Relationship Between Structural Arrangement and Provision of Primary care Quality: A Case of Health Centers in Nakuru County, Kenya

Amos Kipngetich Kandagor[1*], Wanja Mwaura-Tenambergen[1], Eunice Muthoni Mwangi[1]

[1]Department of Health Systems Management, Kenya Methodist University, Nairobi Kenya

*Corresponding Author: Department of Health Systems Management, Kenya Methodist University, Email: kandamos@yahoo.com

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Abstract

Introduction: Healthcare is a fundamental need, its availability and comprehensiveness helps in making people's life better and productive. Delivery of quality care requires an efficient system with adequate capacity of well trained and motivated health workforce, good infrastructure, good leadership and governance and effective system for financing primary care. This study aimed at finding out the relationship between structural arrangement and provision of primary care quality in Kenya and majorly focused on the public health centers in Nakuru County. **Methods:** The study used census research design. A total of 102 respondents comprising technical health workers were included in the study. Data was collected using closed and open ended questionnaire and was analyzed using SPSS. Descriptive analysis was used to profile the characteristic of the respondents. Mean standard deviation and correlation was used to perform analysis of the extent to which each independent variable was considered significant in influencing provision of quality primary care service. **Findings**: Adequate infrastructure led to an increase in provision of primary care quality in health centers ($r=0.453$, $P<0.001$), while increased employee capacity improved provision of primary care quality ($r=0.365$, $P<0.001$). Sufficient fund and effective financial management improved provision primary care quality ($r=0.567$, $P<0.001$) and effective governance improved provision of primary care quality ($r=0.613$, $P<0.001$). **Conclusion**: The results show that good infrastructure, sufficient funds, high staff capacity, transparency and accountability improved primary care service delivery. Good structures lead to good processes and ultimately good health outcome. Provision of equipment's to perform the necessary work, adequate allocation and timely release of funds to health centers, career progression and continuous professional development, institute staff retention measures and frequent auditing of assets and liabilities and report made public.

Key words: Structural Arrangement, Primary care, Quality, Governance, Infrastructure, Nakuru County, Kenya

Introduction

Health system consists of all organizations, people and actions whose primary intention is to promote, restore or maintain health. The goal is to improve health through provision of service in an equitable manner in a way that is responsive, cost-effective and efficient use of available resources. World Health Organization "Framework for Action" describe six health system building block that make up a entire system, the building blocks include: service delivery, health workforce, health information, health financing and leadership and governance. Service delivery include providing quality healthcare service which is safe, effective and personalized care to those who need at the right time and ensuring resources are well utilized (World Health Organization. (WHO), 2007).

World Health Organization Sustainable Development Goal (SDG, 2015) number three, states that to attain healthy lives and promotion of well-being, proper structural arrangements must be set up in primary care system. Quality care is regarded as providing care in a way that is integrated, accessible, comprehensive and provided by clinician who is able to meet the healthcare needs of the patient and involve family in care and treatment Molla, Donaldson, Karl, Yordy, Kathleen & Neal, 1990;World Health Organization.(WHO), 2008a).

There has been commitment worldwide to make primary care a foundation of healthcare systems, this is due to the increasing data relating primary care to improved health outcomes, reduced health disparities and reduced healthcare costs (Macinko, Oliveira,Turci,Guanais, Bonolo & Lima-Costa,(2011); Kringos, Groenewegen, Wienke & Hutchinson, (2010); Lee, (2007); Starfield, Shi,.& Macinko,(2005) demonstrated that the stronger the country's primary care structure, the better the health outcomes. It was associated with low mortality and morbidity rates especially on chronic diseases.

Kenya has agreed to support primary care strategic approach to healthcare system as declared by WHO (WHO, 1978). During the Alma-Ata Declaration WHO emphasized the importance of primary care as a key policy to achieve health for all by the year 2000, Kenya has gradually expanded primary care delivery to increase availability, accessibility and comprehensive of health care services including preventive and curative health services. This was made possible through effective policies, administration and political commitment in decentralization of health services to improve access. Kenya's health care system is provided by over 4,800 health facilities spread across the country, the facilities consists of National referral hospitals, County referral hospitals, Sub-county hospitals, health centres, and dispensaries. Health centres and dispensaries are first point of contact between patient and healthcare system. However, little is known about the quality of primary care service in Kenya, particularly from the perspective of health providers despite major evidence linking primary care characteristic to improved health outcome (Kringos et al., 2010; WHO, 2008b).

