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Original Article

Factors affecting Implementation of Primary Health Care Services among Nurses in Level 3 Health Facilities in Kiambu County, Kenya

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Primary Health Care, Quality Care, Implementation, Health Services, Health Facilities, Nurses.

ABSTRACT

Primary health care is instrumental to delivery of quality basic health care services in communities. Its significance lies in ensuring that appropriate basic healthcare services are offered to all who need them competently, fairly and efficiently based on a people-centered approach. The study therefore sought to assess the factors affecting implementation of primary health care services among nurses in level 3 health facilities in Kiambu County, Kenya. This was an analytical cross-sectional study conducted among 141 nurses who worked in level 3 health facilities in Kiambu County and recruited using simple random sampling technique. They responded to a self-administered questionnaire. Data was probed descriptively with measures including proportions along with counts utilizing SPSS version 25.0. Relationships in study attributes were probed with chi-square test at 95% CI with outcomes shown in tables and figures. From the findings, majority (91.5%, n = 129) of the nurses rated the level of implementation of primary health care services in their workstations as sub-optimal. The factors found to strongly correlate with the poor implementation of the primary healthcare services were inadequate number of available healthcare personnel (p = 0.002); poor or low remuneration of healthcare providers (p = < 0.000); poor supply of essential medicine/drugs (p = 0.011); unavailability of essential medical equipment (p = 0.000); poor planning of the PHC programs (p = 0.024); lack of or inadequate support to HCPs from the hospital management (p = 0.013) and significant underfunding of the primary health care services (p = 0.001). Efforts are therefore required on the part of relevant stakeholders in Kiambu County to address the various factors that impede effective delivery of primary health care services.

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INTRODUCTION

Primary health care (PHC) is described by the World Health Organization (WHO) as a health pathway that goes beyond the conventional healthcare system by emphasizing social justice and health equity. Through community participation and collaboration, PHC promotes a people-centered approach to healthcare that includes promotional, preventive, curative, and rehabilitative services (WHO, 2019). Emphasis on implementation of PHC in modern days is critical on 3 grounds - the characteristics of PHC enable the healthcare system to respond and adjust to an intricate and constantly shifting world; with its focus on health prevention and promotion, attempting to address wellbeing related factors, and a person focused perspective, PHC has demonstrated its efficiency and efficacy in resolving core origins and attributable factors leading to illnesses, and addressing rising difficulties likely to jeopardize health in coming years; and that health for all in the form of UHC and the health-based sustainable development goals (SDGs) would be accomplished via greater attention on PHC services (Jamison et al., 2018; Assefa et al., 2020).

Available evidence illustrates that effective implementation of PHC services leads to reduction of the global burden of wellbeing related morbidity and mortality; right quality, efficient and affordable care for individual persons and the society; greater equitable distribution of health care services; empowerment of persons, households and general community to actively partake in decision making regarding their wellbeing; improvement of health throughout people's lives from birth to old age and better population health outcomes at lower cost (Talbot & Verrinder, 2017; Hone et al., 2018; Assefa et al., 2020). This notwithstanding, levels of implementation of PHC services remain underwhelming in many countries globally with huge disparities noted between the developed and developing countries (Behera & Prasad, 2021). For instance, high levels of implementation of PHC services are noted in developed nations like Australia and the Netherlands, Switzerland, Norway and Luxembourg at above 90% as well as in US, Austria, Germany and Singapore at 80 - 90%. However, implementation of PHC services is lowest in low-income countries largely in sub-Saharan Africa (SSA), South Asia and Latin America regions at below 50% (WHO, 2023).

