
	Yes	4 (3.23%)	56 (45.16%)	5 (4.03%)		4 (25.00%)	1 (6.25%)	2 (12.50%)		92 (27.22%)	38 (11.24%)	24 (7.10%)	
No structure in place for HP	No	2 (1.61%)	62 (50.00%)	5 (4.03%)	0.317	3 (18.75%)	3 (18.75%)	6 (37.50%)	0.180	69 (20.41%)	58 (17.16%)	29 (8.58%)	0.021
	Yes	5 (4.03%)	47 (37.90%)	3 (2.42%)		3 (18.75%)	0 (0.00%)	1 (6.25%)		108 (31.95%)	49 (14.50%)	25 (7.40%)	
Lack of Practice guidelines incorporating HP	No	1 (0.80%)	9 (7.20%)	0 (0.00%)	0.564	1 (6.25%)	0 (0.00%)	0 (0.00%)	0.206	47 (13.95%)	16 (4.75%)	4 (1.19%)	0.000*
	Yes	3 (2.40%)	61 (48.80%)	3 (2.40%)		0 (0.00%)	2 (12.50%)	3 (18.75%)		23 (6.82%)	44 (13.06%)	14 (4.15%)	
HP budget	I don't know	3 (2.40%)	40 (32.00%)	5 (4.00%)		5 (31.25%)	1 (6.25%)	4 (25.00%)		105 (31.16%)	50 (14.84%)	34 (10.09%)	
	No	2 (1.56%)	24 (18.75%)	4 (3.13%)	0.284	3 (18.75%)	0 (0.00%)	1 (6.25%)	0.180	35 (10.32%)	17 (5.01%)	14 (4.13%)	0.000*
Discharge Guidelines	Yes	0 (0.00%)	15 (11.72%)	0 (0.00%)		0 (0.00%)	0 (0.00%)	0 (0.00%)		1 (0.29%)	20 (5.90%)	5 (1.47%)	
	I don't know	5 (3.91%)	74 (57.81%)	4 (3.13%)		3 (18.75%)	3 (18.75%)	6 (37.50%)		140 (41.30%)	73 (21.53%)	34 (10.03%)	
Post intervention guidelines	No	3 (2.52%)	18 (15.13%)	3 (2.52%)	0.228	3 (18.75%)	1 (6.25%)	0 (0.00%)	0.059	63 (18.92%)	25 (7.51%)	14 (4.20%)	0.000
	Yes	1 (0.84%)	41 (34.45%)	2 (1.68%)		0 (0.00%)	2 (12.50%)	2 (12.50%)		21 (6.30%)	57 (17.12%)	6 (1.80%)	
Informs patients of impacting health factors	I don't know	3 (2.52%)	46 (38.66%)	2 (1.68%)		3 (18.75%)	0 (0.00%)	5 (31.25%)		87 (26.13%)	28 (8.41%)	32 (9.60%)	
	No	2 (1.67%)	16 (13.33%)	2 (1.67%)	0.835	3 (18.75%)	0 (0.00%)	1 (6.25%)	0.328	62 (18.90%)	27 (8.23%)	16 (4.88%)	0.000
Informs patients of impacting health factors	Yes	2 (1.67%)	45 (37.50%)	3 (2.50%)		0 (0.00%)	1 (6.25%)	1 (6.25%)		23 (7.01%)	53 (16.16%)	6 (1.83%)	
	I don't know	3 (2.50%)	44 (36.67%)	3 (2.50%)		3 (18.75%)	2 (12.50%)	5 (31.25%)		87 (26.52%)	25 (7.62%)	29 (8.48%)	
Informs patients of impacting health factors	No	6 (4.80%)	99 (79.20%)	8 (6.40%)	0.592	1 (6.25%)	0 (0.00%)	0 (0.00%)	0.411	5 (1.49%)	9 (2.68%)	2 (0.59%)	0.242
	Yes	0 (0.00%)	0 (0.00%)	0 (0.00%)		0 (0.00%)	0 (0.00%)	0 (0.00%)		155 (46.13%)	97 (28.87%)	46 (13.69%)	
Informs patients of impacting health factors	I don't know	1 (0.80%)	11 (8.80%)	0 (0.00%)		5 (31.25%)	3 (18.75%)	7 (43.75%)		12 (3.57%)	5 (1.49%)	5 (1.49%)	

*Note: Some cells have frequencies equal or less than 5.

Table 4
Unadjusted and adjusted multinomial models for hindrances of HP and DP among HCWs.

HR Hindrances	Professions	Coeff (unadjusted)	95% conf. interval	Coeff (adjusted)	95% conf. interval
Cost	Nurses (Reference variable)				
	Doctors	0.503	0.316–0.802	0.541	0.346–0.847
	Allied workers	1.105	0.592–2.064	1.096	0.608–1.976
Lack of HP programmes	Nurses (Reference variable)				
	Doctors	1.071	0.681–1.684		
	Allied workers	0.619	0.335–1.146		
Facility promotes treatment more than prevention	Nurses (Reference variable)				
	Doctors	1.693	1.075–2.667	1.997	1.302–3.063
	Allied workers	1.555	0.822–2.941	1.492	0.825–2.700
Lack of collaboration among disciplines	Nurses (Reference variable)				
	Doctors	1.308	0.837–2.045		
	Allied workers	0.901	0.477–1.699		
No structure in place for HP	Nurses (Reference variable)				
	Doctors	1.985	1.262–3.123	1.900	1.242–2.907
	Allied workers	0.947	0.507–1.770	0.750	0.415–1.356
Lack of practice guidelines incorporating HP	Nurses (Reference variable)				
	Doctors	1.003	0.716–1.404	0.948	0.688–1.307
	Allied workers	2.723	1.576–4.705	2.751	1.644–4.603
Lack of HP budget	Nurses (Reference variable)				
	Doctors	1.205	0.879–1.652	1.215	0.897–1.646
	Allied workers	0.496	0.324–0.758	0.541	0.365–0.804
Lack of time	Nurses (Reference variable)				
	Doctors	3.109	1.807–5.353	3.009	1.767–5.122
	Allied workers	0.948	0.518–1.735	0.976	0.538–1.774
Patients' attitude	Nurses (Reference variable)				
	Doctors	0.596	0.402–0.886	0.576	0.389–0.854
	Allied workers	0.652	0.376–1.127	0.642	0.373–1.107

ensure that medical doctors have time to contribute. This finding is consistent with existing studies (Maphumulo and Bhengu, 2019; Patel et al., 2018).

Another feature identified in this study was the role of facility promoting treatment more than prevention. Among medical doctors, they were nearly twice as nurses to identify that this is a hindrance to HP and DP. In recent years, focus has been on diagnosis and treatment. This factor may have become critical for doctors as they are the ones that make diagnosis of patients, and eventually find out that many disease conditions and complications are conditions that could have been prevented. The need of the hour is specific strategic HP and DP programs for all chronic diseases and conditions.

Our results showed that lack of practice guidelines incorporating HP is a hindrance and this is in agreement with other studies (CDC, 2020; Lodel et al., 2020). The current study showed that AHWs were 2.8 times more likely to see operational procedures as a hindrance to HP practice compared to nurses. Healthcare worker managers that report to top management are often assessed based on stringent monitoring standard operating procedures (SOPs) that are devoid of any relationship with the healthcare facility's strategic plan (Cogin et al., 2016). Another reason for AHWs seeing operating procedures as hindrance may be related to the process of SOP development among the AHWs. Furthermore, best practice towards SOP development requires input from all HCWs in order to enhance health care delivery (Akyar, 2013).

This study has identified some factors that enhance and as well hinder HP and DP practices among HCWs. The study recommends that a comprehensive intervention plan involving multi-level collaboration in HP and DP program planning and implementation. The implication of these findings is that the HCWs for whom HP and DP practice is advocated have themselves elicited factors that will make HP and DP effective and not imported items imposed on them. The enablers can be instituted at healthcare facilities to enable healthcare workers to efficiently practice HP and DP.

5.3. Study limitation and strengths

Our study is cognizant that because of financial constraints, the study sample was drawn from HCWs from public health facilities that

primarily serve one province of the nine provinces in South Africa. Future study can be designed with subjects drawn from multiple locations including those from both private and public health system.

6. Conclusion

Enablers and hindrances to HP and DP are essential determinants of HCWS motivations or discouragements to effective practice. The current study has demonstrated the need for stakeholders to understand the HP and DP practice conditions of HCWs. This study reveals that some hindrances are connected to the bigger health system such as budgeting, staff training, and operational guidelines. To address the identified hindrances, role players need experience, the mindset and behaviour that align with health goals intended for promotion which in turn will ensure that implementation strategies are practical, authentic, and systematically consistent.

Health sectors and other institutions or organizations should be encouraged and empowered to adopt health promoting policies and strategies to ensure sustainability. There is need to create a supportive environment geared towards strengthening community action and skills acquisition. Furthermore, health promoting schools, non-profit organizations and hospitals should be encouraged to actively participate in HP and DP activities. Finally, health promotion should be fully integrated into undergraduate medical, nursing, and AHWs trainings. If more healthcare institutions and the bigger health systems methodically dismantle hindrances and encourage HCWs to practice HP and DP, perhaps, we will eventually see the gap close between the global health goals for the population and reality.

Funding

This research was supported by the University of KwaZulu-Natal, College of Health Sciences scholarship funding.

8. Ethics statement

Permissions to conduct the study were received from the University of KwaZulu Natal Biomedical Research Ethics Committee, and the

Research Committee of the Eastern Cape Health Department. Individual informed, written consent was obtained from participants prior to data collection, and the data extract was anonymised.

CRedit authorship contribution statement

Herbert I. Melariri: Conceptualization, Methodology, Software, Validation, Formal analysis, Investigation, Resources, Data curation, Writing - original draft, Writing - review & editing, Visualization, Project administration. **Chester Kalinda:** Software, Validation, Formal analysis, Data curation, Writing - review & editing, Visualization. **Moses J. Chimbari:** Validation, Resources, Writing - review & editing, Visualization, Supervision, Project administration, Funding acquisition.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Acknowledgments

The authors would like to thank the healthcare workers in the EC Department of Health and the Nelson Mandela Bay Health District for voluntarily participating in the study.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.pmedr.2021.101462>.

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Supplementary File 1: Correlations between health promotion and disease prevention enablers and healthcare workers

HP and DP Enablers	Responses	Healthcare workers (%)			<i>p-value</i>
		Medical doctors	Nurses	AHWs	
Supportive policies	No	11.89% (n=56)	11.89% (n=56)	5.52% (n=26)	0.146
	Yes	27.81% (n=131)	33.97% (n=160)	8.92% (n=42)	
Collaboration among disciplines and organizations	No	11.73% (n=55)	17.91% (n=84)	5.76% (n=27)	0.099
	Yes	27.93% (n=131)	28.14% (n=132)	8.53% (n=40)	
Programme planning with input from different levels	No	22.34% (n=105)	18.09% (n=85)	7.23% (n=34)	0.003
	Yes	17.23% (n=81)	27.87% (n=131)	7.23% (n=34)	
Information about the target population	No	21.37% (n=100)	19.87% (n=93)	8.76% (n=41)	0.015
	Yes	17.95% (n=84)	26.28% (n=123)	5.77% (n=27)	
Up to date training on HP	No	15.96% (n=75)	12.98% (n=61)	4.47% (n=21)	0.034
	Yes	39.57% (n=186)	45.96% (n=216)	14.47% (n=68)	
Operational procedures	No	10.25% (n=49)	5.23% (n=25)	0.84% (n=4)	0.000
	Yes	5.44% (n=26)	22.38% (n=107)	4.18% (n=20)	
	I don't know	39.33% (n=188)	48.74% (n=223)	14.02% (n=67)	
HP and DP related structures	No	13.59% (n=64)	16.14% (n=76)	3.40% (n=16)	0.252
	Yes	25.27% (n=119)	31.00% (n=146)	10.62% (n=50)	
HP and DP quality appraisal	No	8.15% (n=38)	6.65% (n=31)	1.93% (n=9)	0.000
	Yes	3.22% (n=15)	22.53% (n=105)	3.43% (n=16)	
	I don't know	28.11% (n=131)	17.17% (n=80)	8.80% (n=41)	
Requirements for HP and DP assessment	No	27.81% (n=126)	13.02% (n=59)	6.40% (n=29)	0.000
	Yes	11.92% (n=54)	34.44% (n=156)	6.40% (n=29)	
HP and DP orientation course for new employee	No	16.35% (n=77)	7.22% (n=34)	4.46% (n=21)	0.000
	Yes	2.12% (n=10)	25.05% (n=118)	3.61% (n=17)	
	I don't know	39.70% (n=187)	46.28% (n=218)	14.01% (n=66)	
HP and DP performance evaluation	No	14.68% (n=69)	10.00% (n=47)	2.98% (n=14)	0.000
	Yes	1.91% (n=9)	21.06% (n=99)	1.91% (n=9)	
	I don't know	23.19% (n=109)	15.10% (n=71)	9.15% (n=43)	

continuing professional development on HP and DP	No	13.35% (n=63)	11.44% (n=54)	3.39% (n=16)	0.000
	Yes	5.30% (n=25)	23.73% (n=112)	3.39% (n=16)	
	I don't know	20.97% (n=99)	11.23% (n=53)	7.20% (n=34)	
Adequate resources for best practices	Strongly disagree	6.53% (n=32)	5.71% (n=28)	1.84% (n=9)	0.001
	Disagree	15.92% (n=78)	15.10% (n=74)	3.27% (n=16)	
	Neutral	8.37% (n=41)	8.16% (n=40)	4.90% (n=24)	
	Agree	5.31% (n=26)	13.47% (n=66)	3.06% (n=15)	
	Strongly agree	2.86% (n=14)	4.49% (n=22)	1.02% (n=5)	
Adequate funding	No	16.38% (n=77)	13.83% (n=65)	5.32% (n=25)	0.064
	Yes	23.40% (n=110)	32.13% (n=151)	8.94% (n=42)	
Adequate time for HP	No	10.62% (n=50)	15.31% (n=75)	4.67% (n=22)	0.220
	Yes	29.09% (n=137)	29.94% (n=141)	9.77% (n=46)	
HP and DP manager in facility	No	15.09% (n=72)	10.90% (n=52)	2.31% (n=11)	0.000
	Yes	2.94% (n=14)	21.59% (n=103)	4.61% (n=22)	
	I don't know	21.17% (n=101)	14.26% (n=68)	7.13% (n=34)	
available budget for HP and DP	No	8.28% (n=40)	8.49% (n=41)	3.93% (n=19)	0.000
	Yes	0.21% (n=1)	7.25% (n=35)	1.04% (n=5)	
	I don't know	30.64% (n=148)	31.06% (n=150)	9.11% (n=44)	

Supplementary file 2: Correlations between health promotion and disease prevention hindrances and healthcare workers

HP and DP Hindrances	Responses	Healthcare workers (%)			<i>p-value</i>
		Medical doctors	Nurses	AHWs	
Cost	No	27.92% (n=134)	29.38% (n=141)	8.75% (n=42)	0.221
	Yes	11.67% (n=56)	16.67% (n=80)	5.63% (n=27)	
Lack of HP programmes	No	15.66% (n=75)	20.46% (n=98)	7.72% (n=37)	0.123
	Yes	24.01% (n=115)	25.47% (n=122)	6.68% (n=32)	
Facility promotes treatment more than prevention	No	18.45% (n=88)	29.14% (n=139)	7.97% (n=38)	0.003
	Yes	21.17% (n=101)	16.77% (n=80)	6.50% (n=31)	
Lack of collaboration among disciplines	No	18.83% (n=90)	25.94% (n=124)	7.95% (n=38)	0.159
	Yes	20.92% (n=100)	19.87% (n=95)	6.49% (n=31)	
No structure in place for HP	No	15.48% (n=74)	25.73% (n=123)	8.37% (n=40)	0.001
	Yes	24.27% (n=116)	20.08% (n=96)	6.07% (n=29)	
Lack of Operational procedures	No	10.25% (n=49)	5.23% (n=25)	0.84% (n=4)	0.000
	Yes	5.44% (n=26)	22.38% (n=107)	4.18% (n=20)	
	I don't know	23.64% (n=113)	19.04% (n=91)	8.99% (n=43)	
Lack of HP budget	No	8.28% (n=40)	8.49% (n=41)	3.93% (n=19)	0.000
	Yes	0.02% (n=1)	7.25% (n=35)	1.04% (n=5)	
	I don't know	30.64% (n=148)	31.06% (n=150)	9.11% (n=44)	
Lack of discharge Guidelines	No	14.74% (n=69)	9.40% (n=44)	3.63% (n=17)	0.000
	Yes	4.70% (n=22)	21.37% (n=100)	2.14% (n=10)	
	I don't know	19.87% (n=93)	15.81% (n=74)	8.33% (n=39)	
Lack of post intervention guidelines	No	14.44% (n=67)	9.26% (n=43)	4.09% (n=19)	0.000
	Yes	5.39% (n=25)	21.34% (n=99)	2.16% (n=10)	
	I don't know	20.04% (n=93)	15.30% (n=71)	7.97% (n=37)	
Informs patients of impacting health factors	No	1.26% (n=6)	1.89% (n=9)	0.42% (n=2)	0.991
	Yes	34.80% (n=166)	41.72% (n=199)	12.79% (n=61)	
	I don't know	3.73% (n=13)	3.35% (n=16)	1.05% (n=5)	

Lack of HP knowledge and skills	No	31.80% (n=152)	35.77% (n=171)	12.34% (n=59)	0.311
	Yes	7.53% (n=36)	10.46% (n=50)	2.09% (n=10)	
Lack of time	No	4.60% (n=22)	13.18% (n=63)	4.18% (n=20)	0.000
	Yes	34.73% (n=166)	33.05% (n=158)	10.25% (n=49)	
Lack of HP programmes	No	15.66% (n=75)	20.46% (n=98)	7.72% (n=37)	0.123
	Yes	24.01% (n=115)	25.47% (n=122)	6.68% (n=32)	
Patients' attitude	No	21.09% (n=101)	18.37% (n=88)	7.31% (n=35)	0.017
	Yes	18.37% (n=88)	27.77% (n=133)	7.10% (n=34)	

Thirteen enablers and Eight hindrances to HP practice among HCWs were identified in Chapter three. The enabling predictor variables for medical doctors were ‘collaboration among disciplines and organizations’ and ‘programme planning’, while the hindering predictor variables were ‘facility promoting treatment more than prevention’ and ‘lack of practice guidelines incorporating HP’. The fourth chapter presents findings on the HP training, attitudes, and practice (TAP) among healthcare professionals in the Nelson Mandela Bay municipality.

