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Original Research Article

Factors influencing upward referral system of patients in Nairobi County

Tenambergen Wanja, Kezia Njoroge, Epony N. Osoro*

Department of Health Systems Management and Medical Education, Kenya Methodist University, Nairobi, Kenya

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***Correspondence:**
Epony N. Osoro,
E-mail: eponyk@gmail.com

ABSTRACT

Background: The referral system forms main health systems coordinating a mechanism ensuring the harmonious movement of patients between different levels of health care institutions for effective and efficient service delivery. The study aimed at establishing the determinants of upward referral system of patients in Nairobi County.
Methods: Cross-Sectional data collected from 204 respondents from 2 May to 30 June, 2021, through a structured questionnaire from level 3-5 public facilities in Nairobi County was used. Data was analyzed using SPSS. Doctors, nurses and clinical officers who have referred patients in the previous three months were included while those who had not were excluded.
Results: Bivariate analysis results revealed that knowledge of referral system ($r=179^{*}$, $p=0.011$) and complexity of patient disease ($r=097$, $p=0.170$) had positive and significant correlation with upward referral system. Multivariate analysis results showed that proximity to the referral health facility had positive and statistical significant ($\beta_4=0.640$, $p<0.002$) to upward referral system.
Conclusions: The results revealed that although healthcare workers know about the referral strategy, they lack full comprehension of the referral strategy. Patients are mostly referred when higher diagnostic equipment are needed and when the medical conditions are dire. The study recommends professional medical education to equip the human resources for health with the requisite knowledge on the referral system and establishment of effective communication systems between the lower levels health facilities and the higher or specialized facilities to ensure there a smooth referral system in Nairobi County.

Keywords: Upward referral system, Knowledge of referral guidelines, Complexity of disease, Equipment required, Proximity to referral hospital, Nairobi, Kenya

INTRODUCTION

The referral system forms main health systems coordinating a mechanism that ensures the harmonious movement of patients between different levels of health care institutions for effective and efficient service delivery. It refers to a situation where health facilities in the lower level without the technical-know-how and equipment required for treatment advice patients to seek for treatment from higher health facilities with better medical technology and technical skills.[1,2] Patient movement along the referral system is a day-to-day process within the health care setting and is an essential aspect in service delivery within the health sector. There are two types of medical referrals: Horizontal (referrals among health facilities of same level and vertical (referrals among health facilities of different levels). The healthcare system in Kenya has six levels as stipulated in the Kenya health policy 2014-2030 which are segmented into four tiers: tier I-community, tier II-dispensaries & health centres, tier III-County hospitals and tier IV-

National referrals.[3] There are numerous organizational factors associated with causing bottle necks in referral system across the 4 tiers of healthcare system. not much is known about this therefore the study was able to venture more on these contributing factors to enable policy makers reach informed decision. An effective referral system in any health system for service provision was aimed at facilitating harmonious liaison for the healthcare levels and patients getting required treatment at their convenience.[4] Healthy referrals should be to enable patients get the needed healthcare at affordable prices, instill cost-effectiveness in all its components and timely dispensing of treatments.[2] However, this is not the case in the health referral system in Nairobi County. Kenyatta national hospital (KNH) operates beyond capacity around the year despite there being other referral hospitals in the county. KNH has a bed capacity of 1,800 beds with the average daily number of out-patients ranging from 2,500 and 3,000. This implies a bed utilization rate of over 170%, which sometimes can stretch to 300%.[5] Many patients who seek treatment at Kenyatta National Hospital could be attended to tier III or even lower level health facilities. The high number of patients cause delay for patients suffering from complicated health problems, which ideally require specialized care. The study sought establishes the factors influencing upward referral system of patients for health service delivery in Nairobi County. Specific objectives were to establish the influence of knowledge of referral system, complexity of the disease, equipment required, and proximity to the referral hospital on upward referral system of patients in Nairobi County.