Despite the identification of PHC as being pivotal in provision of quality healthcare services to all by 2030 as envisioned in UN's SDGs, implementation of PHC services in Kenya remains largely sub-optimal and undervalued (Otieno et al., 2020). As Kenya deals with rising health care burden arising from injuries/road traffic accidents as well as contagious and non-contagious illnesses (NCDs), the need for an effective PHC system cannot be overemphasized (MoH, 2021). Consequently, as Kenya rolls out the universal health coverage (UHC), effective implementation of PHC services is now more crucial than ever as a foundation for a sustainable health system and health programs (Otieno et al., 2020). The nation is presently at a point of demonstrating that PHC implementation offers the most appropriate route of realizing the "Health for All" goal thanks to prevailing government dedication seen via fair resource allocation through the devolution of health services (WHO, 2017). In view of this, the study examined factors

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affecting implementation of PHC services among nurses who worked in level 3 health facilities in Kiambu County. The study's aims therefore included to establish the factors affecting implementation of PHC services among nurses in level 3 health facilities in the county and to identify perceived areas of improvement in the implementation of primary health care services as reported by the nurses.

Materials and Methods

Research Design*:* The study utilized an analytical cross-sectional study design.

Study Area*:* The study was carried out in level 3 health facilities in Kiambu County. Kiambu County is one of Kenya's 47 counties located central of the country. The county has 24 level 3 health facilities providing varied PHC services to its residents. Level 3 health facilities in Kiambu County constituted a suitable study setting as these facilities provided largely PHC services.

Study Population and Sample: Nurses working in level 3 health facilities in Kiambu County constituted the study population. An aggregate of 148 nurses selected using simple random sampling technique were enrolled into the study. The sample size was determined using the Fishers et al. (1998) formula, $n_f = n / [1 + n/N]$, in which n_f = the study sample size; n = appropriate sample size for populations ≥ 10,000 (384) and N = entire study population which was 240. The sample size of 148 nurses was proportionately distributed among the 24 health facilities in the county based on the total number of nurses that each facility had.

Inclusion and Exclusion Criteria: Nurses who worked in the level 3 health facilities in Kiambu County and who consented to participating were included. However, those who were not on duty during the study period and those who were sick during the study period were excluded.

Data Management and Analysis: Data was collected using a questionnaire. The nurses responded to the questionnaire on a self-reporting basis. The questionnaire was pretested among fifteen (15) nurses who worked at the Embakasi Health Centre in Nairobi County. Validity of the study questionnaire was assessed through subject matter expert review. The questionnaire was deemed to be reliable as it yielded a high internal consistency denoted by an aggregate Cronbach alpha coefficient value of 0.891. Following the distribution of the questionnaires, the respondents were offered a period of two weeks to respond to the study tool with regular follow-ups made by the researchers to ensure sufficient response rate. Participants had to offer their informed consent to be allowed to participate. The study data was probed descriptively via proportions along with occurrence rates with correlations between the explanatory and explained variables assessed with the chi-square test at 95% confidence interval and findings reported in tables. Data analysis was performed using SPSS v. 25. Results were presented in tables and figures.

Ethical Considerations: Kenyatta University's Ethics Review Committee approved the study (PKU/2711/11835). Research permit was issued by NACOSTI (NACOSTI/P/23/26095). The study was also cleared by the Department of Health Services of the County Government of Kiambu. Participants gave their informed consent to participate and participated in the study voluntarily. They received no compensation for taking part in the study. Utmost confidence was observed for all the obtained data. Data were processed and findings reported anonymously. Safety of the collected data was guaranteed and study findings were disseminated in accordance with the institutional policies.

Results

The study achieved a 95.3% response rate as 141 nurses sufficiently responded to the questionnaire.

Demographic Characteristics of the Respondents.

Results on the respondents' demographic characteristics are as depicted in Table 1.