Two theoretical models was used to guide the research, the Donabedian model of quality assessment (Donabedian, 1980) and Primary Care Quality (PCQ) (Starfield, 1998). To assess

quality one must have a scientifically sound conceptual and operational definition. The definition of quality have remained vague, for the purpose of this research quality is defined based on the setting (primary care) and health provider point of view (Campbell, Roland, and Buetow, 2000; Donabedian, 1988).

Methods

Research Design

Census design involving use of questionnaire to collect data from respondents. According to Sekaran, descriptive research helps to understand the characteristics of a group in a situation of interest, aid in thinking systematically about aspects in a given situation and offer ideas for further probing and research (Sekaran& Bougie, 2009). The population include clinical officers, Nurses, laboratory technologist and pharmaceutical technologist.

Sample Size Determination and Sampling Procedure

This is a census and hence all the 40 health centers in Nakuru County were considered. The population of this study was put into different strata based on different department within the health centre. From each strata a convenient sampling method was used to determine the sample population for staff from each of the department. The study sample composed of 17 Clinical Officers, 52 Nurses, 11 laboratory Technologist and 11 Pharmaceutical Technologist.

Data collection procedures

The study used both primary and secondary data. Primary was gathered by use of closed and open ended questionnaire, which were self-administered. The Secondary data was collected from reports and journals. Pretest of the research instrument was conducted at three health centers in Kiambu County. A reliability coefficient of 0.833 was achieved upon the correlation of the responses. Data was collected in January and February 2019 from 33 site visit and administered the questionnaires.

Data Analysis Technique and presentation

Quantitative Data was analyzed using Statistical Package for Social Sciences (SPSS) version 20. The test statistics used were mean score, Pearson's Rho(r) and P-value. Where the P-value was below 0.05 the study concluded that there was statistical significance. A 5-point likert scale ranging from 5 representing "Strongly Agree" in descending order to 1 representing "Strongly Disagree" were used for descriptive statistics. A mean score above 3.4 indicates agreement while those below 3.4 indicates disagreement in the statements.

Ethical consideration

The research obtained approval from Kenya Methodist University Scientific Ethics and Research Committee, The National Commission for Science, Technology and Innovation and the Nakuru County Scientific Research and Ethics Committee. Informed consent was obtained from the respondent and all information collected was kept confidential.

Results

Table 1: Demographic Characteristics of the Respondents

	Characteristic	Frequency	Percentage
Setting Type	Urban	58	60.42
	Rural	17	17.71
	Semi-urban	21	21.88
Type of Respondent	Clinical officer	17	16.67
	Pharmaceutical technologist	11	10.78
	Nurse	52	50.98
	Lab technologist	11	10.78
	Other type of respondent	11	10.78
Who Owns the Facility	Government	99	97.06
	Municipality	2	1.96
	Religious group	1	0.98
Level of Education	Masters	1	0.99
	Bachelor's degree	16	15.84
	Diploma	80	79.21
	Certificate	4	3.96
Gender	Male	35	34.65
	Female	66	65.35
Current Employment Status	Permanent	54	52.94
	Temporary	44	43.14
	Part-time	4	3.92
Years Worked in the Health Center	< 1 year	21	20.59
	1-2 years	34	33.33
	2-3 years	16	15.69
	>3 years	31	30.39

The overall findings of the questionnaire reliability analysis revealed that the tool reliable with a coefficient of 0.833. Table 1 presents the demographic findings. Majority of the respondent were female 65.35(65%) while 34.65(35%) being male. Half 52(50.98%) of the respondents were Nurses, 80(79.21%) of the respondents were diploma holders in diverse fields of study and 81(79.41%) have served for more than one year.

Descriptive statistics Variable

A 5-point likert scale ranging from 5 representing "Strongly Agree" in descending order to 1 representing "Strongly Disagree" were used for descriptive statistics.

