



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

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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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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 (LMIC) (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 Statal 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% (n = 4)	60.31% (n = 79)	5.34% (n = 7)	0.398	23.53% (n = 4)	11.76% (n = 2)	17.65% (n = 3)	0.774	28.90% (n = 102)	19.83% (n = 70)	9.07% (n = 32)	0.007
		2.29% (n = 3)	20.61% (n = 27)	0.76% (n = 1)		5.88% (n = 1)	5.88% (n = 1)	11.76% (n = 2)		13.03% (n = 46)	13.31% (n = 47)	5.38% (n = 19)	
		3.05% (n = 4)	61.83% (n = 81)	5.34% (n = 7)		29.41% (n = 5)	11.76% (n = 2)	23.53% (n = 4)		36.26% (n = 128)	16.43% (n = 58)	9.92% (n = 35)	
HP Coordinator in facility	No	1.15% (n = 2)	16.03% (n = 21)	0.76% (n = 1)	0.197	29.41% (n = 5)	5.88% (n = 1)	11.76% (n = 2)	0.321	18.41% (n = 65)	8.50% (n = 30)	2.27% (n = 8)	0.000
		0.76% (n = 1)	51.15% (n = 67)	3.82% (n = 5)		0% (n = 0)	5.88% (n = 1)	11.76% (n = 2)		3.68% (n = 13)	9.92% (n = 35)	4.25% (n = 15)	
		3.05% (n = 4)	19.85% (n = 26)	1.15% (n = 2)		5.88% (n = 1)	5.88% (n = 1)	17.65% (n = 3)		27.20% (n = 96)	11.61% (n = 41)	8.22% (n = 29)	
Identifiable budget for HP	No	1.15% (n = 2)	18.32% (n = 24)	3.05% (n = 4)	0.284	17.65% (n = 3)	0% (n = 0)	5.88% (n = 1)	0.180	9.92% (n = 35)	4.82% (n = 17)	3.97% (n = 14)	0.000
		0% (n = 0)	11.45% (n = 15)	0% (n = 0)		0% (n = 0)	0% (n = 0)	0% (n = 0)		0.28% (n = 1)	5.66% (n = 20)	1.42% (n = 5)	
		3.82% (n = 5)	56.49% (n = 74)	3.05% (n = 4)		17.65% (n = 3)	17.65% (n = 3)	35.29% (n = 6)		39.66% (n = 140)	20.68% (n = 73)	9.63% (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	<i>p-value</i>	Medical doctors	Nurses	AHWs	<i>p-value</i>	Medical doctors	Nurses	AHWs	<i>P-value</i>
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; Lödel 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.

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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.

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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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