Chapter 4

Training, Attitudes, and Practice (TAP) among healthcare professionals in the Nelson Mandela Bay municipality, South Africa: A Health Promotion and Disease prevention perspective

Melariri HI, Kalinda C, Chimbari MJ (2021) Training, Attitudes, and Practice (TAP) among healthcare professionals in the Nelson Mandela Bay municipality, South Africa: A health promotion and disease prevention perspective. PLoS ONE 16(11): e0259884.
<https://doi.org/10.1371/journal.pone.0259884>

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Article in PLoS ONE November 2021

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RESEARCH ARTICLE

Training, Attitudes, and Practice (TAP) among healthcare professionals in the Nelson Mandela Bay municipality, South Africa: A *health promotion and disease prevention perspective*

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OPEN ACCESS

Citation: Melariri HI, Kalinda C, Chimbari MJ (2021) Training, Attitudes, and Practice (TAP) among healthcare professionals in the Nelson Mandela Bay municipality, South Africa: *A health promotion and disease prevention perspective*. PLoS ONE 16(11): e0259884. <https://doi.org/10.1371/journal.pone.0259884>

Editor: Michelle Lee D'Abundo, Seton Hall University, UNITED STATES

Received: March 7, 2021

Accepted: October 28, 2021

Published: November 24, 2021

Peer Review History: PLOS recognizes the benefits of transparency in the peer review process; therefore, we enable the publication of all of the content of peer review and author responses alongside final, published articles. The editorial history of this article is available here: <https://doi.org/10.1371/journal.pone.0259884>

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Data Availability Statement: All relevant data are within the paper and its [Supporting Information](#) files.

Abstract

Background

Healthcare professionals (HCPs) play a pivotal role in ensuring access to quality healthcare of patients. However, their role in health promotion (HP) and disease prevention (DP) has not been fully explored. This study aimed at determining how training, attitude, and practice (TAP) of HCPs influence their practice of HP and DP.

Methods

Data on TAP regarding HP and DP were collected from 495 HCPs from twenty-three hospitals in the study area using a standardized questionnaire. Bivariate, univariate, and multivariate analyses were conducted to describe how the TAP of HCPs influence their HP and DP practices. The analysis was further desegregated at the three levels of healthcare (primary, secondary and tertiary levels).

Results

Most of the medical doctors 36.12% (n = 173), registered nurses 28.39% (n = 136), and allied health professionals (AHPs) 11.27% (n = 54) indicated the absence of coordinated HP training for staff in their facilities. Similarly, 32.93% (n = 193) of the HCPs, indicated having participated in HP or DP training. Among those that had participated in HP and DP training, benefits of training were positive behaviour, attributions, and emotional responses. When compared at the different levels of healthcare, enhanced staff satisfaction and continuing professional development for HP were statistically significant only at the tertiary healthcare level. Multivariate analysis showed a likelihood of reduced coordinated HP training for staff among medical doctors (Coef 0.15; 95% CI 0.07–0.32) and AHPs (Coef 0.24; 95% CI 0.10–0.59) compared to nurses. Furthermore, medical doctors (Coeff: 0.66; 95% CI: 0.46–0.94)

Funding: The author(s) received no specific funding for this work.

Competing interests: The authors have declared that no competing interests exist.

were less likely to agree that HCPs should model good health behavior to render HP services as compared to nurses.

Conclusion

Training in HP and DP empowers HCPs with the requisite knowledge and attitude necessary for effective practice. Several HCPs at different levels of care had limited knowledge of HP and DP because of inadequate training. We recommend a strategy aimed at addressing the knowledge and attitudinal gaps of HCPs to ensure effective HP and DP services to patients.

Introduction

Despite increasing awareness on HP and DP, their integration into healthcare practice remains a persistent challenge. Globally, mortality and morbidity from preventable and lifestyle-related diseases continue to rise. Every year, 41 million people die from non-communicable diseases (NCD) which is tantamount to 71% of all deaths worldwide [1]. According to the World Health Organization (WHO), alcohol and tobacco abuse, physical inactivity and unwholesome diets are risk factors for NCD-related deaths [1]. Health screening, detection, and care form core response components to NCD. In 2019, there were 869 770 cases of measles and 207 500 deaths [2]. These deaths accounted for a 50% rise in four years [2]. Between 2017 and 2018, in the United States of America, the prevalence of adult obesity across both sexes was shown to be 42% [3]. Obesity poses a serious barrier to the prevention of chronic diseases globally [4]. Focus on the impact of HP and DP especially concerning physical activity and diet in alleviating the risk of obesity have gained more attention as no less than 2.8 million people die annually from either overweight or obesity [5]. In China, available data reveal that obesity is an independent and adjustable risk factor for diabetes mellitus [6]. A strong association has been demonstrated between obesity and hypertension [7, 8], coronary heart diseases [9, 10], atherosclerosis, and sudden cardiac death [10].

While the performance of routine clinical duties such as diagnosis, screening, patient care, and treatment are easily achieved by HCPs, the awareness [11], training, attitude, confidence, and consensus required to render HP and DP services are lacking. Several multifaceted impediments have been associated with poor or incoherence of HP and DP practice among HCPs. Evidence from the United Kingdom reveals that although HCPs are committed to delivering HP and DP services, they are limited by a lack of relevant training, inadequate resources, and time constraints [12]. In Ethiopia, limited training in HP negatively impacted the knowledge base of HCPs resulting in unsafe practices [13].

Categorized as an upper-middle-income nation, South Africa has high levels of unemployment and poverty [14]. In South Africa, morbidity and mortalities resulting from preventable and lifestyle modifiable diseases continue to soar. For three years (2015–2017), five out of ten leading causes of natural death in South Africa included tuberculosis, diabetes mellitus, human immunodeficiency (HIV) disease, hypertensive diseases, and ischemic heart diseases [15]; all of which can be prevented or controlled by adopting HP and DP practices. In an evaluation of risk factors that contribute to combined highest morbidity and disability, the Institute for Health Metrics and Evaluation showed that unsafe sex and malnutrition are the greatest contributors. Both risk factors contributed -41.6% and -33.5% change between 2009 and 2019 [16].

For HCPs to adequately meet the practice challenges posed by preventable and lifestyle modifiable diseases, there is need for institutionalized HP and DP training as well as the right attitudes. Available evidence shows that nurses [17] and physicians [18] who personally engage in HP and DP practices are more inclined to encourage their patients to act accordingly. Attitudes are of vital importance in health practice; they are an indicator of how HCPs perceive matters and reach a decision on what they consider appropriate.

Rationale

Urgent intervention through implementation of HP and DP practices by HCPs is needed to halt the progression of morbidity and mortality due to many preventable diseases in South Africa. The feasibility of hospital-centered HP and DP services to patients is well documented [11, 18–21]. McMahon and Connolly recommended collaboration among disciplines to improve health through HP [22]. However, HCPs who engage in HP and DP practices do so in professional silos [17, 23] with no coordination.

The NMBM is the largest city in the Eastern Cape Province and a major economic player both for the province and South Africa as a whole [24]. Like the rest of South Africa, the municipality's healthcare system has all three levels of care comprising primary, secondary, and tertiary healthcare services. Despite the availability of inexpensive measures such as dietary counselling, physical activity, and handwashing for HP and DP, HCPs do not have structured training and knowledge to effectively implement the measures [13]. Furthermore, there is limited evidence on the HP and DP training and attitudes of HCPs concerning HP and DP especially in resource-constrained settings [25, 26]. Based on the literature review for this project, no baseline study has been conducted to both identify and address the gap in the municipality. It is therefore important to evaluate how HP and DP training and attitudes influence HCPs' practice to develop appropriate interventions. Thus, the purpose of this cross-sectional study was to determine the impact of HCPs' training and attitudes on their HP and DP practices and to compare the impact at various healthcare levels.

Materials and methods

Study setting

This study was conducted in the Nelson Mandela Bay Municipality (NMBM) of South Africa. For ease of primary healthcare delivery, the South African health system is decentralized into District Health Systems. While the national department of health is responsible for the policy mandate of the health system, health services provided at district levels are managed by the respective provincial health departments. The NMBM health district is divided into three sub-districts—A, B, and C with a total of 53 public primary healthcare facilities distributed across the three sub-districts.

The municipality has one secondary and three tertiary hospitals. The tertiary hospitals focus on clinical specialties separate from each other. The health system is two-pronged: public and private. While the private is mostly used by patients on medical aid and those that can pay for healthcare, the public system provides free services. The municipality has an estimated 3500 healthcare professionals [27] serving a population of about 1.24 million [24], with the majority depending on the free public health system.

Study design and sample

This quantitative cross-sectional study was carried out among 520 HCPs that were randomly sampled from 23 hospitals in the NMBM. Only 501 HCPs completed the survey. Of the 501

respondents, six HCPs did not include their professions and were excluded from analysis. A total of 495 HCPs were included in the final analysis. An initial sample size of 384 was reached using a confidence level of 95% and an error margin of 5%. This sample size was further adjusted by 25% to 480 to account for non-responding HCPs. The hospitals included primary, secondary, and tertiary levels. The healthcare professionals and hospitals were randomly selected. Our sampling focused on HCPs that consult with patients in their hospitals. The study was carried out between January and March 2020. Gatekeepers of all sampled hospitals were formally notified in detail about the study. Their permissions were received before commencement. Our analysis was restricted to HCPs who consented to participate in the study.

Study tool and data collection

A standardized questionnaire adapted from a previously validated study [23] was developed to determine the influence of HCPs' training and attitude on their practice of HP and DP. The questionnaire was further subjected to a pilot test. The questionnaire (provided as [S1 File](#)) was divided into three sections. Section one explored the demographics of the respondents (sex, registration status with the relevant professional board, profession, and level of hospital in which the respondent practices—primary, secondary, or tertiary). A primary-level hospital refers to a healthcare facility where ambulatory or first-contact personal health care services are provided [28] and in this context includes the Primary Healthcare Centres (PHC), community clinics, Comprehensive Health Centers (CHC), and Midwife Obstetrics units (MOU). A secondary-level hospital refers to a healthcare facility that is highly differentiated by function with five to ten clinical specialties [29]. This level of facility includes the Regional Hospitals, Provincial Hospitals, and General Hospitals. The inpatient bed capacity ranges from 200 to 800. Tertiary-level hospitals on the other hand are hospitals with highly specialized professionals and facilities such as cardiology, intensive care unit, and specialized imaging infrastructures among others [29]. The clinical services of the tertiary healthcare facilities are highly differentiated by function and have an inpatient bed capacity of 300 to 1500. This level of hospitals includes National Hospitals, Central Hospitals, and Academic, or teaching or University Hospitals.

The second section assessed institutional training structure in place as well as individual training efforts on HP and DP (e.g., availability of coordinated HP training for staff, continuing professional development for health promotion in the hospital, respondent's participation in HP training, benefits of HP training such as improved knowledge, improved skills, enhanced confidence, enhanced staff satisfaction, increased support to patients, positive staff behavior, attributions and emotional responses, and no added benefit). The third section assessed HCPs' attitudes towards HP and DP using eight questions related to their views of HP and DP within the healthcare system.

Responses of study participants were measured using the 5-point Likert scale (1 = strongly disagree to 5 = strongly agree) and categorical responses ('Yes', 'No' or 'I don't know'). Data collection was done using a pre-tested, paper-based questionnaire administered by postgraduate and nursing students who were trained on the data collection process, questionnaire contents, and ethical issues by the principal investigator (PI). Data was collected between January and March 2020.

Ethical consideration

The Biomedical Research Ethics committee (BREC) of the University of KwaZulu Natal and the Eastern Cape Health Research committee approved the study protocol. Informed written

consent was received from each participant before commencement. Consenting participants were then enrolled in the study.

Statistical analysis

Data summary tables were done using Microsoft Excel and statistical analysis was done using Stata. Univariate, bivariate, and multivariate analyses were used to compare HP and DP training, attitudes, and practices among the medical doctors, registered nurses, and allied health professionals (AHPs). Pearson Chi-square test was used to determine the association between categorical variables. Because data were collected from the healthcare facility levels (Primary, Secondary, and Tertiary Healthcare), our analysis controlled for healthcare level to determine the type of training, attitude, and practice that influenced HCPs stationed at different levels of healthcare. Multinomial logistic regression was used to determine the influence of training, attitude, and practice on HCPs.

Results

Socio-demographic characteristics

The response rate for this study was 95%, ($n = 495$). The majority of the HCPs (70.46%; $n = 353$) worked at tertiary hospitals, followed by HCPs at the primary hospitals (26.15%; $n = 131$). Healthcare professionals working at the secondary hospitals were the least (3.39%; $n = 17$). Participating healthcare professionals included medical doctors (38.79%; 192), registered nurses (47.27%; $n = 234$), and AHPs (13.94%; $n = 69$). The AHPs comprised social workers, speech therapists, occupational therapists, dietitians, and physiotherapists.

Training in health promotion and disease prevention

Sixty-five (13.63%) medical doctors, 92 (19.29%) nurses, and 36 (7.55%) AHPs had been trained in HP. A significant association between the three groups of HCPs (Medical doctors, registered nurses, and allied health professionals) and the presence of coordinated HP and DP training for staff, previous participation in HP training, and availability of HP and DP related continuing professional development (CPD) programmes was noted (Table 1). Positive staff behavior, attributions, and emotional responses were found to be derived benefits of HP training. The associations between HP and HCPs are shown in Table 1.

Comparison of HP and DP training and attitude of HCPs at the various levels of healthcare

Comparison of HP and DP training; and attitude of HCPs at primary, secondary and tertiary levels (Table 2) showed significant associations between HCPs at the tertiary healthcare level for the following variables: coordinated HP and DP training, previous participation in HP and DP training, and continuing HP and DP related professional development. No significant associations were found at both the primary and secondary levels. Associated training benefits with HCPs working at the tertiary healthcare levels included positive staff behavior, attributions, and emotional responses. Enhanced staff satisfaction was an additional training benefit associated with HCPs at the tertiary healthcare levels. No HP or DP training benefit was significantly associated with HCPs at the primary and secondary healthcare levels.