Infrastructure

On whether there was enough equipment in the health centers to serve all patients, the study found out that most of the equipment including Thermometers, Blood pressure machine and weighing scale for under 5 years was available and functional as shown in Table 2.

Table 2: Medical Equipments and Sources of Funds

Equipment's	**Available**		**Not Available**	
	Frequency	**Percent**	**Frequency**	**Percent**
Thermometer	87	88	12	12
Computers	49	49	50	51
Blood Pressure machine	85	87	13	13
Nebulizer	46	46	51	54
Refrigerator	90	93	7	7
Delivery bed	56	57	43	43
Weighing Scale under 5 years	91	92	8	8
Source of Funds	**Agree**		**Disagree**	
	Frequency	**Percent**	**Frequency**	**Percent**
Fees charged to patients	27	28%	71	72%
Health system budget	70	71%	29	29%
Targeted program / activity funding	52	53%	46	47%

Most of the respondents 50(51%) reported that there was lack of computers at the health centers and 51(54%) reported nebulizing machine not available. On the sources of funds, the health systems budget from national government was the major source of fund 70(71%), targeted programs from the government or development partners was said to provide a considerable amount of funds to support operating costs 52(53%).

Management of funds

Majority of respondents 88(89%) agreed that inadequate finance affected reliability in delivery of quality primary care service (**Table 3**). Further, there was an agreement 81(82%) that use of fixed budget minimized effectiveness and quality of primary care offered by the health centers. Similarly, most respondents 76(77%) agreed that allocated funds were used for the intended purpose. However, respondents generally disagreed 54(55%) on whether there was timely disbursement of government funds for purchase of commodities.

Table 3: Management of funds and Staff Capacity in **Health Center**

Financial management	**Agree**		**Disagree**	
	Frequency	**Percent**	**Frequency**	**Percent**
Inadequate finance affects reliability in delivery of primary care service	88	89	11	11
Use of fixed budget minimize effectiveness and quality of primary care offered by the health center	81	82	18	18
There is timely disbursement of government funds	45	45	54	55
Allocated funds used for the intended purpose	76	77	23	23
Staffing	**Agree**		**Disagree**	
	Frequency	**Percent**	**Frequency**	**Percent**
The number of staff in the health center is always sufficient to cover the current workload.	26	26	73	74
The health center management has continuous medical education sessions for its staff	79	80	10	20
Whether training play a significant role in delivery of primary care quality	90	91	9	9
Scheme of service exist for health workers	69	70	29	30

On staff capacity, most respondents 90(91%) were in agreement that training plays a significant role in delivery of quality primary care. Table 3 shows a large proportion of respondents 79(80%) observed that health center management have continuous medical education sessions for its staff; and that scheme of service exists for health workers 69(70%). On the contrary, there was a disagreement, 73(74%) of the respondents, that the number of staff in a health center was always sufficient to cover the current workload.

Transparency and Accountability at the Health Centres

There was a strong agreement 87(88%) that transparency was key in improving the governance of health care resources as shown in **Table 4**. Further, there was agreement that, the health centers had explicit facility service charter at 89(90%), the facilities have a system where users have full access to necessary information on acts and procedures done 68(69%) and the health centers have systems for recording user's views, suggestion or complaints regarding access to services at the health center 76(77%).

Table 4: Transparency at the Health Centers

Transparency at the Health Centers	Agree		Disagree	
	Frequency	Percent	Frequency	Percent
The health center has explicit facility service charter	89	90	10	10
The health center has a system for recording users views, suggestion or complaints regarding access to services	76	77	23	23
The facility has a system where users have full access to necessary information on acts and procedures done	68	69	31	31
Transparency is key to improve the governance of health care resources	87	88	12	12
Accountability at health center	**Agree**		**Disagree**	
	Frequency	**Percent**	**Frequency**	**Percent**
The community take part in budgeting and expenditure tracking	72	74	26	25
The facility timely submits data and information to relevant bodies and Authorities	92	94	6	6
The health facility management consist of a community representative	92	93	7	7
The health center provide care to a defined population in its catchment area	63	65	35	35
The finances and other health center resources are well controlled through facility committees	76	77	23	23

With regard to accountability at health center majority of the respondents 72(74%) agreed that health facility management consisted of a community representative. Further, respondents identified timely submission of data and information to the relevant bodies and authorities as an important aspect of accountability 92(94%), followed by involvement of community in budgeting and tracking of expenditure by 92(93%) and good control of finances and other health center resources through facility committees by 73(77%).