METHODS

This study adopted descriptive-cross sectional research design. The study site was Kenyatta National hospital, in Nairobi Kenya. The study sample was 239 respondents who were health workers in tier 2 and 3 health facilities in Nairobi County. Quantitative data was collected using a structured questionnaire which was self-administered. The questionnaire was pre-tested to ascertain validity and reliability of the tool. Data was analyzed using SPSS version 25 for descriptive and inferential statistics. Correlation and regression analysis were employed to test the influence of independent variables on the dependent variable. The regression model to measure the predictive power of the independent variables on the dependent variable was formulated as:

$$Y = \beta 0 + \beta 1X1 + \beta 2X2 + \beta 3X3 + \beta 4X4 + \varepsilon$$

Where; Y=Upward movement for service delivery; X1=Knowledge of the referral system, X_2=complexity of the disease; X_3=equipment required; X_4=proximity to the referral hospital; $\beta 1$, β_2, β_3 and β_4=coefficients of determination and ε=error term. Research permit was obtained from the National commission for science, technology and innovation, Kenya, Nairobi County health office, and management of health facilities. Informed consent was sought from all respondents.

RESULTS

A total of 239 questionnaires were distributed but only 204 (85%) were fully filled and complete and included in this analysis. Social-demographic characteristics are presented in (Table 1).

Table 1: Socio-demographic characteristics.

Characteristics	N	%
Respondents' sex		
Male	88	43
Female	116	57
Respondents' age (years)		
18-29	18	9
30-39	130	64
40-49	38	18
50-59	18	9
Highest level of education		
Diploma certificate	119	58
Higher National diploma	46	23
Bachelor's degree	32	16
Profession		
Doctor	22	10
Nurse	150	74
Clinical officer	32	16
Length in years the current position		
<2	34	17
3-5	99	49
6-9	31	15
>10	40	19
Years of work experience		
<2 and below	4	2
3-5	49	24
6-9	55	27
>10	96	47
Department of work		
Paediatrics ward	16	8
Casualty department	40	20
Medical ward	32	16
Outpatient	45	22
Surgical ward	25	12
Maternity	18	9
Eye ward	4	1
Labour ward	24	12
Health facility level		
Level 3	67	33
Level 4	53	26
Level 5	84	41

Findings show that nearly half 84 (41%) of the respondents were from level 5 health facilities. Most respondents 150 (74%) were nurses by profession, 130 (64%) were aged 30-39 years, 116 (57%) were female and 119 (58%) had a diploma level of education. About

half 99 (49%) had worked in their current facilities for 3-5 years and 96 (47%) had more than 10 years' work experience. The respondents were asked to indicate whether they were aware of the existence of Kenya health sector referral guidelines. Results show that all the respondents were aware of the existence of Kenya health sector referral guidelines. However, just slightly over half of the respondents 109(53%) of the respondents said they always followed the referral guidelines set while referring a patient to a higher health facility level. The study further sought the respondent's knowledge of the upward referral system. The results are shown in (Table 2).

Table 2: Respondents knowledge of upward referral system (n=204).

Statements	SD	D	N	A	SA	Mean	Std. Dev.
	N (%)	N (%)	N (%)	N (%)	N (%)		
I am fully aware of the content in the referral strategy	4 (2)	38 (19)	83 (41)	53 (26)	26 (13)	3.2892	0.97742
The referral strategic document is always available for reference	15 (7)	42 (21)	87 (43)	31 (15)	29 (14)	3.0833	0.90437
We always keep a copy of the referral strategy in the department	12 (6)	52 (26)	85 (42)	26 (13)	29 (14)	3.0392	0.99113
The referral guidelines are easy to understand	20 (10)	59 (28)	82 (40)	21 (11)	22 (11)	2.8431	0.99405
I have read the referral strategic plan	12 (6)	102 (50)	50 (25)	27 (13)	13 (6)	2.6422	0.99970
We always refer to the strategic plan during the referral	31 (15)	70 (34)	68 (33)	24 (12)	11 (5)	2.4784	0.95454
We always have continuous medical education on efficient referral systems	23 (11)	89 (44)	60 (29)	18 (9)	14 (7)	2.4637	0.93193
I have been trained on the referral strategy	19 (9)	110 (54)	41 (20)	17 (8)	17 (8)	2.4245	0.95251
I have been trained to be a gatekeeper in the health system with regard to referral system.	60 (29)	62 (30)	57 (28)	13 (6)	12 (6)	2.2892	0.93158