Multivariate analysis showed that the risk of coordinated HP training for medical doctors (Coef 0.14; 95% CI 0.06–0.32) and AHPs (Coef 0.24; 95% CI 0.09–0.63) were both reduced compared to nurses. The presence of positive staff behavior, attributions, and emotional responses for AHPs (Coef 0.10.; CI 0.03–0.36) was equally lower than for nurses. No statistical

Table 1. Bivariate analysis of training in health promotion and among the different healthcare professional groups.

Training in HP	Responses	Healthcare professionals (%)			p-value
		Medical doctors	Registered Nurses	AHPs	
Is there a coordinated HP training for staff?	No	36.12% (n = 173)	28.39% (n = 136)	11.27% (n = 54)	0.000
	Yes	3.55% (n = 17)	17.54% (n = 84)	3.13% (n = 15)	
Have you ever participated in any HP training?	No	25.99% (n = 124)	27.04% (n = 129)	6.50% (n = 31)	0.019
	Yes	13.63% (n = 65)	19.29% (n = 92)	7.55% (n = 36)	
Benefits of training					
Improved knowledge	No	27.55% (n = 54)	44.90% (n = 88)	15.82% (n = 31)	0.733
	Yes	5.49% (n = 9)	5.10% (n = 10)	2.04% (n = 4)	
Improved skills	No	8.67% (n = 17)	8.67% (n = 17)	6.12% (n = 12)	0.093
	Yes	23.47% (n = 46)	41.33% (n = 81)	11.73% (n = 23)	
Enhanced confidence	No	10.77% (n = 21)	14.36% (n = 28)	8.21% (n = 16)	0.193
	Yes	21.54% (n = 42)	35.38% (n = 69)	9.74% (n = 19)	
Positive staff behavior, attributions, and emotional responses	No	16.84% (n = 33)	20.92% (n = 41)	14.29% (n = 28)	0.001
	Yes	15.01% (n = 30)	29.08% (n = 57)	3.57% (n = 7)	
Enhanced staff satisfaction	No	21.94% (n = 43)	28.57% (n = 56)	13.78% (n = 27)	0.077
	Yes	10.20% (n = 20)	21.43% (n = 42)	4.08% (n = 8)	
Increased support to patients	No	19.39% (n = 38)	34.69% (n = 68)	9.69% (n = 19)	0.220
	Yes	12.76% (n = 25)	10.20% (n = 20)	8.16% (n = 16)	
Enhanced staff retention	No	25.00% (n = 49)	36.22% (n = 71)	14.29% (n = 28)	0.591
	Yes	7.14% (n = 14)	13.78% (n = 27)	3.57% (n = 7)	
No added benefit	No	31.63% (n = 62)	48.47% (n = 95)	16.33% (n = 32)	0.189
	Yes	0.51% (n = 1)	1.53% (n = 3)	1.53% (n = 3)	
Is there a continuing professional development for health promotion in your facility	No	13.29% (n = 63)	11.39% (n = 54)	3.38% (n = 16)	0.000
	Yes	5.27% (n = 25)	23.84% (n = 113)	3.38% (n = 16)	
	I don't know	21.10% (n = 100)	11.18% (n = 53)	7.17% (n = 34)	

<https://doi.org/10.1371/journal.pone.0259884.t001>

difference was observed for staff participation in training, improved knowledge, improved skills, enhanced confidence, and staff satisfaction.

In the final model (Table 3), there was a likelihood of reduced coordinated HP training for staff among medical doctors (Coef 0.15; 95% CI 0.07–0.32) and AHPs (Coef 0.24; 95% CI 0.10–0.59) compared to nurses. Furthermore, the likelihood of positive staff behavior, attributions, and emotional responses for AHPs (Coef 0.17; 95% CI 0.07–0.45) was lower compared to nurses.

Attitudes towards health promotion and disease prevention

Analysis of HCPs' attitudes towards HP and DP showed that most of the HC professionals (98.72%; n = 462) expressed that it was important to participate in HP and DP. In addition, 21.02% (n = 103) of the medical doctors and 21.02% (n = 103) of the registered nurses, disagreed that patients did not want health education (HE) from HCPs while among the AHPs, 6.73% (n = 33) disagreed that patients did not want HE from HCPs. Table 4 shows the association between the health care professional groups and attitudes towards health promotion variables.

Following a bivariate analysis comparing attitudes towards HP and the various HCP groups, five variables were found to be associated with HCPs practice: HCPs should model good health behavior to give HP advice; HCPs should be encouraged to engage in HP as part of government policy and healthcare services; patients who deliberately engage in an unhealthy lifestyle will not benefit from health promotion; health education, advise and counseling from HCPs could positively enhance patients' health; and I do not have time to implement HP.

Table 2. Bivariate analysis of HP and DP training and attitude of HCPs at different levels of healthcare.

HP Training	Responses	Primary Health Care level				Secondary Health Care level				Tertiary Health Care level			
		Medical doctors	Nurses	AHPs	<i>p</i> -value	Medical doctors	Nurses	AHPs	<i>p</i> -value	Medical doctors	Nurses	AHPs	<i>P</i> -value
Is there a coordinated HP training for staff?	No	3.20% (n = 4)	52.00% (n = 65)	4.00% (n = 5)	0.976	37.50% (n = 6)	6.25% (n = 1)	31.25% (n = 5)	0.90	48.22% (n = 163)	20.71% (n = 70)	4.14% (n = 14)	0.000
	Yes	2.40% (n = 3)	36.00% (n = 45)	2.40% (n = 3)		0.00% (n = 0)	12.50% (n = 2)	12.50% (n = 2)		4.14% (n = 14)	10.95% (n = 37)	2.96% (n = 10)	
Have you ever participated in any HP training?	No	3.20% (n = 4)	44.80% (n = 56)	4.80% (n = 6)	0.408	31.25% (n = 5)	12.50% (n = 2)	31.25% (n = 5)	0.827	34.23% (n = 115)	21.13% (n = 71)	5.95% (n = 20)	0.001
	Yes	2.40% (n = 3)	43.20% (n = 54)	1.60% (n = 2)		6.25% (n = 1)	6.25% (n = 1)	12.50% (n = 2)		18.15% (n = 61)	11.01% (n = 37)	9.52% (n = 32)	
Benefits of training													
Improved knowledge	No	4.76% (n = 3)	80.95% (n = 51)	1.59% (n = 1)	0.700	25.00% (n = 1)	25.00% (n = 1)	50.00% (n = 2)		38.76% (n = 50)	27.91% (n = 36)	21.71% (n = 28)	0.645
	Yes	1.59% (n = 1)	11.11% (n = 7)	0.00% (n = 0)		0.00% (n = 0)	0.00% (n = 0)	0.00% (n = 0)		6.20% (n = 8)	2.33% (n = 3)	3.10% (n = 4)	
Improved skills	No	0.00% (n = 0)	17.46% (n = 11)	1.59% (n = 1)	0.075	0.00% (n = 0)	25.00% (n = 1)	25.00% (n = 1)	0.368	13.18% (n = 17)	3.88% (n = 5)	7.75% (n = 10)	0.114
	Yes	6.35% (n = 4)	74.60% (n = 47)	0.00% (n = 0)		25.00% (n = 1)	0.00% (n = 0)	25.00% (n = 1)		31.78% (n = 41)	26.36% (n = 34)	17.05% (n = 22)	
Enhanced confidence	No	1.59% (n = 1)	25.40% (n = 16)	1.59% (n = 1)	0.279	0.00% (n = 0)	25.00% (n = 1)	50.00% (n = 2)	0.135	15.63% (n = 20)	8.59% (n = 11)	10.16% (n = 13)	0.591
	Yes	4.76% (n = 3)	66.67% (n = 42)	0.00% (n = 0)		25.00% (n = 1)	0.00% (n = 0)	0.00% (n = 0)		29.69% (n = 38)	21.09% (n = 27)	14.84% (n = 19)	
Positive staff behavior, attributions and emotional responses	No	4.76% (n = 3)	38.10% (n = 24)	1.59% (n = 1)	0.225	0.00% (n = 0)	0.00% (n = 0)	50.00% (n = 2)	0.135	23.26% (n = 30)	13.17% (n = 17)	19.38% (n = 25)	0.010
	Yes	1.59% (n = 1)	53.97% (n = 34)	0.00% (n = 0)		25.00% (n = 1)	25.00% (n = 1)	0.00% (n = 0)		21.71% (n = 28)	17.05% (n = 22)	5.43% (n = 7)	
Enhanced staff satisfaction	No	4.76% (n = 3)	57.14% (n = 36)	1.59% (n = 1)	0.652	0.00% (n = 0)	25.00% (n = 1)	50.00% (n = 2)	0.135	31.01% (n = 40)	14.73% (n = 19)	18.60% (n = 24)	0.043
	Yes	1.59% (n = 1)	34.92% (n = 22)	0.00% (n = 0)		25.00% (n = 1)	0.00% (n = 0)	0.00% (n = 0)		13.95% (n = 18)	15.50% (n = 20)	6.20% (n = 8)	
increased support to patients	No	1.59% (n = 1)	61.90% (n = 39)	1.59% (n = 1)	0.175	25.00% (n = 1)	25.00% (n = 1)	25.00% (n = 1)	0.513	27.91% (n = 36)	21.70% (n = 28)	13.18% (n = 17)	0.266
	Yes	4.76% (n = 3)	30.16% (n = 19)	0.00% (n = 0)		0.00% (n = 0)	0.00% (n = 0)	25.00% (n = 1)		17.05% (n = 22)	8.53% (n = 11)	11.63% (n = 15)	
Enhanced staff retention	No	4.76% (n = 3)	65.08% (n = 41)	1.59% (n = 1)	0.802	0.00% (n = 0)	25.00% (n = 1)	50.00% (n = 2)	0.135	35.66% (n = 46)	22.48% (n = 29)	19.38% (n = 25)	0.845
	Yes	1.59% (n = 1)	26.98% (n = 17)	0.00% (n = 0)		25.00% (n = 1)	0.00% (n = 0)	0.00% (n = 0)		9.30% (n = 12)	7.75% (n = 10)	5.43% (n = 7)	
No added benefit	No	6.35% (n = 4)	88.89% (n = 56)	1.59% (n = 1)	0.915	25.00% (n = 1)	25.00% (n = 1)	50.00% (n = 2)		44.19% (n = 57)	29.46% (n = 38)	22.48% (n = 29)	0.174
	Yes	0.00% (n = 0)	3.17% (n = 2)	0.00% (n = 0)		0.00% (n = 0)	0.00% (n = 0)	0.00% (n = 0)		0.78% (n = 1)	0.78% (n = 1)	2.33% (n = 3)	
Is there a continuing professional development for health promotion in your facility	No	2.42% (n = 3)	27.42% (n = 34)	2.42% (n = 3)	0.738	18.75% (n = 3)	(n = 1)	12.50% (n = 2)	0.247	17.07% (n = 57)	5.69% (n = 19)	3.29% (n = 11)	0.000
	Yes	1.61% (n = 2)	39.52% (n = 49)	1.61% (n = 2)		0.00% (n = 0)	12.50% (n = 2)	18.75% (n = 3)		6.89% (n = 23)	18.56% (n = 62)	3.29% (n = 11)	
	I don't know	1.61% (n = 2)	20.97% (n = 26)	2.42% (n = 3)		18.75% (n = 3)	0.00% (n = 0)	12.50% (n = 2)		28.44% (n = 95)	8.08% (n = 27)	8.86% (n = 29)	

<https://doi.org/10.1371/journal.pone.0259884.t002>

Results from the multinomial logistic regression analysis (Table 5) showed that medical doctors (Coeff: 0.66; 95% CI: **0.46–0.94**) were less likely to agree that HCPs should model good health behavior to give HP advice compared to nurses. Furthermore, medical doctors (Coef 0.56; 95% CI 0.40–0.81) were less likely to view health promotion as a waste of time. In

Table 3. Multivariate analysis between HCP and HP training.

HP training	Healthcare Professions	Coef (unadjusted)	P value	95% CI	Coef (adjusted)	P value	95% CI
Is there a coordinated HP training for staff?	MD	0.14	0.000	0.61 0.32	0.15	0.000	0.07 0.32
	AHPs	0.25	0.006	0.09 0.67	0.24	0.002	0.10 0.59
Have you ever participated in any HP training?	Medical doctors	2.48	0.222	0.58 10.66	1.94	0.351	0.48 7.77
	AHPs	2.28	0.391	0.35 15.04	2.10	0.409	0.36 12.19
Improved knowledge	Medical doctors	0.52	0.303	0.15 1.82			
	AHPs	1.26	0.783	0.25 6.02			
Improved skills	Medical doctors	0.75	0.567	0.27 2.04			
	AHPs	0.52	0.268	0.17 1.65			
Enhanced confidence	Medical doctors	1.56	0.358	0.60 4.03			
	AHPs	1.37	0.568	0.46 4.08			
Positive staff behavior, attributions, and emotional responses	Medical doctors	0.68	0.417	0.27 1.73	0.63	0.197	0.31 1.27
	AHPs	0.11	0.002	0.03 0.45	0.17	0.000	0.07 0.45
Enhanced staff satisfaction	Medical doctors	0.67	0.44	0.24 1.85			
	AHPs	0.62	0.465	0.18 2.21			
increased support to patients	Medical doctors	0.69	0.407	0.29 1.64			
	AHPs	0.93	0.884	0.34 2.53			
Enhanced staff retention	Medical doctors	2.01	0.245	0.62 6.56	1.30	0.598	0.49 3.44
	AHPs	3.67	0.098	0.79 17.18	2.68	0.155	0.69 10.44
No added benefit	Medical doctors	0.37	0.472	0.24 5.61	0.49	0.601	0.04 6.94
	AHPs	4.21	0.230	0.44 40.57	4.30	0.197	0.47 39.56
Is there a continuing professional development for health promotion in your facility	Medical doctors	1.76	0.032	1.05 2.95	1.60	0.063	0.98 2.64
	AHPs	1.38	0.323	0.73 2.59	1.35	0.338	0.73 2.50

<https://doi.org/10.1371/journal.pone.0259884.t003>

addition, medical doctors (Coef 0.79; 95% CI 0.66–0.96) were less likely to view patients who deliberately engaged in an unhealthy lifestyle as benefitting from health promotion.

Discussion

Using data obtained from several hospitals in the Nelson Mandela Bay Municipality, we identified training and attitudinal factors among various healthcare professional groups (medical

Table 4. Bivariate analysis of attitudes towards health promotion and each healthcare professional group.