Scores of Performance Indicators

The study sought to find the average scores of all indicators used to measure the perceptions on the infrastructure, human resources, financial resources, governance in the health center facilities and quality of primary health care. The scores were generated from an average of the perception levels from 1 strongly disagree to 5 strongly agree. The score averages were then converted to dummy variables of above average or below average. If the average was above 3 it was considered above average while an average equal or less than 3 was considered below average as presented in **Table 5.**

Table 5: Performance scores

Variable	Above average		Below average	
	Frequency	%	Frequency	%
Infrastructure Score	91	92	8	8
Human Resource Score	81	82	18	18
Financial Resource Score	80	81	19	19
Governance Score	87	88	12	12
Primary Care Quality Score	91	92	8	8

Overall, the primary care quality in the health centers was ranked highly with 92 (92%) of the respondents agreeing that it is above average. For the other performance indicators infrastructure resources was rated highest by 90(92%) of the respondents, then followed by governance by 87(88%) and human resources was the next by 81(82%). Finally, financial resources were rated as the least performing aspect of primary care quality by 81(81%) of the respondents.

Relationship Between the Performance Indicators and Quality of Primary Care

The finding in **Table 6** shows there is a significant relationship between primary care quality and the selected indicators of performance.

Table 6: Relationship between the performance indicators and quality of primary care.

Variable		Primary Care Quality		χ^2	P value
		Below average (n=8)	Above average (n=94)		
Infrastructure Score	Below average	25	6	3.535*	0.060
	Above average	75	94		
Human Resource Score	Below average	50	15	6.252**	0.012
	Above average	50	85		
Financial Resource Score	Below average	62	15	11.023***	0.001
	Above average	38	85		
Governance Score	Below average	50	9	12.226***	0.001
	Above average	50	91		

*** Correlation is significant at 1%

** Correlation is significant at 5%

* Correlation is significant at 10%

A higher proportion of a certain indicator being above average resulted in a high significant relationship between the indicator and primary care quality. This implies that the selected indicators significantly influenced the primary care quality in the health facilities. The relationship between governance and financial resources and the quality of primary care were both significant at 1% significance level. Human resource and infrastructure resources also had a significant relationship with quality of primary care at 5% and 10% significant levels respectively.

Bivariate Linear Correlation Analysis

To determine whether each of the independent variable in this study, infrastructure (X_1), financial resources (X_2), staffing (X_3), and governance (X_4) influences the provision of quality healthcare services (Y), a bivariate linear correlation analysis was carried out. The results for each variable are given by Pearson Correlation (r) and its corresponding p-value. If the P-value is less than 0.05, then the relationship is statistically significant (**See Table 7**).

Table 7: Bivariate Linear Correlation

		Primary care Quality	Infrastructure	Human Resource	Financial Resource	Governance
Primary Care Quality	Pearson Correlation	1				
	Sig. (2-tailed)					
	N	102				
Infrastructure	Pearson Correlation	0.453	1			
	Sig. (2-tailed)	0.000				
	N	102	102			
Human Resource	Pearson Correlation	0.365	0.462	1		
	Sig. (2-tailed)	0.000	0.000			
	N	102	102	102		
Financial Resource	Pearson Correlation	0.576	0.647	0.439	1	
	Sig. (2-tailed)	0.000	0.000	0.000		
	N	102	102	102	102	
Governance	Pearson Correlation	0.613	0.477	0.522	0.649	1
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	
	N	102	102	102	102	102

Correlation is significant at the 0.01 level (2-tailed).

Correlation is significant at the 0.05 level (2-tailed).