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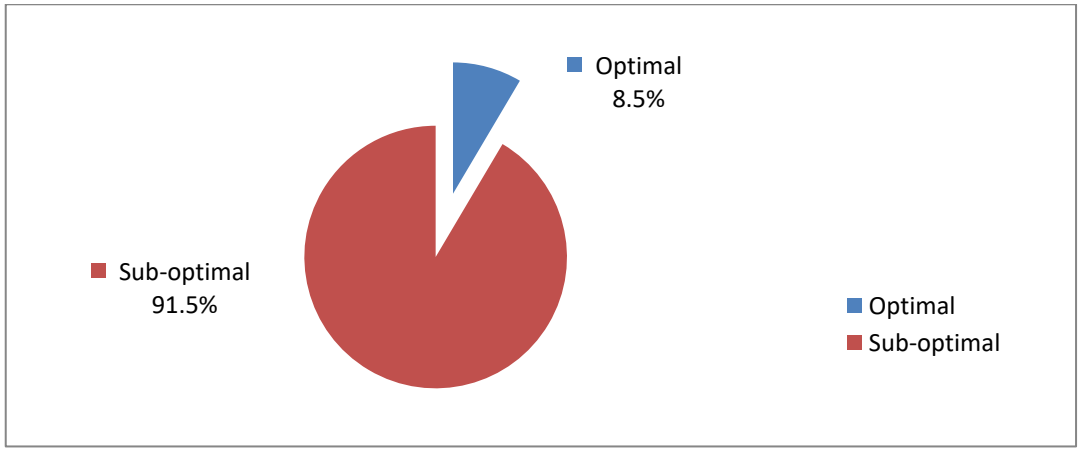
Table 1: Respondents' demographic characteristics

Demographic attributes		Frequency (n)	Percentage (%)
Gender	Male	60	42.6
	Female	81	57.4
	Total	**141**	**100.0**
Age	Below 30 years	31	22.0
	30 - 39 years	59	41.8
	40 - 49 years	38	27.0
	50 years & above	13	9.2
	Total	**141**	**100.0**
Highest education level	Certificate	11	7.8
	Diploma	89	63.1
	Higher Diploma	20	14.2
	Bachelors	18	12.8
	Masters	3	2.1
	Total	**141**	**100.0**
Marital status	Single	43	30.5
	Married	95	67.4
	Separated	1	0.7
	Divorced	1	0.7
	Widowed	1	0.7
	Total	**141**	**100.0**
Religious faith	Christianity	131	92.9
	Islam	9	6.4
	Traditionalists	1	0.7
	Total	**141**	**100.0**
Duration served as a nurse	1 - 5 years	28	19.9
	6 - 10 years	49	34.8
	Over 10 years	64	45.4
	Total	**141**	**100.0**

Nurses' implementation of primary health care services

The study evaluated the respondents' level of implementation of PHC services in the health facilities they worked in. To ascertain the level of implementation of PHC services among the respondents, the nurses were requested to indicate whether sought PHC services were offered in a timely and efficient manner with their responses used to categorize the level of PHC services implementation as optimal or sub-optimal. A majority (91.5%, n = 129) of the nurses rated the level of implementation of PHC services in their work stations as sub-optimal. This is depicted in Figure 1.

Figure 1: Respondents' rating of the level of implementation of primary health care services



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Factors that influenced implementation of primary health care services

The study sought to establish the factors that influenced the implementation of PHC services among nurses working in level 3 health facilities in Kiambu County. From the findings, the factors that hindered the implementation of PHC services within level 3 health facilities in Kiambu County as reported by the surveyed nurses are as summarized in Table 2.

Table 2: Factors that hindered implementation of primary health care services

		Yes		No	
		Freq. (n)	%	Freq. (n)	(%)
a.	Inadequate number of available healthcare personnel	140	99.3	1	0.7
b.	Poor or low remuneration of health care providers	140	99.3	1	0.7
c.	Poor supply of essential medicine/drugs	137	97.2	4	2.8
d.	Unavailability of essential medical equipment	139	98.6	2	1.4
e.	Non-functional status of existing medical equipment	139	98.6	2	1.4
f.	Poor planning of the PHC programs	135	95.7	6	4.3
g.	Lack of or inadequate support to HCPs from the hospital management	133	94.3	8	5.7
h.	Significant underfunding of the primary health services	139	98.6	2	1.4
i.	Lack of or poor information systems	139	98.6	2	1.4