Attitudes towards HP	Responses	Healthcare workers by professions (%)			p-value
		Medical doctors	Nurses	AHPs	
HCW should model good health behavior in order to give HP advice	Strongly disagree	0.61% (n = 3)	0.61% (n = 3)	0.20% (n = 1)	0.001
	Disagree	1.43% (n = 7)	0.00% (n = 0)	0.20% (n = 1)	
	Neutral	4.50% (n = 22)	2.21% (n = 10)	1.43% (n = 7)	
	Agree	19.43% (n = 95)	19.43% (n = 95)	6.95% (n = 34)	
	Strongly agree	13.29% (n = 65)	24.74% (n = 121)	5.11% (n = 25)	
HCW should be encouraged to engage in HP as part of government policy and healthcare services	Strongly disagree	0.61% (n = 3)	0.61% (n = 3)	0.21% (n = 1)	0.008
	Disagree	0.82% (n = 4)	0.41% (n = 2)	0.21% (n = 1)	
	Neutral	5.93% (n = 29)	2.25% (n = 11)	14.31% (n = 7)	
	Agree	18.20% (n = 89)	19.83% (n = 97)	7.16% (n = 35)	
	Strongly agree	13.70% (n = 67)	23.72% (n = 116)	4.90% (n = 24)	
Health promotion is a waste of time	Strongly disagree	6.64% (n = 32)	31.74% (n = 153)	11.20% (n = 54)	0.358
	Disagree	10.17% (n = 49)	11.20% (n = 54)	2.28% (n = 11)	
	Neutral	1.24% (n = 6)	1.25% (n = 6)	0.21% (n = 1)	
	Agree	0.42% (n = 2)	1.45% (n = 7)	0.42% (n = 2)	
	Strongly agree	0.00% (n = 0)	0.83% (n = 4)	0.21% (n = 1)	
Patients who deliberately engage in an unhealthy lifestyle will not benefit from health promotion	Strongly disagree	12.32% (n = 60)	13.96% (n = 68)	3.90% (n = 19)	0.002
	Disagree	16.02% (n = 78)	13.37% (n = 65)	5.96% (n = 29)	
	Neutral	4.92% (n = 24)	3.49% (n = 17)	1.23% (n = 6)	
	Agree	4.52% (n = 22)	10.27% (n = 50)	1.43% (n = 7)	
	Strongly agree	1.62% (n = 8)	5.54% (n = 27)	1.43% (n = 7)	
Health education, advise and counseling from HCW could positively enhance patients' health	Strongly disagree	1.03% (n = 5)	1.23% (n = 6)	0.21% (n = 1)	0.042
	Disagree	0.82% (n = 4)	1.22% (n = 6)	0.21% (n = 1)	
	Neutral	1.43% (n = 7)	1.43% (n = 7)	0.41% (n = 2)	
	Agree	(n = 102)	(n = 82)	(n = 25)	
	Strongly agree	15.16% (n = 74)	25.82% (n = 126)	8.20% (n = 40)	
I do not have time to implement health promotion	Strongly disagree	4.49% (n = 22)	17.34% (n = 85)	3.67% (n = 18)	0.000
	Disagree	13.57% (n = 67)	20.41% (n = 100)	5.31% (n = 26)	
	Neutral	9.59% (n = 47)	4.08% (n = 20)	1.84% (n = 9)	
	Agree	8.98% (n = 44)	3.06% (n = 15)	2.45% (n = 12)	
	Strongly agree	2.24% (n = 11)	2.04% (n = 10)	0.82% (n = 4)	
Patients do not want health education from HCW	Strongly disagree	8.78% (n = 43)	13.27% (n = 65)	1.84% (n = 9)	0.129
	Disagree	21.02% (n = 103)	21.02% (n = 103)	6.73% (n = 33)	
	Neutral	5.51% (n = 27)	7.76% (n = 38)	3.47% (n = 17)	
	Agree	2.04% (n = 10)	3.47% (n = 17)	1.43% (n = 7)	
	Strongly agree	1.43% (n = 7)	1.63% (n = 8)	0.61% (n = 3)	
Do you think HCW should participate in HP?	No	0.21% (n = 1)	1.07% (n = 5)	0.00% (n = 0)	0.181
	yes	38.89% (n = 182)	45.51% (n = 213)	14.32% (n = 67)	

<https://doi.org/10.1371/journal.pone.0259884.t004>

Table 5. Multivariate analysis of attitudes towards health promotion.

Attitudes towards Hp and DP	Healthcare Professions	Coef (unadjusted)	P value	95% CI	Coef (adjusted)	P value	95% CI
HCPs should model good health behavior in order to give HP advice	MD	0.68	0.043	0.46 0.99	0.66	0.020	0.46 0.94
	AHPs	0.69	0.122	0.43 1.11	0.69	0.117	0.44 1.09
I do not have time to implement health promotion	Medical doctors	2.39	0.000	1.88 3.03	2.27	0.000	1.81 2.84
	AHPs	1.74	0.000	1.29 2.33	1.62	0.001	1.22 2.17
Patients do not want health education from HCPs	Medical doctors	0.86	0.280	0.66 1.13	0.93	0.592	0.73 1.20
	AHPs	1.43	0.023	1.05 1.95	1.40	0.026	1.04 1.88
Do you think HCPs should participate in HP?	Medical doctors	9.43	0.053	0.97 91.56			
	AHPs	0.13	0.985				
HCPs should be encouraged to engage in HP as part of government policy and healthcare services	Medical doctors	0.66	0.030	0.46 0.96	0.69	0.038	0.49 0.98
	AHPs	0.63	0.051	0.39 1.00	.74	0.180	0.48 1.15
Health promotion is a waste of time	Medical doctors	0.55	0.002	0.38 0.80	0.56	0.002	0.40 0.81
	AHPs	0.56	0.023	0.34 0.92	0.51	0.007	0.31 0.83
Patients who deliberately engage in an unhealthy lifestyle will not benefit from health promotion	Medical doctors	0.79	0.019	0.65 0.96	0.79	0.015	0.66 0.96
	AHPs	0.88	0.305	0.69 1.12	0.87	0.293	0.69 1.12
Health education, advise and counselling from HCW could positively enhance patients' health	Medical doctors	0.87	0.354	0.64 1.17			
	AHPs	1.42	0.141	0.89 2.27			

Registered Nurses as base outcome.

<https://doi.org/10.1371/journal.pone.0259884.t005>

doctors, allied health professionals, and nurses) that influence their practice of health promotion and disease prevention at the different levels of healthcare services. For each professional group, there were different determinants relating to their practice of HP and DP that require different mitigatory measures. Our results show a positive correlation between HCPs' attitudes towards HP and their practice. However, training infrastructures at the hospitals and HCPs participation in HP and DP training were low.

Training

Seventy five point seven eight percent (75.78%; n = 363) of participants indicated that there was no coordinated HP training for healthcare professionals at their hospitals. This was consistent with the findings of Cancedda et al 2015 [30]. This may signify that the relevance of adequate HP training for healthcare professionals is being ignored. Such an omission may seriously impact the quality of HP services or outrightly neglect it and may also result in the demoralization of professionals and the ability of the hospitals to retain good health professionals. Possible reasons for poor coordinated training may include difficulties in initiating such programs, wide-ranging negotiations with leadership, lack of resources and knowledge or

processes necessary for program initiation [30]. Health promotion and DP objectives such as promotion of a healthy lifestyle, prompt detection, and monitoring of disease can be achieved through coordinated training of healthcare workers. Such training should aim at equipping HCPs with the requisite skills to empower the population on living healthy [31].

Most of our study respondents had never participated in any HP or DP training. Despite the overall limited training of all health professionals, the AHPs reported greater participation in HP and DP training compared to medical doctors and nurses. Multivariate analysis further revealed that the AHPs were 2.10 times more involved in HP and DP training than the nurses. This compares well to previous studies which showed above 70% positive responses to training and knowledge in health promotion among physiotherapists [32, 33]. The low participation of medical doctors and registered nurses in HP and DP training in the present study may reflect their limited participation in HP and DP practice in general. A precise comparison of the training results from this study to others may prove challenging as a result of variation in the sample population (most studies explored KAP in a specific health care profession) [23, 34, 35]. The positive staff behavior, attributions, and emotional responses among AHPs could be explained by their greater participation in relevant training [36].

In addition to coordinated HP training, previous participation in HP training, and CPD, the study revealed a further statistically significant association between two training benefits (enhanced staff satisfaction and positive behavior) and HCPs at the tertiary hospitals only. This finding could not be compared to any other study as there were no other studies comparing TAP of HP and DP at the various levels of healthcare facilities found during the literature search for this study.

Attitudes

Consistent with existing literature [37–39], our analysis revealed an overall acceptance that HCPs should serve as role models of good health behaviors before offering such services to patients. Health promotion and disease prevention strategies like physical fitness and good nutrition positively influenced HCPs' health and wellbeing, as well as their HP and DP practice [40]. It follows, therefore, that efforts towards increasing the knowledge of HCPs' lifestyle and detection of possible limitations to their lifestyle changes such as requisite stimuli, may be essential elements in the pursuit of HP and DP of the general population. After controlling for the attitudinal variables at the different levels of healthcare, our findings indicated that HCPs serving as role models for good health behavior influence the practice of HCPs at the primary healthcare levels compared to those at the secondary and tertiary healthcare levels. This may be related to the traditional intentions for Primary Healthcare Centers (PHC) that focus on population needs along the continuum from HP and DP [28]. Past studies [41, 42] in South Africa reported overstretching of public healthcare facilities at all levels leading to a spillover of patients meant for primary levels of care to both secondary and tertiary levels. The impact of this spillover threatens the quality of healthcare at all levels, with HCPs at secondary and tertiary levels not adequately prepared to meet the HP and DP needs of patients who are still part of the general population. Thus, interventions targeting HP and DP for HCPs at all levels of care are a necessary investment for healthcare systems.

In our study, only 38.03% ($n = 132$) of HCPs ($p < 0.001$) at the tertiary hospitals agreed to having adequate time for HP and DP. Similarly, in a Dutch study [43], general practitioners, and practice nurses reported lack of time as a reason for not partaking in health promotion practices. The lack of time may be attributed to practice-related issues [43] and a high volume of patients. Our study further showed that among medical doctors, patients that continually live unhealthy lifestyle constituted a barrier to HP and DP. This finding corroborates with the study of Geense et al [43] which showed that some patients often lie about their true lifestyle.

Our study further identified that Patients not wanting health education from healthcare professionals emerged as an influencing variable among AHPs for HP and DP practice. HCPs are continually challenged to ensure that relevant information is communicated to patients to make an informed decision. Failure to receive this information may in part be attributed to patients' low level of health literacy [43]. Poor health literacy level negatively affects patient outcomes, and this unfortunately is often unrecognized. In many instances, patients are ashamed to notify the HCP that they either cannot read or comprehend information handed to them. The study of Veenker et al 2016 [44] recommended the use of scaffolding by a health practitioner in building an autonomy spiral. Such practice helps both players (HCP and patient) in building a long-term dynamic partnership of learning [44]. Other possible explanations for patients rejecting HE from HCPs include language barriers and cultural reasons. The realization of the consequences of patients not wanting HE from HCPs opens a window of opportunity to better understand the reasons for untoward outcomes and develop appropriate interventions to address them.

Patients who deliberately engage in an unhealthy lifestyle will not benefit from health promotion was one independent attitude predictor among medical doctors (adjusted Coef 0.79; 95% CI 0.66–0.96). This relationship may create an opportunity to developing patients' health literacy and participation through health promotion. Medical doctors will need to invest time and resources to actualize behavioral change that results in better population health outcomes. The medical doctor-patient relationship necessitates a dual obligation in which the medical doctor advises the patient on the process to reach his/her health goals, and the patient must comply with the information provided [45] for the best outcome.

Strengths and limitations

Based on the literature review for this project, no previously published study has investigated the influence of training and attitudes on HCPs' practice of HP and DP in the NMBM. Also, the authors are not aware of any study that has compared the TAP of HCPs practice of HP and DP at the three levels of healthcare (primary, secondary, and tertiary levels). By fitting with the multinomial logistic regression model, we were able to reduce standard errors when compared to binary logistic regression used in previous studies.

Our study limitations include the possibility of information bias emanating from HCPs' self-reporting of information. The risk of recall bias or poor memory resulting in over or under-reporting of available training infrastructure abound. The confinement of the study to only one South African Province as well as the non-inclusion of HCPs in the private sector limits generalization of the study results. Some provinces have more fiscal capacity than others, and such provinces would most likely make more investment in healthcare delivery than the resource-depleted ones. Similarly, a wide gap exists between the private and public healthcare systems in South Africa. The two sectors are divided along socioeconomic lines. Unlike the public health sector that is government-funded, the private health sector is funded by individuals buying into expensive medical aid schemes, making the sector centers of quality care, better infrastructure, and relatively sufficient resources. Hence the situation between private and public hospitals is different, making it difficult to directly apply findings of our study to the private sector. The study was cross-sectional and therefore did not allow causal inferences.

Recommendations

Our recommendations include expansion of training curriculum of tertiary institutions to cover a significant amount of HP and DP courses. Also, emphasis should be placed on in-service training of healthcare professionals on HP and DP continuously. A robust and

enthusiastic engagement between healthcare professionals and patients is needed for the realization of effective HP and DP interventions. Finally, HCPs should be encouraged to model good health and lifestyle practices before advising patients.

Conclusion

This study provides an understanding of the impact of training and attitudes to healthcare professionals' practice of health promotion and disease prevention in the Nelson Mandela Bay Municipality of South Africa. Our findings show that HCPs in the NMBM have a positive attitude towards HP and DP but their training in these fields limits them to effectively practice. More nurses than medical doctors and allied health professionals reportedly had positive behavior, attribution, and emotional responses and this may be associated with the HP and DP training this set of nurses may have received.

The major impediments to training reported by the HCPs included a lack of training infrastructure in healthcare facilities. When controlled at the facility levels, the tertiary health facilities were the neediest of all three, with medical doctors and nurses at this level needing more training than the AHPs in HP and DP. The findings suggest the need for establishing HP and DP training programs in healthcare facilities, especially in those where HCPs reported limited training to fill the knowledge and attitudinal gaps. This study further suggests that training should be tailored to meet each healthcare professionals' need as these vary with each professional group.

The content and knowledge of this study may serve as a guide to health systems' managers and political leaders in the planning and implementation of relevant programs aimed at improving population health. Future observational studies to validate the self-reported data retrieved from HCPs should be considered.

Supporting information

S1 File. Questionnaire.

(DOCX)

S2 File. Dataset.

(XLSX)

Acknowledgments

We would like to thank all healthcare professionals who agreed to participate in this study. In addition, we are grateful to the Eastern Cape Department of Health, the Nelson Mandela Bay Municipality District Health, all tertiary, secondary, and primary healthcare facilities in the NMBM for granting us access to their institutions.

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Phase one study ended with chapter four which examined the HP training, attitude, and practice of HCWs. Findings from that chapter showed that while HCWs displayed good attitude towards HP, however their practice is hampered by inadequate training. Chapter five addresses the objective in the second phase (fifth objective) which focused on patients' view of HP services received from HCWs.

Chapter 5

Patients' views on health promotion and disease prevention services provided by healthcare workers in a South African tertiary hospital

Herbert I. Melariri¹, Chester Kalinda, Moses J. Chimbari, 2022. Patients' views on health promotion and disease prevention services provided by healthcare workers in a South African tertiary hospital

(Accepted for publication by BMC Health Services Research)

Patients' views on health promotion and disease prevention services provided by healthcare workers in a South African tertiary hospital

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Abstract

Background: Patients' views and experiences in healthcare institutions provide a means of assessing the quality of services patients receive from healthcare workers (HCWs). However, the views of patients on the health promotion (HP) and disease prevention (DP) services offered by HCWs and the delivery mode have not been adequately studied.

Aim: This study assessed the views of patients on HP and DP services provided by various categories of HCWs.

Setting: The study was conducted at a tertiary hospital in the Nelson Mandela Bay Municipality, South Africa.

Method: An exploratory cross-sectional study was conducted among 500 patients. The questionnaire elicited responses from patients regarding the HP and DP services received from the different cadres of HCWs at three different admission phases: pre-admission phase (PAP), admission phase (ADP), and post-admission phase (POP). Descriptive, bivariate, and multivariate analysis was conducted.

Results: In the PAP, most patients (83.33%, n=5; 87.85%, n=217; and 76.14%, n=150) seen by the rehabilitation health workers, medical doctors, and nurses respectively were empowered to manage their health. Patients attended to by nurses were 0.45 (95% CI 0.27-0.74) times less likely than those attended to by medical doctors to receive information that that will help them address the physical and environmental needs. In the ADP, patients attended to by nurses were less likely, compared to those attended to by medical doctors to be empowered to have good control over their health. In the POP, patients attended to by nurses are more likely to have their health behaviours change for better compared to those not seen by any HCW.

Conclusion: Patients attending tertiary hospital received greater HP and DP services during the PAP and ADP of patient care. Greatest influence for behavioural change of patients on HP and DP were achieved from the medical doctors, nurses and rehabilitation service staff. Improving structural factors may prove beneficial in enhancing patients' experience from all HCW groups and phases of patient care.

Keywords: Health Promotion, Disease prevention, Patients' views, Healthcare workers

Introduction

In addition to clinical services, patients receive HP and DP services (1,2) from HCWs within and outside the healthcare facilities. These HP and DP services have improved health outcomes among patients, reduced disease burden, boosted cost-effectiveness, and improved patients' experiences (3,4). Assessing patients' views and perceptions is a vital tool in understanding how well healthcare services are delivered and received (5–7) and help to identify practical ways to enhance service delivery.

Health promotion refers to the process of enabling people to increase control over, and to improve their health (8). Disease prevention on the other hand, describes measures to reduce the occurrence of risk factors, prevent the occurrence of disease, to arrest its progress and reduce its consequences once established (8). In South Africa, there is reduced coordinated HP and DP training for medical doctors compared to nurses (9).