SD=Strongly disagree, D=Disagree, N=Neutral, A=Agree, SA= Strongly agree

Results show that majority of the respondents disagreed that they were fully aware of the content in the referral strategy (mean=3.2892), that the referral strategic document is always available for reference (mean 3.0833), that they always have a copy of the referral strategy in the department (mean 3.0392), that the referral guidelines were easy to understand (mean 2.8431), that they always have continuous medical education on efficient referral systems (mean=2.4637). The findings imply that the healthcare workers were not knowledgeable of the referral procedures as stipulated by the referral guidelines and strategies. The study asked the participants to indicate their degree of agreement to statements on upward referral system (Table 3). Results show that the respondents disagreed that they often had to decide if to refer or not which was a delicate balance between quality and safety of healthcare (mean=3.2745) and that they always had to consult their peers before referring a patient (mean=3.1127), that they always refer patients in order to share responsibility on patient care (mean=2.7598) and that they sometimes hesitate to refer patients because of fear of being branded incompetent by colleagues or supervisors (mean=2.5294). In addition, the respondents disagreed that they often refer patients in order to conform to institutional expectations (mean=2.2255), that they often refer patients in order to have time to take care of other issues (mean=2.0343) and that they hesitate to refer because they always find writing a referral note to be tedious (mean=1.9853).

Moreover, the respondents strongly disagreed that they always encouraged to refer patients because of fear of cost of treatment (mean=1.8186) and that they were always encouraged to refer patients because their insurance does not cover treatment costs at our facility (mean=1.6078). This implies that although the respondents were not aware of the referral guidelines as shown in (Table 2), they understand the ethical issues behind the referral system. The study determined reasons why healthcare workers did not follow the set referral guidelines when referring a patient to a higher health facility level. See (Table 4). Results show that majority 173 (85%) of the respondents indicated inadequacy of time to follow set guidelines as a reason for not following the set referral guidelines. Further, 66 (32%) indicated that they were not sure about what the guidelines stipulates and that the disease was very severe and was a life-threatening condition as indicated by 114 (56%). Moreover, 113 (55%) of the respondents indicated that patient insisted to be referred and nearly half 114 (56%) said there was poorly coordinated referral system in the facility. The respondents were asked whether there was any inappropriate referrals that have happened in their health facility. Nearly all 186 (91%) of the respondents indicated that there were unnecessary referrals within their facilities, more than half 116 (57%) said that there was poor quality of referral documentation and 140 (69%) indicated that there was lack of communication during the referral process.

Table 3: Respondents reasons for upward referral.

Statements	SD	D	N	A	SA	Mean	Std. Dev.
	N (%)	N (%)	N (%)	N (%)	N (%)		
I often have to decide if to refer or not which is delicate balance between quality and safety of health care.	12 (6)	25 (12)	81 (40)	67 (33)	19 (9)	3.2745	0.99414
I always have to consult my peers before referring a patient.	36 (18)	19 (9)	67 (33)	50 (25)	32 (16)	3.1127	0.79113
I always refer patients in order to share responsibility on patient care.	27 (13)	62 (30)	66 (32)	31 (15)	18 (9)	2.7598	0.83439
I sometimes hesitate to refer patients because of fear of being branded incompetent by colleagues or supervisors.	50 (25)	44 (22)	70 (34)	32 (16)	8 (4)	2.5294	0.83785
I often refer patients in order to conform to institutional expectations.	66 (32)	51 (25)	62 (30)	25 (12)	0 (0)	2.2255	0.93540
I often refer patients in order to have time to take care of other issues.	67 (33)	81 (40)	42 (21)	10 (5)	4 (2)	2.0343	0.95402
I hesitate to refer because I always find writing a referral note to be tedious.	81 (40)	51 (25)	66 (32)	6 (3)	0 (0)	1.9853	0.91769
We are always encouraged to refer patients because of fear of cost of treatment.	113 (56)	39 (19)	25 (12)	27 (13)	0 (0)	1.8186	0.97888
We are always encouraged to refer patients because their insurance does not cover treatment costs at our facility.	127 (62)	40 (20)	27 (13)	10 (5)	0 (0)	1.6078	0.89505

SD=Strongly disagree, D=Disagree, N=Neutral, A=Agree, SA= Strongly agree

Table 4: Reasons for not following referral guidelines.