Further, a statistically significant association was established between the nurses' implementation of PHC services and the identified factors including inadequate number of available healthcare personnel; poor or low remuneration of health care providers; poor supply of essential medicine/drugs; unavailability of essential medical equipment; non-functional status of existing medical equipment; poor planning of the PHC programs; lack of or inadequate support to HCPs from the hospital management; significant underfunding of the primary health services and lack of or poor information systems as denoted by chi-square p values of below 0.05 indicating that the identified factors had a significant influence on the nurses' implementation of the PHC services. Results are as shown in Table 3.

Table 3: Association of identified factors with the nurses' implementation of primary health care services

		PHC services implementation level		Chi-square	
Factors	Categories	Optimal (n = 12)	Sub-optimal (n = 129)	Statistic (X^2)	Sig. (p)
Inadequate number of available healthcare personnel	Yes	3	89		
	No	9	40	9.37	0.002*
Poor or low remuneration of health care providers	Yes	1	112		
	No	11	17	42.50	< 0.000*
Poor supply of essential medicine/drugs	Yes	2	71		
	No	10	58	6.47	0.011*
Unavailability of essential medical equipment	Yes	3	97		
	No	9	32	13.41	0.000*
	Yes	4	92		
				7.29	0.007*

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Non-functional status of existing medical equipment	No	8	37		
Poor planning of the PHC programs	Yes	5	94		
	No	7	35	5.11	0.024*
Lack of or inadequate support to HCPs from the hospital management	Yes	3	80		
	No	9	49	6.21	0.013*
Significant underfunding of the primary health care services	Yes	5	106		
	No	7	23	10.75	0.001*
Lack of or poor information systems	Yes	4	84		
	No	8	45	4.73	0.030*

* Statistically significant at 0.05 significance level

Perceived areas of improvement by nurses in the implementation of primary health care services

The study also sought to identify perceived areas of improvement in the implementation of PHC services within level 3 health facilities in Kiambu County as reported by the nurses. From the findings, the perceived areas of improvement in the implementation of PHC services within level 3 health facilities in Kiambu County as identified by the surveyed nurses included *quality of services offered* in terms of making the PHC services more accessible, consistent, equitable, responsive, efficient, timely, safe, personalized and well-coordinated; *funding of PHC services* that is making the PHC services affordable to community members; *ensuring adequacy/sufficiency of health care personnel working in PHC settings* that is ensuring that health facilities offering PHC services are adequately staffed; *ensuring adequate supply of essential medicines/drugs* that is ensuring that PHC facilities are, at all times, adequately stocked with essential medication; *ensuring adequate supply of essential medical equipment* that is ensuring that PHC facilities are, at all times, adequately equipped with essential medical equipment or tools of work; *regular repairs of existing essential medical equipment* that is ensuring that essential medical equipment in PHC facilities are maintained in good functional status at all times; *timeliness in delivery of health services* that is ensuring that PHC services are offered to patients when needed without unnecessary delays; *nurse-patient interactions/relations* that is ensuring that nurse-patient interactions are regular, clear, meaningful, respectful, compassionate and forthright and *regular audit of PHC services delivery* that is ensuring that delivery of PHC services is monitored on a regular basis to allow timely identification of any challenges for timely action to remedy or address the challenges as well as to identify opportunities for strengthening the quality of the PHC services. The results are as presented in Table 4.