The study revealed moderate positive and significant correlation between primary care quality and infrastructure(X_1), (*r=0.453, p<0.01*). Similarly, there was a moderate and significant positive correlation between primary care quality and human resources(X_2), (*r=0.365, p<0.01*). More human resources reduce workload per health worker hence the workers will concentrated in fewer duties that are more specialized and increasing the quality of the output they provide. On the other hand, there is a strong and significant positive correlation between primary care quality and financial resources(X_3), (*r=0.567, p<0.01*). The finding indicated that compared to the other three key independent variables influencing quality of primary care, governance factors(X_4) had the strongest and significant positive correlation (*r=0.613, p<0.01*). Better governance lead to improved management, efficiency and transparency.

Multiple Regression Analysis

A multiple regression analysis was applied to determine structural factors affecting provision of primary care quality in public health centers in Kenya.

Linear regression used in this model was:

$Y = \alpha + \beta X_1 + \beta 2X_2 + \beta 3X_3 + \beta 4X_4 + \mu$

Where Y= Dependable variable, Provision of quality primary care service, α = Constant, β= Coefficient of the factors, X_1= Infrastructure, X_2= Financial resources, X_3= Staff capacity, X_4= Governance, μ= Error Term

$Y= -4.151+0.076x_1+0.320x_2+0.153x_3+2.490x_4$

Table 8: Structural factors and their Influence on Primary Care Health Quality

	Coefficient	Standard Error	P-value
Infrastructure	0.076	0.084	0.367
Financial resource	0.320**	0.135	0.021
Staff capacity	0.153	0.128	0.238
Governance	2.490***	0.438	0.000
Constant	-4.151	1.013	0.000

Where X_1 =Infrastructure, X_2= Financial resource, X_3= Staff capacity and X_4=Governance
The values 0.076, 0.320, 0.076 and 0.076 are coefficients.

The study put all variables on the same scale and compares the magnitude of the coefficients of the independent to determine which one had more effect on delivery of primary care quality. The large betas were associated with low p-values. The column of coefficient shows the predictor variables of constant, staffing, financial resource, infrastructure and Governance. The last variable constant of -4.151 represent the constant which predict value of primary care quality when all other variables affecting primary care quality was constant at Zero (0). From the above regression, it was found that provision of primary care quality

service in health centers would be at -4.151 holding infrastructure, financial resource, staffing and governance constant at Zero (0). Improved investment in infrastructure would lead to an increase in provision of primary care in the health center by 0.076 units while increase in financial resource allocation to health centers would lead to an increase in provision of primary care quality service by 0.320 units. The study also found that staff capacity influences quality of primary care service, an increase in number of health providers would lead to increase provision of primary care quality by 0.153 units while better governance of the health centers improve provision of primary care quality service by 2.490 units. This study revealed a positive relationship between infrastructure, staff capacity and provision of primary care service quality, while positive and strong relationship between financial resources, governance and provision of quality primary care services with a p-value 0.021, 0.000 respectively at 95% confidence level.

Discussion

Majority of the respondent agreed on availability of thermometers, blood pressure machine, refrigerator and weighing scale for under 5 years. The finding concurs with Smee, (2000) and Koenig et al., (2009) on the need to support health facilities with necessary tools and equipment. Institutions using computers are able to manage and evaluate performance of their care (Lamarche et al., 2003).

Results on source of funds showed a disagreement that fees charged to patients constituted a significant part of the operating costs 72(72%). The findings concurs with Muiya & Kamau, (2013) that fees charge on patients are obstacle to healthcare access. The results on management of funds concurred with earlier study which found financial management being a barrier to other functions of quality service provision (Adams & Colebourne 1989). Use of line item budget has been associated with bureaucracy and inflexibility in optimal use of resources to meet urgent needs of the health centers (Peters et al., 2000).

Shortage of health providers may adversely affect the quality of services rendered at the health facilities. The results coincides Cohen & Levinthal (1990) who stated that health centers must improve its human resource capital to achieve effective health outcome. A study by Ndetei et al., 2008; Brown & Duguid, 1991) established that inadequate training and limited professional development opportunities was a factor influencing retention of health workers at the primary care facilities.