Patients are key stakeholders in the healthcare system (10). With an increasing focus on the quality of services delivered to patients (11), they are now more knowledgeable of their health conditions (12–14), know their rights (15), and freely convey their expectations concerning various healthcare services rendered to them by HCWs (16). Previous studies have evaluated healthcare services in health institutions to measure, monitor and assess patients' views on the health care services received from HCWs, including medical doctors, nurses, and rehabilitation service staff (7,17). According to Berger et al (18), patient feedback is one of the major impact assessment indicators for service improvement and intervention. Berger et al (18) described three forms of patient feedback: voluntary events, patients

surveys, and informal feedback. In voluntary events, patients log complaints through available media such as customer portals, telephonic (19,20) or email communication (21), or social media platforms. The feedback can also be initiated by the institution through periodic surveys done telephonically or issued to patients to complete. Informally, patients can also give feedback to HCWs verbally.

Although the literature on patients' view of HP and DP services are limited, there is evidence suggesting that patients are distinctively positioned to guide HCWs on the quality of services they deliver. In the United States, most patients agreed that HCWs should be role models of behavioural change to them (22). In France, Pinar et al (23), while evaluating patient satisfaction during the COVID-19 pandemic suggested that patients who met their doctors for the first time were more likely to be satisfied. Reza et al (24) demonstrated in a satisfaction survey, that the waiting time of patients at different service arms of the clinics influenced their overall satisfaction. A study by Freeman et al (25) concluded that HP in South Africa, a country experiencing resource constraints affecting public healthcare service delivery, had great potentials to improve the cost-effectiveness of health outcomes. Although these authors assessed the views of HP practitioners, they did not assess the views of patients served. In addition, earlier studies focusing on HP or DP service assessments were conducted in countries with similar resource-constrained settings focusing on aspects such as nutrition promotion programs and promotion of physical activity in schools (26–28). However, there is a dearth of information on studies evaluating the views of patients on HP and DP services rendered by HCWs in sub-Saharan countries, including south Africa.

In recent years, tertiary hospitals in the Nelson Mandela Bay Municipality, South Africa have made some progress in HP and DP services to patients (29). However, this progress is restricted as individuals and specific HCW groups work in silos. To improve the quality of HP and DP services delivered to patients, the extent of services rendered by different HCW groups should be evaluated at this healthcare level with considerations of the views of patients. This study, therefore, was conducted to assess the views of patients regarding HP and DP services they received from HCWs.

Methods

Study design and sample

An exploratory cross-sectional study was conducted among patients referred to the outpatient and inpatient departments at a tertiary hospital in Nelson Mandela Bay Municipality, Eastern Cape Province in South Africa. The Nelson Mandela Bay Municipality is an important economic hub in South Africa as well as a reference in healthcare services. The hospital was selected as the setting of this study because it serves a catchment population of about 1.6 million, mainly from the Eastern Cape province.

The sample population comprised all adult outpatients and inpatients of the hospital. We did not include critically ill patients and patients in intensive care unit for ethical reasons. Including these patients would have increased their stress and probably made their conditions worse.

Participants were selected using a homogenous purposive sampling strategy (30). This strategy was used to include only patients that share the common characteristic of having been fully attended to by HCWs, either in the current or previous visits to the hospital. A total of 500 patients agreed to participate in the study by signing a written consent form. We purposively selected study participants because we wanted a sample size that was as large as possible. Since different patients were present on different days in the hospital, the study was conducted over three months to offer an equal chance for eligible participants to partake.

Survey Instrument

Data collection was achieved using a structured questionnaire herein referred to as Health Promotion Provision Assessment (HPPA) questionnaire. The major advantage of the HPPA is in its higher response rates as it is designed for easy response, while its main drawback is on the time taken by the fieldworkers to interview every participant.

The HPPA comprised two sections; section A had three items where the participants could indicate which HCW cadre offered certain HP and DP services while section B contained eight items focusing on patients' satisfaction and empowerment. The HCW cadres included medical doctors, nurses, rehabilitation health workers, dieticians, and social workers. The items in section B were measured on a four-point Likert scale ranging from 1 (strongly disagree) to 4 (strongly agree). Both sections have Cronbach's alpha of 0.777 and 0.783 respectively. Data collection was conducted between January to March 2020 by trained field workers. The field workers were graduate students.

Statistical analysis

Data was captured in Microsoft Excel 2016 and imported to StataIC 15 (Stata Statistical Software: Release 15. College Station, TX: StataCorp LLC) where data cleaning and analysis was done. Descriptive statistics were used to summarize the HP and DP services provided by different HCWs. Analysis was conducted for the three-tiered phase outcome measures comprising: pre-admission, admission, and post-admission. Pre-admission phase refers to the period of out-patient consultations and period before getting a bed in the hospital ward. Admission phase refers to the period in which patient is admitted in hospital and treated as in-patient. Post admission refers to period after a patient has been discharged from hospital and is at home. Associations between the outcome and predictor variables were assessed in a bivariate analysis using a Pearson chi-square test otherwise, a Fisher's test was done where the same frequencies were small. This was done with phase outcome measures (pre-

admission, admission, and post-admission). At the pre-admission phase, analysis focused on determining which HCW group properly attended to patients' HP and DP needs. During the admission phase, the HCW group that attended to the patients at this stage was considered as the predictor variables, while the HCW group that followed the health progress of patients after discharge was considered for the post-admission phase. Predictor variables associated with the response variable in the bivariate analysis were used in a multinomial regression model. The Hosmer & Lemeshow test was used in checking the models' goodness of fit (31).

All methods ensured adherence to the following guidelines and regulations: 1) Valid scientific design and conduct of the study were ensured; 2) Potential harms were prevented; 3) No participant was made to bear more than his/her fair share of the burden of participation in the study; 4) Protection of research participants' privacy and confidentiality was ensured; and 5) Participants were entitled to choose freely whether to participate in the research, and to make decisions based on an adequate understanding of what the study entails (51).

Results

Pre-Admission Phase (PAP)

In the pre-admission phase, significant associations between HP/DP practices and the different cadres of HCWs were identified on five out of eight variables under consideration (Table 1). Statistically significant variables included - information helping patients address their physical and environmental needs ($p<0.001$), patients' being empowered to manage their health ($p=0.001$), patients' satisfaction with HP services ($p=0.002$), patients' health behaviour changing for better ($p=0.027$), and patients being empowered to have good control over their health ($p=0.011$). A 100% response rate was recorded by patients who were educated by rehabilitation health workers on the importance of treatment compliance. When compared across the various HCW cadres, rehabilitation health workers empowered 83.33% of their patients to have control over their health, 87.85% by medical doctors, and 76.14% by nurses. Regarding influencing patients to change their health behaviour for better, 33.33% of patients were not attended to by the rehabilitation health workers; 20.24% were not attended to by the medical doctors; and 25.00% were not attended to by the nurses.

Table 1: Bivariate analysis between outcome variable (Attending HCW at Pre-Admission Phase) and predictor variables

Predictors	Responses	Attending HCW at pre-Admission Phase (PAP) (Frequency, %)				<i>p-value</i>
		Rehab	Doctors	Nurses	None	
Educated on importance of treatment compliance	Not attended	0	27(10.76%)	17(8.46%)	6(17.65%)	0.351*
	Attended to	6(100%)	224(89.24%)	184(91.54%)	28(82.35%)	
Educated on the benefits of physical exercise and fitness	Not attended	2(33.33%)	73(28.97%)	66(32.84%)	17(50%)	0.098*
	Attended to	4(66.67%)	179(71.03%)	135(67.16%)	17(50%)	
Received Information concerning preventable diseases	Not attended	3(50.00%)	135(53.78%)	99(49.25%)	19(55.88%)	0.750*
	Attended to	3(50.00%)	116(46.22%)	102(50.75%)	15(44.12%)	
Addressed physical and environmental needs	Not attended	1(16.67%)	42(16.80%)	65(32.66%)	14(42.42%)	0.000*
	Attended to	5(83.33%)	208(83.20%)	134(67.34%)	19(57.58%)	
Empowered to manage health	Not attended	1(16.67%)	30(12.15%)	47(23.86%)	11(34.38%)	0.001*
	Attended to	5(83.33%)	217(87.85%)	150(76.14%)	21(65.62%)	
Satisfied with HP services	Not attended	1(16.67%)	37(14.86%)	50(25.13%)	13(40.63%)	0.002*
	Attended to	5(83.33%)	212(85.14%)	149(74.87%)	19(59.37%)	
Health behaviour changed for better	Not attended	2(33.33%)	50(20.24%)	49(25.00%)	14(43.75%)	0.026*
	Attended to	4(66.67%)	197(79.76%)	147(75.00%)	18(56.25%)	
Good control over health	Not attended	2(33.33%)	32(12.96%)	35(17.77%)	11(34.38%)	0.011*
	Attended to	4(66.67%)	215(87.04%)	162(82.23%)	21(65.62%)	

*Fishers exact test was used because some frequencies were less than 10.

In the final model of the multinomial regression analysis, three HP/DP variables were significantly associated with nurses' practice, and none was identified for rehabilitation health workers (Table 2). The analysis showed that patients were 1.54 (95% CI: 1.03-2.30) times as likely to receive information about preventable diseases from nurses as they were from medical doctors. The results further showed that patients were 32% (RR: 0.68; 95% CI: 0.33-0.99) times less likely to be empowered by nurses than medical doctors to manage their health. In addition, the results also showed that patients were 64% (RR: 0.36; 95% CI: 0.14-0.88) and 61% (RR: 0.39; 95% CI: 0.16-0.97) less likely to be addressed on physical

and environmental needs and empowered to manage their health, respectively by none of the health workers compared to doctors.

Table 2: Multinomial regression model analysis relating HP and DP services and HCW groups in the PAP

Predictors	Relative Risk Ratio	p-value	95% Confidence Interval
Rehab			
Received Information concerning preventable diseases	1.12	0.887	0.21-5.98
Addressed physical and environmental needs	1.06	0.959	0.09-11.63
Empowered to manage health	0.67	0.738	0.07-6.92
Nurses			
Received Information concerning preventable diseases	1.54	0.035	1.03-2.30
Addressed physical and environmental needs	0.45	0.002	0.27-0.74
Empowered to manage health	0.68	0.047	0.33-0.99
None			
Received Information concerning preventable diseases	1.40	0.405	0.63-3.10
Addressed physical and environmental needs	0.36	0.026	0.14-0.88
Empowered to manage health	0.39	0.043	0.16-0.97

Doctors as Reference outcome

Admission Phase (ADP)

Bivariate analysis of the admission phase showed a 100% response from patients who were attended to by the dieticians (Table 3). The results shows that four out of the eight HP/DP variables were significantly associated with the various healthcare professional groups. The statistically significant variables elicited in this phase are – information addressing physical and environmental needs of patients ($p=0.045$), empowerment of patients to manage their health ($p=0.000$), patients health behaviour changed for better ($p<0.001$), and empowering patients to have good control over health ($p=0.000$). Regarding patients' empowerment to have good control over their health, the results show

that 100% of the dieticians' and rehabilitation health workers' patients were fully attended to. Eighty-six-point nineteen percent (86.19%) and 73.56% of patients seeing the medical doctors and nurses respectively were also empowered to have good control over their health.

Table 3: Bivariate analysis between outcome variable (Attending HCW at Admission Phase) and predictor variables

Predictors	Responses	Attending HCW at Admission Phase (ADP) (Frequency, %)					<i>p-value</i>
		Dieticians	Rehab	Doctors	Nurses	None	
Educated on importance of treatment compliance	Not attended	0	0	37(10.08%)	10(11.11%)	4(25.00%)	0.228*
	Attended to	11(100%)	12(100%)	330(89.92%)	80(88.89%)	12(75.00%)	
Educated on the benefits of physical exercise and fitness	Not attended	2(18.18%)	1(8.33%)	123(33.42%)	29(32.22%)	6(37.50%)	0.349*
	Attended to	9(81.2%)	11(91.67%)	245(66.58%)	61(67.78%)	10(62.50%)	
Received Information concerning preventable diseases	Not Attended	4(36.36%)	5(41.67%)	196(53.41%)	43(47.78%)	10(62.50%)	0.528*
	Attended to	7(63.64%)	7(58.33%)	171(46.59%)	47(52.22%)	6(37.50%)	
Addressed physical and environmental needs	Not attended	2(18.18%)	1(8.33%)	83(22.87%)	33(36.67%)	5(31.25%)	0.048*
	Attended to	9(81.82%)	11(91.67%)	280(77.13%)	57(63.33%)	11(68.75%)	
Empowered to manage health	Not attended	0	0	57(15.79%)	29(32.95%)	6(37.50%)	0.000*
	Attended to	9(100%)	12(100%)	304(84.21%)	59(67.05%)	10(62.50%)	
Satisfied with HP services	Not attended	1(9.09%)	2(16.67%)	67(18.51%)	24(26.97%)	7(43.75%)	0.060*

	Attended to	10(90.91%)	10(83.33%)	295(81.49%)	65(73.03%)	9(56.25%)	
Health behaviour changed for better	Not attended	0	0	82(22.71%)	21(24.14%)	13(81.25%)	0.000*
	Attended to	9(100%)	12(100%)	279(77.29%)	66(75.86%)	3(18.75%)	
Good control over health	Not attended	0	0	50(13.81%)	23(26.44%)	8(50.00%)	0.000*
	Attended to	9(100%)	12(100%)	312(86.19%)	64(73.56%)	8(50.00%)	

- Fishers exact test was used because some frequencies were less than 10.

The multivariate analysis of ADP (Table 4) revealed three statistically significant dimensions that were associated with the HCW group that attended to the patients. The analysis showed nurses were 57% (RR: 0.43; 95% CI: 0.24-0.78) and 54% (RR: 0.46; 95% CI: 0.22-0.95) less likely to empower patients to manage their health and take good control over health during admission, respectively compared to doctors. The result further showed that patients who were not attended to by any health worker were 0.09 (95% CI 0.02-0.37) less likely to change their health behaviour for better when compared to patients attended to by medical doctors.

Table 4: Multinomial regression model analysis relating HP and DP services and HCW groups in ADP

Predictors	Relative Risk Ratio	p-value	95% Confidence Interval
Dieticians			
Empowered to manage health	0.63	0.150	0.33-0.74
Health behaviour changed for better	0.47	0.092	0.16-1.14
Good control over health	0.73	0.59	0.26-2.11
Rehab			
Empowered to manage health	0.53	0.20	0.20-1.42
Health behaviour changed for better	0.48	0.67	0.19-1.47
Good control over health	0.77	0.67	0.24-2.47
Nurses			
Empowered to manage health	0.43	0.006	0.24-0.78
Health behaviour changed for better	1.79	0.104	0.89-0.58
Good control over health	0.46	0.036	0.22-0.95
None			

Empowered to manage health	0.84	0.772	0.25-2.81
Health behaviour changed for better	0.09	0.001	0.02-0.37
Good control over health	0.58	0.388	0.17-2.00

Doctors as reference outcome

Post Admission Phase (POP)

Results emanating from the bivariate analysis of the POP showed no statistically significant association between the HP/DP variables and the various HCW cadres. The results show a 100% response from patients who were attended to by rehabilitation health workers on the importance of treatment compliance (Table 5). The results further showed that 70% of patients attended to by rehabilitation health workers were educated on the benefits of physical exercise and fitness. Similarly, 60% and 75% of patients were respectively educated by the medical doctors and nurses on the benefits of physical exercise and fitness.

Table 5: Bivariate analysis between outcome variable (Which HCW group gave you a call post-admission?) and predictor variables

Predictors	Responses	Attending HCW at Post Admission Phase (POP) (Frequency, %)				<i>p-value</i>
		Rehab	Doctors	Nurses	None	
Educated on importance of treatment compliance	Not attended	0	1((4.00%)	5(20.83%)	45(10.51%)	0.244*
	Attended to	10(100%)	24(96.00%)	19(79.17%)	383(89.49%)	
Educated on the benefits of physical exercise and fitness	Not attended	3(30.00%)	10(40.00%)	6(25.00%)	140(32.63%)	0.737*
	Attended to	7(70.00%)	15(60.00%)	18(75.00%)	289(67.37%)	
Received Information concerning preventable diseases	Not attended	4(40.00%)	11(45.83%)	12(50.00%)	230(53.49%)	0.737*
	Attended to	6(60.00%)	13(54.17%)	12(50.00%)	200(46.51%)	
Addressed physical and environmental needs	Not attended	1(10.00%)	4(17.39%)	11(45.83%)	105(24.65%)	0.077*
	Attended to	9(90.00%)	19(82.61%)	13(54.17%)	321(75.35%)	
Empowered to manage health	Not attended	1(10.00%)	4(17.39)	8(36.36%)	77(18.25%)	0.186*
	Attended to	9(90.00%)	19(82.61%)	14(63.64%)	345(81.75%)	
Satisfied with HP services	Not attended	1(10.00%)	7(29.17%)	7(31.82%)	84(19.76%)	0.287*
	Attended to	9(90.00%)	17(70.83%)	15(68.18%)	341(80.24%)	

Health behaviour changed for better	Not attended	1(10.00)	5(21.74%)	3(13.64%)	106(25.18%)	0.518*
	Attended to	9(90.00%)	18(78.26%)	19(86.36%)	315(74.82%)	
Good control over health	Not attended	1(10.00%)	3(13.04%)	7(31.82%)	70(16.59%)	0.293*
	Attended to	9(90.00%)	20(86.96%)	15(68.18%)	352(83.41%)	

*Fishers exact test was used because some frequencies were less than 10.