Table 4: Perceived areas of improvement in the implementation of primary health care services

		Proportion of nurses who identified the factor	
		Freq.(n)	%
a.	Quality of services offered	139	98.6
b.	Funding of primary health services	138	97.9
c.	Ensuring adequacy of health care personnel working in PHC settings	138	97.9
d.	Ensuring adequate supply of essential medicines/drugs	141	100.0
e.	Ensuring adequate supply of essential medical equipment	140	99.3

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		Proportion of nurses who identified the factor	
		Freq.(n)	%
f.	Regular repairs of existing essential medical equipment	141	100.0
g.	Timeliness in delivery of health services	137	97.2
h.	Nurse-patient interactions/relations	137	97.2
i.	Regular audit of PHC services delivery	140	99.3

Discussion

Factors that influenced implementation of primary health care services

From the findings, the nurses identified inadequate number of available healthcare personnel as one of the leading factors that influenced their implementation of PHC services within level 3 health facilities in Kiambu County. Indeed, a statistically significant association was established between the nurses' implementation of PHC services and the inadequate number of available healthcare personnel (chi-square p value = 0.002). This signified that inadequate number of available healthcare personnel was an impediment to the effective implementation of PHC services among nurses working in level 3 health facilities in Kiambu County. Similarly, Chinawa (2015) and Ahmad et al. (2019) did also identify nursing staff shortages as being a leading factor that impeded effective delivery of primary health services in Nigeria. Insufficient number of health care providers was also found to a leading barrier to effective implementation of PHC services in studies by Barkley et al. (2020) and Simen-Kapeu et al. (2021).

Another major factor identified by the nurses as influencing their implementation of PHC services within level 3 health facilities in Kiambu County was poor or low remuneration of health care providers. Indeed, a statistically significant association was established between the nurses' implementation of PHC services and poor or low remuneration of health care providers (chi-square p value = < 0.000). This implied that effective implementation of PHC services by nurses working in level 3 health facilities in Kiambu County was being impeded by their low pay. Similar observations were made by Ahmed and Husein (2020) who attributed the poor delivery of PHC services in Somalia to lack of motivation among health care workers due to low remuneration. Likewise, low pay to health care providers was found to impede effective implementation of PHC services as reported in studies by Assefa et al. (2020), Sambo (2019) and Otieno et al. (2020).

Further, majority of the nurses also agreed that their implementation of PHC services within level 3 health facilities in Kiambu County was influenced by poor supply of essential medicine/drugs. Indeed, the association between the nurses' implementation of PHC services and poor supply of essential medicine/drugs was found to be statistically significant (chi-square p value = 0.011). This signified that poor supply of essential medicine/drugs was an important impediment to the effective implementation of PHC services among nurses working in level 3 health facilities in Kiambu County. The findings agreed with those of Van Weel and Kidd (2018) who argued that inadequate supplies of essential medication/drugs had adverse effects on effective delivery of PHC programs. Likewise, Sumer et al. (2019) also pointed out that inadequate facilitation of local public health facilities with essential drugs was a leading hurdle to effective PHC execution in these contexts.

From the findings, there was consensus among majority of the nurses that unavailability of essential medical equipment and non-functional status of existing medical equipment were leading factors that influenced their implementation of PHC services within level 3 health facilities in Kiambu County. Further, the association between the nurses' implementation of PHC services and unavailability of essential medical equipment as well as non-functional status of existing medical equipment was found to be consequential as denoted by chi-square p values of 0.000 and 0.007, respectively. This signified that the nurses'

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effective implementation of PHC services within level 3 health facilities in Kiambu County was impaired by both the unavailability of essential medical equipment and non-functional status of existing medical equipment. Similar views were expressed by WHO (2018) which noted that lack of or non-operational state of essential medical equipment remained a major barrier to effective delivery of high quality PHC services particularly in low resource countries. Peoples et al. (2021) were of similar views that inadequate facilitation of local public health facilities with essential medical equipment did indeed hamper effective delivery of PHC services, sentiments also echoed by Sumer et al. (2019).