The finding on transparency and accountability at the health centres concurs with Decoster et al., (2012) on accountability and efficient use of resources. Transparency eliminates corruption and positive health outcomes is seen on patient (Baez-Camargo & Pamela, 2011). Vian, (2012) found active disclosure of information supports clients access full information about the actions and procedures of the health centers hence enhance quality of care.

The aspect of health facility providing care to a distinct population in its locality, though important, was considered the least important in enhancing accountability at the health facility by 63(65%) of the respondents. The finding disagrees with Smee, (2002) who indicated that most developing lack capability to manage its resource. Baez-Camargo & Pamela (2011) found that when accountability is strengthened, the opportunity for corruption and bad governance is eliminated and positive health outcome is achieved.

Based on the four study objectives, the study found out that better infrastructure led to improved quality of primary care ($r=0.453$, $p<0.01$). Infrastructural resources including appropriate work space, Information communication and technology (ICT), modern equipment and machinery are key in delivering quality primary care. This finding concurs with WHO (2010) that infrastructure is the major driving force to primary care provision.

The study established that use of fixed budget ensured good expenditure control and less administrative work though it offers little incentive to health workers to maximize the effectiveness of healthcare delivery, fixed budget encourages inequities and fail to respond to new demands and priorities to ensure optimal use of inputs. Poor financial management affects other functions of healthcare that contribute to quality service delivery. The study found insufficient funds lead to purchase of poor quality medical supplies, poor staff payment leading to demotivation and poor maintenance of existing equipment($r=0.320$, $p=0.021$).

This finding concurs with Isik *et al.* (2008) who found that financial difficulty can significantly affect quality and amount of services and can lead to different methods of practice. From the finding, the study revealed that the number of staff in the health centers was not adequate to cover the current workload, the results was in line with Argote and Ingram, (2001) who found the need for selective employment of qualified and high skilled workforce for provision of quality healthcare. Continuous medical education meeting and training was found to play a significant role in delivery of quality healthcare. The finding also established that lack of scheme of service for health workers led to lack of clear job description and specification of duties and responsibilities within the career structure which ensure proper deployment and utilization of health providers towards delivering quality healthcare service.

The finding on accountability shows a similar trend as those found by Decoster & Hill, (2012) who stated health reforms must consider accountability. The finding revealed public participation improved delivery of quality primary care service, it created an environment in which governing actions are fair, inclusive and trustworthy; it makes the health center processes legitimate, open, transparent and responsive to the needs of the citizens. Availability of patient tools including participatory budgeting, public expenditure tracking, citizen report card, service charter, community monitoring, public hearing and social audits contributed to improved governance and effective service delivery and empowerment.

Similar findings were reported by Baez-Camargo (2011) who stated strengthening facility accountability eliminate corruption and improve governance outcome.

The study finding also established demographic factors affect delivery of quality service, the gender, level of education and years worked at the health center contributed to high skilled workforce with expertise who natures work experience among the new staff, those who served more than 2 years were competent and well adapted to handle local health issues. This study established existence of a positive relationship between structural arrangement and provision of quality primary care service in the health centers, it clearly indicated that better infrastructure, adequate funds, increase employee capacity and good governance positively affect delivery of quality primary care service. The finding concurs with (Sohnen, 2015) healthcare financing as critical to other key functions therefore there is need to adequate fund health care.

Conclusions

This study found statistical and significant evidence that infrastructure, funding mechanism, staff capacity and governance in a combined relationship significantly influence the provision of quality primary care in public health centers in Kenya. The study infers that improvement in health infrastructure, efficient funding mechanism, building staff capacity and good governance would lead to quality primary care services at public health centers in Nakuru County.

Recommendations

i) The Government should adopt modern technology, purchase new equipment, supply essential medicine and repair damaged equipment.
ii) The Government should increase funding to health centers and ensure timely disbursement in order to promote other functions of healthcare service delivery.
iii) The county should ensure effective recruitment, retention and training of new employees through continues professional development to reduce the workload ratio and monitor staff to ensure they meet performance standard.
iv) The health providers and management should ensure transparency and accountability is maintained at all times.

Competing interests

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