Parameters	Yes		No	
	N	%	N	%
Inadequate time to follow set guidelines	173	85	31	15
Not sure about what the guidelines stipulates	66	32	138	68
Disease was very severe/ faced with life-threatening condition	114	56	90	44
Patient insisted/ self-referred themselves	113	55	91	45
Poorly coordinated referral system	114	56	90	44
Lack of effective referral system monitoring	76	37	128	63

On complexity of patient disease during referral, the respondents agreed that they often referred a patient when they felt a case was beyond their capacity to handle (mean=3.9167) and that most patients they referred were of clear-cut situations (mean=3.4245) (Table 5). The respondents however, disagreed that they are often faced with complex cases which needed immediate referral (mean=3.3775) and that they often referred patients with chronic disease (mean=2.9265). Results on the influence of equipment required for specialized treatment on upward referral are shown in (Table 6). Results showed that the respondents agreed that there were sophisticated diagnostic technologies at the referral hospitals (mean=3.7451) and that there were more advanced therapeutic technologies at the referral hospital (mean=3.6814). However, the respondents disagreed that the hospital were well equipped with critical care beds and ventilators (mean=3.2794); and that they have necessary equipment within their health facility (mean=3.0000). The influence of proximity to the referral hospital by the referring health workers showed that most agreed they always consider distance to the referral facility in order to reduce cost of utilization of health services by the patient (mean=3.8627), and that costs of transportation to reach health facilities affects referral of patients (mean=3.7745). The respondents however disagreed that patient's decline referral due to the distance to the referral hospital (mean=3.3039). The study sought to establish the relationships that existed between the study variables. The results on bivariate analysis are shown in (Table 7). Findings on knowledge of referral system show a positive and significant correlation with upward referral system ($r=179^{*}$, p=0.011) In addition, findings on complexity of patient diseases how a positive and significant correlation with upward referral system (r=097, p=0.170). However, equipment required and proximity to the referral hospital had a positive relationship to upward referral system but it was not statistically significant. A general linear model was used to determining the projective influence of the four independent variables in the upward referral system of patients. Coefficient of determination (R^2) gives an interpretation of the degree of change in the dependent variable explained by the changes in the independent variables or the variation in percentage of the dependent

variable (upward referral system); as interpreted by the study's independent variables (proximity to the referral hospital, equipment required, complexity of patient disease and knowledge of referral system).

Table 5: Complexity of patient disease during referral.

Statements	SD N (%)	D N (%)	N N (%)	A N (%)	SA N (%)	Mean	Std. Dev.
I often refer a patient when I feel the case is beyond my capacity to handle.	15 (7)	4 (2)	31 (15)	87 (43)	67 (33)	3.9167	0.80437
In my current work place, we often have simple patient cases which don't need referral.	7 (3)	33 (16)	41 (20)	78 (38)	45 (22)	3.5931	0.90358
Most patients I refer are of clear-cut situations	4 (2)	8 (4)	97 (48)	67 (33)	28 (14)	3.4245	0.85061
I am often faced with complex cases which need immediate referral	7 (3)	21 (10)	93 (46)	54 (27)	29 (14)	3.3775	0.96729
I often refer patient with chronic disease	11 (5)	57 (28)	82 (40)	44 (22)	10 (5)	2.9265	0.95179
Most patients with chronic cases who attend who come to our facility often need referral.	19 (9)	52 (26)	78 (38)	51 (25)	4 (2)	2.4480	0.96819
I always refer patient because I am not sure if I have the latest treatment guidelines.	68 (33)	64 (31)	42 (21)	26 (13)	4 (2)	2.1863	0.99392

Table 6: Equipment required for specialized healthcare.