From the findings, the nurses also identified poor planning of the PHC programs as another leading factor that influenced their implementation of PHC services within level 3 health facilities in Kiambu County. It was also established that there existed a statistically significant association between the nurses' implementation of PHC services and poor planning of the PHC programs (chi-square p value = 0.024). This implied that the nurses' implementation of PHC services within level 3 health facilities in Kiambu County was unfavourably influenced by poor planning of the PHC programs. Similarly, Sacks et al. (2020) identified poor planning of the PHC programs as a leading contributor to the program' poor implementation in numerous African settings. Behera and Prasad (2021) also asserted that the likelihood of success in implementation of PHC services by healthcare workers is enhanced by adequate planning of the PHC programs prior to their roll out. Adhikari et al. (2022) also underscored the significance of proper planning of PHC programs to effective implementation of PHC services.

Further, majority of the nurses unanimously agreed that their implementation of PHC services within level 3 health facilities in Kiambu County was also influenced by lack of or inadequate support to HCPs from the hospital management. Indeed, the association between the nurses' implementation of PHC services and lack of or inadequate support to HCPs from the hospital management was established to be statistically consequential (chi-square p value = 0.013). This denoted that implementation of PHC services among nurses working in level 3 health facilities in Kiambu County was unfavourably influenced by lack of or inadequate support to HCPs from the hospital management. The findings were in agreement with those of Simen-Kapeu et al. (2021) who identified lack of management support for nurses work as being a leading factor that adversely affected health care workers' delivery of PHC services in central and western areas of Africa. Myloneros and Sakellariou (2021) added that hospital's management plays a key leadership and facilitation role and their support is instrumental in ensuring effective delivery of PHC services by the healthcare workers, sentiments also shared by Alenoghena et al. (2014).

From the findings, there was unanimity among the surveyed nurses that their implementation of PHC services within level 3 health facilities in Kiambu County was influenced by significant underfunding of these services. Indeed, the association between the nurses' implementation of PHC services and significant underfunding of the PHC services was found to be statistically significant (chi-square p value = 0.001). This signified that significant underfunding of the PHC services was a major impediment to their effective implementation among nurses working in level 3 health facilities in Kiambu County. Ahmad et al. (2019) did also report that the effective implementation of PHC services in Nigeria was adversely impacted by severe underfunding of PHC services within community-based health centres. Barkley et al. (2020) also averred that adequate funding of PHC was essential for successful implementation of PHC programs and services. Ramani et al. (2019) and Adhikari et al. (2022) also implicated inadequate funding as one of the main reasons behind poor implementation of PHC services in India and Nepal, respectively.

Lastly, the nurses also identified lack of or poor information systems as another leading factor that influenced their implementation of PHC services within level 3 health facilities in Kiambu County.

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Lack of or poor information systems were likely to compromise communications, coordination and proper documentation of PHC delivery activities. Indeed, the association between the nurses' implementation of PHC services and lack of or poor information systems was found to be statistically significant (chi-square p value = 0.030). This signified that lack of or poor information systems was an impediment to the effective implementation of PHC services among nurses working in level 3 health facilities in Kiambu County. The findings agreed with those of Kluge et al. (2018) who identified a robust information system as being a critical component for effective delivery of PHC programs and activities. Likewise, Pandey (2018) argued that decisions on implementation of PHC programs should be informed by the health needs of the communities being served and thus it is imperative that health facilities should have a sound information system in place.

Perceived areas of improvement by nurses in the implementation of primary health care services

From the findings, the perceived areas of improvement in the implementation of PHC services within level 3 health facilities in Kiambu County as reported by the surveyed nurses included *quality of services offered* in terms of making the PHC services to be more accessible, consistent, equitable, responsive, efficient, timely, safe, personalized and well-coordinated; *funding of primary health services* that is making the PHC services affordable to community members; *ensuring adequacy/sufficiency of health care personnel working in PHC settings* that is ensuring that health facilities offering PHC services are adequately staffed; *ensuring adequate supply of essential medicines/drugs* that is ensuring that PHC facilities are, at all times, adequately stocked with essential medication; *ensuring adequate supply of essential medical equipment* that is ensuring that PHC facilities are, at all times, adequately equipped with essential medical equipment or tools of work; *regular repairs of existing essential medical equipment* that is ensuring that essential medical equipment in PHC facilities are maintained in good functional status at all times; *timeliness in delivery of health services* that is ensuring that PHC services are offered to patients when needed without unnecessary delays; *nurse-patient interactions/relations* that is ensuring that nurse-patient interactions are regular, clear, meaningful, respectful, compassionate and forthright and *regular audit of PHC services delivery* that is ensuring that delivery of PHC services is monitored on a regular basis to allow timely identification of any challenges for timely action to remedy or address the challenges as well as to identify opportunities for strengthening the quality of the PHC services. This showed that the perceived areas of improvement in the implementation of PHC services within level 3 health facilities in Kiambu County were diverse and touched on key domains of PHC delivery including quality and funding of PHC, ensuring sufficient supply of essential medical equipment and drugs, regular monitoring of PHC delivery and on nurse-patient interactions.