Final model multivariate analysis of the POP identified three HP/DP variables that were significantly associated with nurses practice (Table 6). The analysis show that nurses in the POP were 3.13 (95%CI: 1.02-5.09) times more likely to influence patients change their health behaviour for better compared to patients not seen by any healthcare worker. The analysis further showed that patients who were attended to by nurses were 0.29 (95% CI 0.09-0.90) and 0.17 (95% CI 0.06-0.53) times less likely to be educated on importance of treatment compliance and empowered to have good control over health respectively, compared to patients attended to by no health worker.

Table 6: Multinomial regression model analysis relating HP/ DP services and HCW groups in POP

Predictors	Relative Risk Ratio	<i>p</i> -value	95% Confidence Interval
Rehab			
Educated on importance of treatment compliance	0.81	0.530	0.48-1.87
Health behaviour changed for better	2.56	0.425	0.25-25.93
Good control over health	0.95	0.967	0.09-9.72
Doctors			
Educated on importance of treatment compliance	2.36	0.411	0.30-18.36
Health behaviour changed for better	0.98	0.980	0.30-3.18
Good control over health	1.24	0.764	0.30-5.20
Nurses			
Educated on importance of treatment compliance	0.29	0.031	0.09-0.90
Health behaviour changed for better	3.13	0.008	1.02-5.09
Good control over health	0.17	0.002	0.06-0.53

None (no healthcare worker) as base outcome

Discussion

The Health Promotion Provision assessment (HPPA) is a good tool for assessing the view of patients regarding the quality of health care services received from various groups of HCWs. We used it to assess the HP and DP services provided by the different HCW groups in three phases of patient care: pre-admission phase, admission phase, and post admission phase. Patients' assessment of HCWs' HP and DP performance were influenced by their experiences from the HCWs. Consistent with existing studies, our data show that patients received HP and DP services from HCWs mostly during the PAP and ADP (32–36), while the least of such services were received in the POP (37). As observed in other studies (38–40), our study revealed that medical doctors had the greatest positive HP and DP influence on patients at both the PAP and ADP, while nurses influence was greatest at the POP .

In the PAP, our results showed that majority (greater than 50%) of patients seen by the various cadres of HCWs were adequately attended to across the statistically significant HP and DP services delivered. This finding may be related to the chosen study institution, in this case, a tertiary hospital. A tertiary hospital is a specialist centre (41) where patients with special needs beyond the care of the primary and secondary level hospitals are referred to. When patients with specific needs are seen by the appropriate specialists, chances are that they will receive the best care possible including HP and DP services. Although the rehabilitation health workers recorded a 100% response rate from patients regarding their role in educating patients on the importance of treatment compliance, this variable at PAP was not found to be statistically significant. Further in the PAP, greater number of patients were attended to by the medical doctors and nurses, and reasons for this may be due to the tailored needs of patients and a higher numerical staffing for these cadres of HCWs (29) compared to rehabilitation health workers in the hospital.

Again, in the PAP, patients' satisfaction with HP services were 0.45 and 0.68 times lower by their interactions with nurses when compared to their interactions with medical doctors. Our findings corroborate with the results of Kalroozi, Dadgari, and Zareiyan (42) who reported 17.2% dissatisfaction of patients from nurses and only 8% dissatisfaction from medical doctors. The study of Karoozi et al showed that high patients' satisfaction with doctors was however demonstrated in the highly specialized wards of open-heart surgery. The current study, however, did not explore patients' satisfaction at the specialized wards, and this warrants further exploration. Similarly, the study of Stump et al 2019 (43) which showed that 90% of primary care physicians recommended HP and DP activities to their patients further supports our finding. Though our study's finding shows that patients in the PAP were 1.12 times more likely to receive information concerning preventable diseases from the rehabilitation service staff compared to receiving it from medical doctors, this finding was not statistically significant, and search of the literature did not reveal a previous study to which this finding could be correlated. This finding can be explained in the light of the doctor – patient relationship which

can be considered to be one of the most ethically significant dimensions of good medical care. It is during the interactions that constitute this relationship that information is shared, that choices get determined, that reassurances are provided, that decisions are made and, ultimately, that care is given, hence, the positive influence of medical doctors (44).

During the ADP, we found that patients' empowerment to both manage and have good control over their health were 0.43 and 0.46 times less from their interactions with nurses when compared to their interactions with medical doctors. Although the contributions of all HCWs are strongly acknowledged and appreciated, during hospital admissions, patients believe that medical doctors have the final say regarding the quality of care they receive towards wellbeing. Further in the ADP, it was noted that patients ability to change their health behaviour for better was 1.79 times better from their interaction with nurses compared to medical doctors, this finding was however not statistically significant.

Results from the POP showed that nurses were more likely to influence better health behavioral change among patients compared to patients who were not attended to by any HCW. Further findings from the POP reveal that the influence from medical doctors, social workers, rehabilitation health workers, and dieticians was less likely to influence patients. This may be related to the minimal participation of these groups of HCWs in patients' care once patients have been discharged. This minimal participation of certain groups of HCWs may be connected to the several challenges confronting the health department of the study area such as constrained human resources and infrastructure (45,46). At the POP, nurses were the only HCW group that positively influenced a HP/DP variable. This findings corroborate the study of Guzmán, Ferreira, and de Andrade (2020) which highlighted the important role nurses played through care networks in ensuring continuity of nursing services for discharged patients (47).

Although no study comparing HP and DP impact at the different phases was identified, most HP and DP services carried out at the primary healthcare centers are outpatient services (pre-admission phases). The WHO vision for primary healthcare in the 21st century recognizes HP and DP as a vital primary care responsibility in the delivery of comprehensive healthcare services (48). Whilst some studies (49,50) have attempted to explore the HP and DP services at primary healthcare, this study is distinctive in linking the HCWs HP and DP services at a tertiary level hospital with the accruing HP empowerment.

We also noted that two HP dimensions; 'patients' empowerment to manage their health' and 'patients' empowerment to have good control over their health' were the most recurrent variables. The former occurring twice in PAP and ADP, while the later dimension occurred twice in ADP and POP. The occurrence of both dimensions in the PAP and ADP may be related to most hospital outpatients and inpatients having risk factors (33) that are amenable to changes following their interactions with HCWs.

Limitations and strengths

The study was conducted in only one tertiary hospital which draws patients from many hospitals within the region. Thus, we may not have accommodated some of the views of patients at the primary and secondary level hospitals. We have attempted to address this shortfall by considering patients that were referred to the hospital from the lower levels. Furthermore, the study did not include the specialized wards of the hospital and offers potential for future explorations. A major strength of this study is the comparison of patients' views concerning the various HCW groups and the stratification of the various phases of patients care which makes it easier to identify which HCW group and care phase needs to be strengthened.

Conclusion

This study presents evidence on patients' views of HP and DP services offered by HCWs in a South African tertiary hospital context. The study revealed the complementarity of HCWs in delivering HP and DP services to patients, evidenced by the differential influences on patients by the different groups of HCW groups. While HP and DP services were delivered better to patients during the PAP and ADP, the least services were delivered during the POP, the impact of some HCWs were minimally noticed at all phases. The study revealed that nurses were less likely to empower patients to manage their health and take good control over health during admission, respectively compared to doctors. Our study expounds on essential elements that may assist HCWs and policymakers to predict and enhance quality within healthcare facilities. To improve on the quality of HP and DP services by HCWs, more attention needs to be paid to the POP and HCWs whose HP and DP services were identified to be less influential, and skills on key dimensions that potentiates outcome. Periodic trainings of HCWs on how to give effective HP and DP services using better communication methods is therefore recommended. Furthermore, it is important to conduct a periodic needs assessment to identify patients' expectations and merge this with services from HCWs. Similar studies including details on participants' demography should be conducted at the primary and secondary care levels. Such studies should also explore reasons why most HP and DP services were perceived to be given by certain HCWs and at certain phases.

Declarations

- 1. Ethics approval and consent to participate:** Ethical approvals for this study were granted by the University of KwaZulu-Natal Biomedical Research Ethics Committee on 04 November 2019 (BREC /00000088/2019) and the Research Committee of the Eastern Cape Health Department on 08 November 2019 (EC_201910_012). Informed consent was obtained from all

participants. All methods were carried out in accordance with relevant guidelines and regulations

2. **Consent for publication:** Not applicable
3. **Competing interests:** The authors declare that they have no financial or personal relationship(s) that may have inappropriately influenced them in writing this article.
4. **Funding:** This research was supported by the University of KwaZulu-Natal, College of Health Sciences scholarship funding.
5. **Author contributions:** Herbert Melariri: Conceptualization, Methodology, Software, Validation, Formal analysis, Investigation, Resources, Data curation, Writing - original draft, Writing - review & editing, Visualization, Project administration.
Chester Kalinda: Software, Validation, Formal analysis, Data curation, Writing - review & editing, Visualization.
Moses J. Chimbari: Validation, Resources, Writing - review & editing, Visualization, Supervision, Project administration, Funding acquisition.
6. **Acknowledgments:** The authors are grateful to patients who participated in this study.
7. **Data Availability Statement:** The datasets used and/or analyzed during the current study are available at the following link: <https://doi.org/10.7910/DVN/9JXKCG>

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Chapter 6
Synthesis, Implications for Practice, Limitations, Future
Research and General Conclusion

SYNTHESIS

Health promotion has become an integral component of healthcare delivery targeting all ages. According to the World Health Organization (WHO), health promotion comprises a regional call to action involving diverse stake holders – individuals, academics, state and community (1). Healthcare workers occupy a vantage position in the delivery of HP services to the population. The practice of HP and DP are increasingly recognized as integral to HCWs profession across the various levels of the healthcare system. Overall, this body of work proposes that it is both possible and important to consider adapting existing HP and disease prevention intervention practices for HCWs in the hospitals to improve health outcomes. Decisions need to be based on good knowledge of the level and specific healthcare facility, and appreciation of the structural system through which the adapted strategy is likely to have impact. To ensure that Health Promotion achieves its set objectives, health care workers (HCWs) / health professionals need to be actively involved. Evaluation of such involvement needs to take place using clear indicators that measure relevant parameters in the populations, or target audience. For a sustainable HP practice among HCWs at all levels of healthcare services, several factors need to be considered. A major factor affecting the practice of HP in the hospitals is related to standards against which practices could be weighed. Against the background of dependency on overt knowledge in setting standards, this research project elicited indicators for measuring HP practice to ensure that consistent judgements regarding HP are made. A summary of the key findings relative to each objective has been presented below.

Indicators for measuring HCWs' HP practices (Chapter 2)

The first objective of this study was to identify and evaluate the indicators for measuring HCWs' HP practices in the Nelson Mandela Bay Municipality. The identified indicators were broadly categorized into Facility Related Indicators (FRI), Health worker related indicators (HRI) and Outcome related indicators (ORI). The FRI represented indicators affecting HCWs' HP practices that are traceable to the functioning of the healthcare facility such as HP policy (2), HP budget (3), and guidelines for assessing HP practices of HCWs (4). Health workers related indicators revealed the extent to which HCWs are willing to participate in HP activities. Such activities include educating patients on disease conditions (5) and guiding patients on diet and lifestyle changes. The outcome related indicators that emerged from the study includes the reduction of the number of diseases (6) and reduction of disparities (7) reduction of number of injuries, reduction of number of disabilities were identified as predictors. Findings from this chapter of the research project provide a useful tool in measuring HP practices of healthcare workers.

Enablers and hindrances to HP services by HCWs (Chapter 3)

The second objective was to determine the enablers and hindrances to HP services by HCWs in the NMBM. The study identified thirteen categories of enablers and eight categories of hindrances.

Identified enablers that had associations with HP practice included – ‘collaborations among disciplines and organizations’, ‘HP quality assessment programme’, ‘programme planning with input from different levels’, ‘provisions to access patients’ ‘HP needs’, and ‘HP and DP orientation course for new employees’. Similarly, identified hindrances included – ‘lack of time’, ‘lack of structure for HP’, and ‘facility promoting treatment more than prevention’. Others are ‘lack of practice guidelines incorporating HP’, ‘lack of HP budget’, and ‘operational costs’. The enablers are factors that motivate or encourage HCWs HP practices while the hindrances serve as factors that discourage HCWs from rendering effective HP services. Enablers such as interdisciplinary collaborations, geared towards achieving patient centered care (PCC) has proven to be vital in a wide range of health and disease conditions (8). Previous studies observed several collaborative practices that promote information sharing on patients, care coordination, management plan development, and shared common goals among medical doctors and allied health workers (9). A comprehensive intervention plan involving multi-level collaboration in HP and DP program planning and implementation has great potentials to enhance HP practices among HCWs. Findings from this chapter unraveled key areas that need to be addressed by the healthcare system and policy makers in order to enhance the HP services rendered by HCWs.

Training, attitude, and practice of HP among HCWs (Chapter 4)

The third objective was to identify and analyse the relationship between HCWs’ training, attitude, and practice of HP in the Nelson Mandela Bay Municipality. Most of the HCWs in the study area had never participated in any HP or DP training. This was associated with a lack of coordinated HP training for HCWs at the various healthcare facilities in the study area. This was consistent with the findings of a previous study by Cancedda et al 2015 (10).

The study showed that the few that had participated in HP and DP training had positive behaviour, attributions, and emotional responses when compared to HCWs who did not receive HP training. The major impediments to training reported by the HCWs included lack of training infrastructure in healthcare facilities. Furthermore, this study affirmed the need for HCWs to model good health and lifestyle practices before advising patients (11,12).

The fourth objective was to identify and comparatively evaluate the relationship between HP services at the primary and tertiary healthcare levels in the study area. This objective was addressed progressively in the previous chapters on objectives one, two and three above. From the first objective, analysis of the three indicator categories (FRI, HRI, and ORI) shows that 14 FRI dimensions were associated with HP at tertiary facility level while only two dimensions were associated with HP at primary healthcare level. Eight HRI dimensions were associated with HP at tertiary level, while only one was recorded at the primary level. Three ORI dimensions were associated with HP at the tertiary

healthcare level, while none was identified at the primary level. Comparative evaluation of enablers and hindrances between the primary and tertiary levels of healthcare showed significant differences. Eleven enablers were identified at the tertiary level while none was identified at the primary level. Furthermore, one hindrance was identified at the primary healthcare level while six were identified at the tertiary level where continuing professional development for health promotion was significant to enhanced HP practices of HCWs. Such training should aim at equipping HCWs with the requisite skills to render adequate HP services to the population (13). Results of HP activities as reported by the HCWs from this study show that tertiary level hospitals wielded more HP influence when compared to the primary healthcare levels. However, there is a dearth of information on the comparative evaluation of HP activities of HCWs at the various healthcare levels.

Patients' views regarding quality of HP services they received from HCWs (Chapter 5)

The fifth and final objective of this study was to assess the views of patients regarding quality of HP services they received from HCWs in the NMBM healthcare services. Patients' views were captured in three phases: pre-admission phase (PAP), admission phase (ADP) and post admission phase (POP). The HP influence reported by the patients were recorded mostly in the pre- admission and admission phases of patient care. The findings revealed that nurses played a more beneficial role towards 'health behaviors changing for better' while medical doctors played a more beneficial role towards influencing patients to have good control over their health in ADP. Results from the post admission phase showed that nurses were more likely to influence better health behavioural change among patients.

Furthermore, HP influence reported by the patients were recorded mostly in the pre- admission and during admission phases of the patient care. This further emphasizes on the need for HP services during the post admission phase of patients' care. Findings from this study compares well with a previous study by Guzmán, Ferreira, and de Andrade (2020) which highlighted the important role nurses played in rendering healthcare services for discharged patients (14)

IMPLICATIONS FOR PRACTICE

To realise a change in the practice attitudes and motivations of healthcare workers towards HP, it is important that there be sufficient knowledge transfer from the scientific community to, on the one hand, policy makers to facilitate a top-down transfer, and on the other, to healthcare workers who ensures a complementary bottom-up approach (15).

The skills necessary for the implementation of HP roles need be embedded into academic curricula of HCWs undergraduate programmes. Such activities need be extended as part of ongoing continuous professional development trainings, shifting from the traditional biomedical care model to a biopsychosocial one (16). The benefits of this agenda will be to empower the professionals in terms of

skill as well as bolstering their perceptions regarding HP. Furthermore, attention is drawn to the policy makers on the urgency to incentivize HP services by healthcare workers at all levels of care (17–19). This should be complemented with motivation of service managers whose operational teams are responsible for undertaking the roles of initiating and implementing HP activities as well as social marketing drives (20). Potential benefits of social marketing include increased awareness and dissemination of public health interventions as well as promotion of healthy behaviour and provision of key health information to the population (21,22). Frequently, an increasing number of patients in hospitals present with chronic conditions warranting ongoing support, and HCWs are regularly exposed to physical and emotional strains. Fundamentally, all levels of hospitals need to establish well-coordinated HP and DP departments or units where clear roles are spelled out (23). These departments must be overseen by specialist in HP and DP care. Pertinent to mention that hospitals have lasting influence of patients and family members who are receptive to health instructions and advise during ill health.

Given the rising prevalence of chronic diseases in South Africa (24–26), HP has become a fundamental concern. Since most hospital based biomedical treatments do not cure, but improve patient's life quality, adequate preparation of patients and their families regarding HP and DP prior to discharge is vital (27,28) to reduce readmission. The goal is to empower patients and relatives towards self-care in relation to a specific healthcare agenda for a patient (16). Planned interventions need be tailored to conform to the peculiar socio-cultural context to ensure feasibility of implementation and appropriateness of HP strategy (29,30) as well as sustainability. This approach will ensure ease in the resolution of any emanating challenges such as acceptability, and eventually changing the practice of HCWs. Development of HP and DP operational guidelines should be seen as a priority to ensure HCWs practice is well guided and coordinated. Communication channels between policy makers, health system managers, HCWs and patients should also be coordinated to avoid contradictory information regarding HP and DP.

LIMITATIONS

The following were limitations of this doctoral thesis research.

1. The study focussed on one municipality in South Africa, thus findings emanating may not be a true reflection in other parts of the country
2. The study also focussed only on public hospitals that serve majority of the indigent population. It is noted that a big gap exists between the public and private sector in South Africa with only about 22% of the NMBM population covered by a medical aid scheme (31).

3. In phase one study focussing on HCWs there was possibility of information bias emanating from HCWs' self-reporting of information. There is an associated risk of recall bias or poor memory resulting in over or under reporting of situation.
4. In the second phase study focussing on patients, data collection period was brief, and patients who presented at different times could have been missed. Patients not sampled in this phase may have responded differently.
5. Since the study was a cross-sectional design, it is difficult to make a causal inference (32). Associations in this study thus needed to be interpreted with caution as with all cross-sectional studies (32).

FUTURE RESEARCH

The survey was conducted only in one municipality of South Africa. For generalization of findings across the nation, similar studies need to be conducted country-wide and should include the private sector. Secondly, a longitudinal study involving both HCWs and patients to assess both the outcome of HP practice and HP services received over time is essential. Thirdly, there is need to train HCWs in the municipality in HP and DP and conduct a pre and post intervention to assess the impact of this training. Finally, more HP and DP related studies should be conducted in Africa as much of the literature available is for the developed world.

GENERAL CONCLUSION

This study evaluated the health promotion roles of HCWs as well as patients' views regarding HP services they receive. The study showed an imbalance between biomedical care and health promotion and disease prevention services at all levels of healthcare in the municipality. There was sufficient evidence indicating the importance of refocusing the healthcare services in the NMBM to be health promoting in nature. However, implementation of a more health promoting service is multifaceted and complex, requiring changes in HCWs behaviour and patients' attitude on one hand, and management on the other. Management and policy makers have crucial roles in creating opportunities for the various HCW groups to be involved in health promotion practices through structural reorganization and reprioritization. This study has provided guidance on how change towards a pro-health promotion health service can be initiated.

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ANNEXURES

Annexure 1



04 November 2019

Dr Herbert Ikechukwu Melariri (219095975)
School of Nurs & Public Health
Howard College Campus

Dear Dr Herbert Ikechukwu Melariri,

Protocol reference number: BREC/0000088/2019
Project title: EVALUATION OF HEALTH PROMOTION ROLES AND SERVICES OFFERED BY HEALTH WORKERS IN THE NELSON MANDELA BAY MUNICIPALITY OF EASTERN CAPE, SOUTH AFRICA
Degree Purposes: PhD

EXPEDITED APPLICATION: APPROVAL LETTER

A sub-committee of the Biomedical Research Ethics Committee has considered and noted your application.

The conditions have been met and the study is given full ethics approval and may begin as from 04 November 2019. Please ensure that outstanding site permissions are obtained and forwarded to BREC for approval before commencing research at a site.

This approval is valid for one year from 04 November 2019. To ensure uninterrupted approval of this study beyond the approval expiry date, an application for recertification must be submitted to BREC on the appropriate BREC form 2-3 months before the expiry date.

Any amendments to this study, unless urgently required to ensure safety of participants, must be approved by BREC prior to implementation.

Your acceptance of this approval denotes your compliance with South African National Research Ethics Guidelines (2015), South African National Good Clinical Practice Guidelines (2006) (if applicable) and with UKZN BREC ethics requirements as contained in the UKZN BREC Terms of Reference and Standard Operating Procedures, all available at <http://research.ukzn.ac.za/Research-Ethics/Biomedical-Research-Ethics.aspx>.

BREC is registered with the South African National Health Research Ethics Council (REC-290408-009). BREC has US Office for Human Research Protections (OHRP) Federal-wide Assurance (FWA 678).

The sub-committee's decision will be noted by a full Committee at its next meeting taking place on 10 December 2019.

Yours sincerely

Prof V Rambiritch (Chair)

Biomedical Research Ethics Committee
Prof V Rambiritch (Chair)
UKZN Research Ethics Office Westville Campus, Govan Mbeki Building
Postal Address: Private Bag X54001, Durban 4001
Website: <http://research.ukzn.ac.za/Research-Ethics/>

Founding Campuses: Edgewood Howard College Medical School Nelson Mandela Bay Westville

INSPIRING GREATNESS

Annexure 2



05 February 2020

Dr Herbert Ikechukwu Melariri (219095975)
School of Nurs & Public Health
Howard College

Dear Dr Herbert Ikechukwu Melariri,

Protocol reference number: BREC/00000088/2019
Project title: Evaluation of health promotion roles and services offered by health workers in the Nelson Mandela Bay municipality of Eastern Cape, South Africa
Degree: PhD

We wish to advise you that your correspondence received on 22 January 2020 submitting an application for amendments dated 22 January 2020 has been noted and approved by a subcommittee of the Biomedical Research Ethics Committee.

The committee will be notified of the above at its next meeting to be held 10 March 2020.

Yours faithfully


.....
Prof V Rambiritch (Chair)
AM/pp

Biomedical Research Ethics Committee
Prof Virendra Rambiritch (Chair)
UKZN Research Ethics Office Westville Campus, Govan Mbeki Building
Postal Address: Private Bag X5-1001, Durban 4000
Website: <http://research.ukzn.ac.za/Research-Ethics/>

Founding Campuses:  Edgewood  Howard College  Medical School  Pietermaritzburg  Westville

INSPIRING GREATNESS



Province of the
EASTERN CAPE
 HEALTH

Enquiries: Zonwabele Merile

Tel no: 083 378 1202

Email: zonwabele.merile@ehealth.gov.za

Fax no: 043 642 1409

Date: 08 November 2019

RE: Evaluation of health promotion roles and services offered by health workers in the Nelson Mandela Bay Municipality of Eastern Cape, South Africa. (EC_201910_012)

Dear Dr Herbert Ikechukwu Melariri.


The department would like to inform you that your application for the abovementioned research topic has been approved based on the following conditions:

1. During your study, you will follow the submitted protocol with ethical approval and can only deviate from it after having a written approval from the Department of Health in writing.
2. You are advised to ensure, observe and respect the rights and culture of your research participants and maintain confidentiality of their identities and shall remove or not collect any information which can be used to link the participants.
3. The Department of Health expects you to provide a progress update on your study every 3 months (from date you received this letter) in writing.
4. At the end of your study, you will be expected to send a full written report with your findings and implementable recommendations to the Eastern Cape Health Research Committee secretariat. You may also be invited to the department to come and present your research findings with your implementable recommendations.
5. Your results on the Eastern Cape will not be presented anywhere unless you have shared them with the Department of Health as indicated above.

Your compliance in this regard will be highly appreciated.



SECRETARIAT: EASTERN CAPE HEALTH RESEARCH COMMITTEE

 <p>Province of the EASTERN CAPE HEALTH</p>	Office of the Clinical Governance Manager Nelson Mandela Bay Health District Private Bag X 28000, Greenacres, Port Elizabeth. 6057. REPUBLIC OF SOUTH AFRICA
Enquiries : Dr L P MAYEKISO Telephone : 041-391-8173 Facsimile : 041-391-8133 E-mail : mbasa.mayekiso@gmail.com	Our Reference: RES MELARIRI /2019 Your Reference: Date: 18 NOVEMBER 2019

DR HERBERT MELARIRI
SCHOOL OF NURSING AND PUBLIC HEALTH
HOWARD COLLEGE CAMPUS
melariri@gmail.com

REQUEST FOR PERMISSION TO CONDUCT RESEARCH ON THE EVALUATION OF HEALTH PROMOTION ROLES AND SERVICES OFFERED BY HEALTH WORKERS IN THE NELSON MANDELA BAY MUNICIPALITY OF EASTERN CAPE, SOUTH AFRICA

In response to your application for permission to conduct the above research, permission is hereby granted with the following proviso:

- Health service delivery should not be disrupted under any circumstances.
- Timeous appointments must be made with the relevant persons prior to commencement of interviews/visits.
- All required data should be collected by the Researcher or a designated fieldworker (whose name should be forwarded to the relevant Sub District Coordinators prior to data collection). The Sub District Coordinators Messrs. Msutu – 083 378 1942, Koll – 060 563 1225 and Reuters – 060 557 9732 should be contacted **before** your visit and this letter is to be presented when visiting the facilities

The Nelson Mandela Bay Health District, as the research site, will expect a copy of the final research report when the study is completed. If the duration of the research period is required to be extended, the District Office (District Manager) should be informed accordingly.

This Office would like to wish you well in your research study.

Yours faithfully



DR L P MAYEKISO
CLINICAL GOVERNANCE MANAGER – NMBHD

Annexure 5



Province of the
EASTERN CAPE
HEALTH

Office of the Senior Manager, Medical Services • 1st Floor • Nurse • Home • Livingstone Hospital • Stanford Road • Korsten • Port Elizabeth
PO Korsten • Port Elizabeth • 6014 • REPUBLIC OF SOUTH AFRICA
Tel : +27 (0)414052100/2101/2102 • fax: +27 (0)41 2105 2103

25 November 2019

Dr H Melariri
Department of Surgery
Livingstone Tertiary Hospital
Port Elizabeth

To e-mail: melariri@r.nail.com

Re: Request To Do Research: EVALUATION OF HEALTH PROMOTION ROLES AND SERVICES OFFERED BY HEALTH WORKERS IN THE NELSON MANDELA BAY MUNICIPALITY OF EASTERN CAPE, SOUTH AFRICA.

Your e-mail received 15 November 2019 refers.

Authorisation is herewith granted to do your research at Livingstone Tertiary Hospital; this includes the PE Provincial Hospital site but not Dora Nginza Hospital (contact telephone no: 041 406 4111).

Kindly contact the Nursing Manager, Mrs T Notshe on telephone no 041 405 2220 (e-mail: tembisa.kvatshanotshe@echealth.gov.za) and the DD Therapeutic and Medical Support Services, Mrs N Mthembu on telephone no 041 405 2644 (e-mail: Nombulelo.Mthembu@echealth.gov.za) to make the necessary logistic arrangements for both institutions. You are given permission to approach the doctors directly, but to respect their decisions regarding participation.

You are advised to ensure, observe and respect the rights and culture of your research participants and maintain confidentiality at all times.

Regular reports detailing your findings and recommendations are to be made available to the hospital.

Wishing you success with your ongoing the research.



.....
DR AR KNOCK
ACTING SENIOR MANAGER MEDICAL SERVICES
ARK/jhm

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24 hour Call Centre: 0800 032 364
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Room DG 28A • Dora Nginza Regional Hospital • Spondo Street • Zwide • Port Elizabeth • Eastern Cape
Private Bag X11951 • Algoa Park • Port Elizabeth • 6005 • REPUBLIC OF SOUTH AFRICA
Tel: +27 (0)41 406 4014 • Cell: +27 (0)82 956 6709 • Fax: +27 (0)866 413 211 • Email: jaline.kotze@echealth.gov.za

20 November 2019

Dr HI Melariri

RE: REQUEST TO DO RESEARCH

Dear Dr Melariri

Your request to do research at Dora Nginza Regional Hospital is hereby approved.

The approval is granted with the following conditions attached:

1. Adherence to the conditions as set out in the ethics approval from UKZN.
2. Adherence to the conditions as set out in the approval from the ECDOH research committee.

I wish you all the success with your research.

Regards,



Dr Jaline Kotze
Senior Manager: Medical Services
Dora Nginza Regional Hospital



Province of the
EASTERN CAPE
HEALTH

Room 110 • 1st Floor • Provincial Hospital • Channer Street • Uitenhage • Eastern Cape
Private Bag X36 • Uitenhage • 6230 • REPUBLIC OF SOUTH AFRICA
Tel.: +27 (0)41 995 1103 • Fax: +27 (0)41 966 2604 • Website: www.ecdoh.gov.za

Attention: Dr. HI Melariri (Student nr: 219095975)

Re: REQUEST PERMISSION TO DO RESEARCH: 'EVALUATION OF HEALTH PROMOTION ROLES AND SERVICES BY HEALTH WORKERS IN THE NELSON MANDELA BAY MUNICIPALITY OF EASTERN CAPE, SOUTH AFRICA.' (EC 201910_012).

1. With reference to your letter dated 19 November 2019 regarding abovementioned matter, I would hereby grant official permission for the study to be performed in our hospital.
2. We also acknowledge the letter from UKZN Ethical Committee where you are currently busy with your studies confirming this. (Brec/0000088/2019)
3. It is also noted that permission was granted by the ECDOH to do the research.
4. Permission is granted based on the adherence to the ethical principles and conditions as set out in approval letters from UKZN and ECDOH.
5. A copy of the consent letter is forwarded to the Managers at Uitenhage Provincial Hospital
6. It will be expected from you to make prior arrangements with this office regarding your proposed visit to the hospital in order to inform staff.
7. We wish you well with the studies and would appreciate it if you will give us feedback of the findings of the study.



Mrs. MP Klassen (CEO – Uitenhage Provincial Hospital)

United in achieving quality health care for all

24 hour call centre: 0800 0323 64
Website: www.ecdoh.gov.za



Ikamva eliqaqambileyo!