The findings concurred with those of Espinosa-González and Normand (2019) in Turkey and Assefa et al. (2020) in Ethiopia who in a review of delivery of PHC services identified the quality of PHC services offered as an area of concern which required urgent action. On their part, Behera and Prasad (2021) espoused that PHC services required to be adequately funded and supported if they are to be effectively implemented; a view also shared by Ramani et al. (2019) who argued that effective delivery of PHC services in India was being hampered by inadequate funding of the PHC programs. According to Ahmad et al. (2019), to ensure that PHC programs and interventions realize their intended goals of bringing health care services closer to those who need them, the challenge of underfunding of PHC services in local public health facilities required to be addressed. Studies by Bitton et al. (2017), Chinawa (2015) and Sacks et al. (2020) also highlighted the need for greater focus on ensuring adequate supply of essential medical equipment and drugs as well as recruitment of adequate number of health care personnel as major

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prerequisites for improving the implementation of PHC services. On their part, Sumer et al. (2019) and WHO (2023) identified timely delivery of PHC services and adequate planning of all PHC programs as areas in need of greater focus and action while Gabrani et al. (2020), Peoples et al. (2021) and Onokerhoraye (2016) all highlighted the domain of nurse-patient interactions with a view of making them more robust, positive and enriching to both parties as an area requiring greater emphasis.

Conclusions

The leading factors that hindered effective implementation of PHC services among nurses working in level 3 health facilities in Kiambu County included inadequate number of available healthcare personnel; poor or low remuneration of HCPs; poor supply of essential medicine/drugs; unavailability of essential medical equipment; non-functional status of existing medical equipment; poor planning of the PHC programs; lack of or inadequate support to HCPs from the hospital management; significant underfunding of these services and lack of or poor information systems. Further, the perceived areas of improvement in the implementation of PHC services within level 3 health facilities in Kiambu County as identified by the nurses were diverse and touched on key domains of PHC delivery including quality and funding of PHC, ensuring sufficient supply of essential medical equipment and drugs, regular monitoring of PHC delivery and on nurse-patient interactions.

The theoretical implications of the study were that effective implementation of PHC services among nurses in level 3 health facilities in Kiambu County was being hindered by a wide range of factors which could broadly be classified into health system related and nursing/healthcare personnel related. The practical applications of the study being that insights derived from the study could form the basis for action towards enhancing the implementation of PHC services in level 3 health facilities in Kiambu County, Kenya.

Recommendations

To achieve effective implementation of PHC services in Kiambu County deliberate efforts are needed to ensure that its level 3 health facilities are adequately equipped with the necessary medical equipment and drugs, sufficient numbers of HCPs and adequate funding of the PHC program. Efforts, on the part of the responsible parties, are also required to address the various areas of PHC services delivery noted as requiring improvement.

Study limitation: Views of other important stakeholders in the implementation of PHC services such as patients (as users of these services), other cadres of HCPs (as PHC service providers), the national and county governments (as funders and facilitators of the PHC services) and policy makers at various levels on the study subject were not evaluated.

Competing Interests: The authors have no competing interests associated with the material presented in this paper.

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