UKZN BIOMEDICAL RESEARCH ETHICS COMMITTEE

APPLICATION FOR ETHICS APPROVAL

For research with human participants (Biomedical)

INDIVIDUAL INFORMED CONSENT

Study Title: Evaluation of Health Promotion Roles and Services offered by health workers in the Nelson Mandela Bay Municipality of Eastern Cape, South Africa

Information Sheet and Consent to Participate in Research

Date: 22/01/2020

Dear Participant,

My name is Herbert Melariri. I am a PhD student in Public Health at the University of KwaZulu-Natal (UKZN). My contact details are: Mobile Number: 0731214569, email: melariri@gmail.com

You are being invited to consider participating in this study titled: **Evaluation of Health Promotion Roles and Services offered by health workers in the Nelson Mandela Bay Municipality of Eastern Cape, South Africa**

The aim of the study is to determine the enablers and hindrances to HP services by HCW in NMBM. The study will also examine the indicators for measuring health promotion effectiveness and compare the relationship of HP services at the primary and tertiary health institutions in the NMBM. The study also aims to identify and analyze the relationship between staff training and practice of HP in the Nelson Mandela Bay Municipality

The study is expected to enroll 350 adult health workers (aged at least 18 years) and 292 patients of both gender in the NMBM. The study involves HCWs completing a semi structured questionnaire and patients completing patients' questionnaire through an administrator. The duration of your participation if you choose to enroll in the study is expected to be about 20

minutes. This study does not have activities that cause any harm. There are no direct benefits from the study to you. However, by participating in this study you will contribute to the knowledge that will be useful for improving healthcare services planning and delivery.

This study has been ethically reviewed and approved by the UKZN Biomedical research Ethics Committee (approval number BREC/00000088/2019)

In the event of any problems or concerns/questions you may contact the researcher at the aforementioned phone number and/or email address or the UKZN Biomedical Research Ethics Committee, contact details as follows:

BIOMEDICAL RESEARCH ETHICS ADMINISTRATION

Research Office, Westville Campus

Govan Mbeki Building

Private Bag X 54001

Durban

4000

KwaZulu-Natal, SOUTH AFRICA

Tel: 27 31 2604769 - Fax: 27 31 2604609

Email: BREC@ukzn.ac.za

Participation in this research is voluntary and you may withdraw your consent and discontinue with the study at any time without penalty.

If you choose to withdraw from the study, all the information collected from you will be removed from the study consistent with the provisions on consent.

You will not incur any costs because of participating in this study. You can indicate your willingness to participate in this study by signing in the space provided in this form. The electronic signatures collected as sign of consent are recognized as signatures on paper and have equal rights of consent for participants. The researchers will maintain the confidentiality of any elicited information pertaining to you and as such, the participant will only know information. No other information related to you will be passed on to anyone else without your knowledge and permission. Data collected in this study will be kept for 5 years after the study to allow for any further analysis and research publication.

CONSENT

I have been informed about the study entitled **Evaluation of Health Promotion Roles and Services offered by health workers in the Nelson Mandela Bay Municipality of Eastern Cape, South Africa** by Herbert Melariri.

Please write Yes if you agree and No if you don't agree with the statements below	Yes or No
I have understood the purpose and procedures of the study.	
I have been given an opportunity to ask questions about the study and have had answers to my satisfaction.	
I declare that my participation in this study is entirely voluntary and that I may withdraw at any time without affecting any treatment or care that I would usually be entitled to.	
If I have any questions/concerns about my rights as a study participant, I understand I may contact the researcher at: Mobile - 0731214569, email – melariri@gmail.com	

If I have any questions or concerns about my rights as a study participant, or if I am concerned about an aspect of the study or the researchers then I may contact:

BIOMEDICAL RESEARCH ETHICS ADMINISTRATION

Research Office, Westville Campus

Govan Mbeki Building

Private Bag X 54001

Durban

4000

KwaZulu-Natal, SOUTH AFRICA

Tel: 27 31 2604769 - Fax: 27 31 2604609

Email: BRECE@ukzn.ac.za

Signature of Participant

Date

Signature of Witness
(Where applicable)

Date

Signature of Translator
(Where applicable)

Date

Questionnaire for a PhD Research

Topic: EVALUATION OF HEALTH PROMOTION (HP) ROLES AND SERVICES OFFERED BY HEALTH WORKERS IN THE NELSON MANDELA BAY MUNICIPALITY OF EASTERN CAPE, SOUTH AFRICA

by

HERBERT MELARIRI

SECTION A						
1	Sex	Male			Female	
2	What is your healthcare (HC) facility level?	Primary HC facility				
		Secondary HC facility				
		Tertiary HC facility				
3	Are you a registered HC professional in South Africa?	Yes			No	
4	If yes, in what profession were you registered? (please tick the appropriate one)	Medical doctor				
		Registered Nurse				
		Dietician				
		Physiotherapist				
		Speech therapist				
		Occupational therapist				
		Social worker				
SECTION B						
Kindly tick your preferred option						
Variable		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
5	A holistic knowledge of disease pathology and processes are vital for effective care of patients					
6	Health care workers (HCW) occupy a vantage position relevant in promoting patients' health because the patients can be spoken to as a group and /or one on one					

	Variable	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
7	HCW should model good health behavior in order to give HP advice					
8	HCW should be encouraged to engage in HP as part of government policy and healthcare services					
9	HP seeks to create a more equitable society					
10	HP strives to alleviate the economic burden on the health system					
11	HP is mostly concerned with changing people's behaviour					
12	HP is about changing public policy					
13	HP is about empowering individuals					
14	HP aims to reduce health inequality					
15	I make it a point to educate my patients about the disease condition they present with					
16	I educate my patients and provide necessary guidance about diet and lifestyle prior to discharge					
17	I educate my patients, prior discharge, on the need for a routine checkup					
18	Health promotion is a waste of time					
19	Patients who deliberately engage in an unhealthy lifestyle will not benefit from health promotion					
20	Health education, advise and counseling from HCW could positively enhance patients' health					

	Variable	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
21	I do not have time to implement health promotion					
22	I have adequate knowledge regarding the condition patients present with in this unit to provide health promotion services					
23	Patients do not want health education from HCW					
24	I am aware of how important it is to educate my patients about their Condition					
25	There are sufficient resources to assist me in the application of best practices of health promotion for my patients					
26	I encourage my patients to observe health and fitness assessments and/or health screening					
27	I assist my patients in accessing social grants, food and housing through the social welfare services					
28	In your own terms define health education as you understand the term					
29	In your own terms define health promotion as you understand the term					
30	Indicate things that hinder or discourage your participation in HP	<ul style="list-style-type: none"> a. Costs b. Patients attitude c. Lack of HP knowledge and skills d. Lack of time 				

	(circle as many as you consider applicable)	<ul style="list-style-type: none"> e. Lack of HP programs f. Institution promotes more of treatment than prevention of disease g. Negative attitudes of health care workers h. Lack of collaborations among disciplines i. No structure in place for HP j. Others (specify) 	
31	Indicate things that can enhance or encourage your participation in HP (circle as many as you consider applicable)	<ul style="list-style-type: none"> a. Supportive policies b. Adequate funding c. influence of socioeconomic factors of target population d. Availability of information about the target population e. Collaboration among disciplines and organizations (govt, NGOs, individuals) f. Effective communication strategies g. Knowledge of burden of health problem h. Up to date training on HP i. Planning programs with input from different levels j. Adequate time for HP 	
32	Is there a coordinated HP training for staff?	Yes	No
33	Is there any communication channel for HP in your facility	Yes	No
34	If yes, which communication channel does your facility use in promoting HP		
35	Do you engage in follow up visits with patients after they have been discharged from the hospital?	Yes	No
36	Are you involved in home visits to ascertain the health status of individuals in the communities?	Yes	No
37	Do you engage in Practical community-based placements?	Yes	No
38	If yes, what do you do in such visits		
39	Are you involved in offsite hours with patients empowering them?	Yes	No

40	Do you counsel patients to modify their risk factors?	Yes	No	
41	If yes, what are the risk factors that you address?			
42	Do you have personnel in your facility who coordinates HP services and functions?	Yes	No	I don't know
43	Does your facility have operational procedures such as clinical practice guidelines or pathways incorporating HP actions in clinical departments?	Yes	No	I don't know
44	Is there an identifiable budget for HP services and materials in your facility?	Yes	No	I don't know
45	Are data routinely captured on HP interventions?	Yes	No	I don't know
46	Are data available to staff for HP evaluation?	Yes	No	I don't know
47	Specific structures and facilities are required for health promotion in my facility (including resources, space, equipment)	Yes	No	
48	Have you ever participated in any HP training?	Yes	No	
49	If yes, when and where did the training take place?	a. Under 12 months ago b. 1-2 years ago c. 2-3years ago d. >3 years ago Where?		
50	If yes, what benefits do think were derived from the training	a. Improved knowledge b. Improved skills c. Enhanced confidence d. positive staff behavior, attributions and emotional responses e. Enhanced staff satisfaction f. increased support to patients g. Enhanced staff retention h. No added benefit		

51	Which of the following indicates how HP outcome is measured at your facility?	a. Coverage of target population b. Reduction of number of deaths c. Reduction of number of diseases, d. Reduction of number of injuries e. Reduction of number of disabilities f. Reduce health inequities g. Improved needs assessments h. Improved community participation and mobilisation i. Others – specify		
52	Is there a programme for quality assessment of the health promoting activities in your facility?	Yes	No	I don't know
53	Do you think HCW should participate in HP?	Yes	No	
54	Does your facility make provision to access patients need for HP?	Yes		No
55	If yes, when is the assessment of a patient's need for health promotion done in your facility?	At Patients' first contact with the hospital.	Before discharging the patient	During follow up visits to the hospital
56	Is patients HP assessment documented in the patient's record at admission?	Yes	No	I don't know
57	Are there guidelines / procedures for reassessing patients HP needs at discharge	Yes	No	I don't know
58	Are there guidelines / procedures for reassessing patients HP needs at the end of a given intervention	Yes	No	I don't know
59	Does your facility update patient's record with details on social and cultural background [Example: religion that requires special diet. Social conditions that may indicate that the patient is at risk].	Yes	No	I don't know
60	Do you inform the patients of factors impacting on their health?	Yes	No	I don't know
61	Is the plan for relevant activities for patient's	Yes	No	I don't know

	health promotion agreed in partnership with the patient?			
62	Does your facility have a health promotion policy?	Yes	No	I don't know
63	If Yes, indicate which of the following are covered in the legislation	a. HCW's role in HP b. Requirements/infrastructures for HP services c. Who receives HP services d. Where HP services should be delivered e. When HP services should be delivered		
64	Is there an induction training for new staff that addresses the hospital's health promotion policy?	Yes	No	I don't know
65	Are you aware of the content of the facility's health promotion policy? [Evidence: e.g. annual performance evaluation or staff participation in the HP program].	Yes	No	I don't know
66	Is there a performance appraisal system for health promotion in your facility?	Yes	No	I don't know
67	Is there a continuing professional development for health promotion in your facility	Yes	No	I don't know

Annexure 10

Patients' Questionnaire on Health Promotion services received at the healthcare facilities in the Nelson Mandela Bay Municipality

Research Topic: **EVALUATION OF HEALTH PROMOTION ROLES AND SERVICES OFFERED BY HEALTH WORKERS (HCW) IN THE NELSON MANDELA BAY MUNICIPALITY OF EASTERN CAPE, SOUTH AFRICA**

SECTION A

Please tick an (X) against your preferred option (More than one may be ticked where applicable)

		Dieticians	Rehabilitation services (Physio, occupational & speech therapists)	Doctors	Nurses	Social workers	None
1	Who gave you Clear, comprehensible information and support for self-care?						
2	Who properly attended to you before admission?						
3	Who properly attended to you while on admission?						
5	Who gave you a call after discharge?						
6	Who visited you after discharge?						
7	Who educated you about your disease condition?						
8	Who provided you with the necessary guidance about diet and lifestyle prior to discharge?						
9	Who encouraged you to observe health and fitness assessments and/or health screening?						
10	Who assisted you in accessing social grants, food and housing through the social welfare services?						

SECTION B

Please tick an (X) against your preferred option

	Variables	Strongly disagree	Disagree	Agree	Strongly agree
1.	I participated in decision making regarding my health				
2.	I was educated on the importance of taking my medication as prescribed				
3.	My individual needs, values and preferences were respected				
4.	The healthcare workers (HCW) educated me on the benefits of physical exercise and fitness				
5.	Information concerning some preventable diseases were given to me				
6.	The services given to me took consideration of my physical and environmental needs				
7.	There was involvement of, and support for my family and carers				
8.	The healthcare workers offered me emotional support, empathy and respect				
9.	I would like to be given more information about my condition,				
10.	I am supported and empowered by the healthcare workers to manage my health and condition				
11.	I am satisfied with the level of service I received in this healthcare facility				
12.	I have changed my health behaviour for better following the education from the HCW				
13.	I have good control over my health as a result of the support and empowerment I received from the HCW				

Global conferences on Health Promotion

Conference Theme	Year	City and Country	Conference Goals
The 1st International Conference on Health Promotion - The Ottawa Charter for Health Promotion	1986	Ottawa, Canada	<ol style="list-style-type: none"> 1. Build Healthy Public Policy 2. Create Supportive Environments 3. Strengthen Community Actions 4. Develop Personal Skills 5. Reorient Health Services
Second International Conference on Health Promotion-Adelaide Recommendations on Healthy Public Policy	1988	Adelaide, South Australia	<ol style="list-style-type: none"> 1. The Spirit of Alma-Ata 2. Healthy Public Policy 3. Accountability for Health 4. Developing New Health Alliances 5. Commitment to Global Public Health
Third International Conference on Health Promotion - Sundsvall Statement on Supportive Environments for Health	1991	Sundsvall, Sweden	<ol style="list-style-type: none"> 1. A Call for Action directed at policy makers 2. Dimensions of Action on Supportive Environments for Health 3. Proposals for Action 4. It Can be Done: Strengthening Social Action 5. The Global Perspective 6. Achieving Global Accountability
The Fourth International Conference on Health Promotion: New Players for a New Era - Leading Health Promotion into the 21st Century - Jakarta Declaration on Leading Health Promotion into the 21st Century	1997	Jakarta, Indonesia,	<ol style="list-style-type: none"> 1. Health promotion is a key Investment 2. Determinants of health: new Challenges 3. Health promotion makes a difference 4. New responses are needed
Fifth Global Conference on Health Promotion, Health Promotion: Bridging the Equity Gap, Mexico City - Mexico Ministerial	2000	Mexico	<ol style="list-style-type: none"> 1. Recognize that the attainment of the highest possible standard of health is a positive asset for the enjoyment of life and necessary or social and economic development and equity

Statement for the Promotion of Health: From Ideas to Action			<ol style="list-style-type: none"> 2. Health promotion and social development is a central duty and responsibility of governments 3. Despite progress, many health problems still persist
The 6th Global Conference on Health Promotion - Policy and partnership for action: addressing the determinants of health	2005	Bangkok, Thailand	<ol style="list-style-type: none"> 1. Sustainable Actions 2. Health friendly globalization 3. Partners
The 7th WHO Global Conference on Health Promotion - Towards Integration of Oral Health,	2009	Nairobi, Kenya	<ol style="list-style-type: none"> 1. Community empowerment 2. Health literacy and health behaviour 3. Strengthening health systems 4. Partnership and intersectoral action 5. Building capacity for health promotion
8th Global Conference on Health Promotion: Final Statement	2013	Helsinki, Finland	<ol style="list-style-type: none"> 1. To implement the intersectoral action for health and health in all policies approaches at the country level 2. To exchange experiences in implementing Health in All Policies including the identification of effective tools and other prerequisites for country action 3. To highlight the value of health promotion activities for health, their relevance for overall societal development and for development policies 4. To inform about economic aspects of health promotion 5. To highlight the important role of primary health care in health promotion 6. To review progress, impact and achievements of health promotion since the Ottawa Conference

<p>Ninth Global Conference on Health Promotion: "Health Promotion in the Sustainable Development Goals"</p>	<p>2016</p>	<p>Shanghai, China</p>	<ol style="list-style-type: none"> 1. To renew the mission of health promotion for the coming decades; 2. to make explicit and optimize the role/achievement of health promotion in improving health and health equity; 3. to provide guidance to countries on the practical application of health promotion concepts and methods to achieve the Sustainable Development Goals; 4. to galvanize political commitment to health for all through the Sustainable Development Goals; 5. to enable people, governments and civil society to address social determinants of health and, for people to enable to take control of their lives in order to achieve the Sustainable Development Goals; 6. to exchange national experiences in improving health literacy, intensifying action across sectors and social mobilization, and creating healthy cities, community and human settlements.
<p>Tenth Global Conference on Health Promotion for Well-being, Equity and Sustainable Development</p>	<p>2021</p>	<p>Virtual</p>	<ol style="list-style-type: none"> 1. Importance of and strategies for strengthening tobacco cessation services to reduce the global burden of tobacco-related illnesses and deaths.