Statements	SD N (%)	D N (%)	N N (%)	A N (%)	SA N (%)	Mean	Std. Dev.
There are more sophisticated diagnostic technologies at the referral hospital	0 (0)	23 (11)	39 (19)	109 (53)	33 (16)	3.7451	0.86173
There are more advanced therapeutic technologies at the referral hospital	0 (0)	25 (12)	48 (24)	98 (48)	33 (16)	3.6814	0.88860
Our health facility is well equipped with critical care beds and ventilators	25 (12)	25 (12)	64 (31)	53 (26)	39 (19)	3.2794	0.94978
There is necessary equipment available within our health facility	8 (4)	47 (23)	97 (48)	41 (20)	11 (5)	3.0000	0.89882
We have highly trained health workers on handling the various critical care equipment	37 (18)	39 (19)	97 (48)	6 (3)	25 (12)	2.7206	0.86829
Equipment within our health facilityare functioning properly	64 (31)	29 (14)	54 (27)	36 (18)	21 (10)	2.4127	0.95808
There are more sophisticated diagnostic technologies at the referral hospital	0 (0)	23 (11)	39 (19)	109 (53)	33 (16)	3.7451	0.86173

Table 7: Bivariate analysis; all variables (n=204).

Independent variables	Upward referral system	
	Pearson correlation (r)	P value
Knowledge of referral system	0.179*	0.011
Complexity of patient disease	0.097	0.170
Equipment required	0.066	0.352
Proximity to the referral hospital	0.181**	0.410

*Correlation is significant at the 0.05 level (2-tailed).
**Correlation is significant at the 0.01 level (2-tailed).

Results on the model summary revealed that the four independent variables in the study can explain about 82% of factors that influence upward referral system in Nairobi County. Further ANOVA results showed that the model was statistically significant in the prediction of the magnitude and direction of the influence that proximity to the referral hospital, equipment required, complexity of patient disease and knowledge of referral system had upward referral system in Nairobi County ($p<0.0001$) and $F=14.922$) at 5% significance level. A multivariate regression analysis was done to establish the degree to which independent variables in a combined relationship influenced upward referral system in Nairobi County. The results are shown in (Table 8). In this study the regression equation is:

$$Y = \beta 0 + \beta 1X1 + \beta 2X2 + \beta 3X3 + \beta 4X4 + \varepsilon$$

Becomes:

$$Y = 1.472 + 0.743\,X1 + 0.715X2 + 0.735\,X3 + 0.640\,X4 + \varepsilon$$

Table 8: Coefficient of determination.

Model	Unstandardized coefficients		Standardized coefficients	T	Significance
	B	Std. Error	Beta		
Constant	1.472	0.366	-	4.022	0.000
Knowledge of referral system (X_1)	0.743	0.044	0.240	3.236	0.171
Complexity of patient disease (X_2)	0.715	0.084	0.097	1.367	0.113
Equipment required (X_3)	0.735	0.059	0.166	2.280	0.136
Proximity to the referral hospital (X_4)	0.640	0.066	0.148	2.109	0.002

The constant (β_0) is also positive and significant ($p< 0.001$), which indicates that upward referral system will always exist at a certain minimum even without the one factor (proximity to the referral hospital) under investigation in this study. The coefficient of X_4 that is (β_4=0.640, $p<0.002$), indicates that a unit increase in the proximity to the referral hospital index leads to an improvement of the upward referral system. However, the other factors (knowledge of referral system, complexity of patient disease, and equipment required), under investigation in this study revealed a positive significant but had no statistical significant upward referral systems in a combined relationship.

DISCUSSION

The results showed that need for advanced diagnostic and therapeutic equipment influenced the need for upward referral in Nairobi County. The findings are agrees with that the need for diagnostic tests influenced the upward refferal of patients in the Malaysian referral system[6]. In addition the findings are rejected the findings bythat screening, diagnosis and assessment of respiratory diseases did not influence the upward reffearal of patients in Catalonian health referral system.[7] Further the findings rejected the findings of a study bythat life support equipments did not influence the upward movement of patients in the referral system of Brazil.[8] Finally, the findings are in agreeement with the findings of a stsudy by that a significant positive connection exited between the support equipment and upward movement of patients in the referral system of the United Kingdom.[9]

In this study proximity of the referral hospital influenced upwards referral system. The findings of the study are contrary to the findings by that the geographical distance to the referral hospital insignificantly influenced the upward movement of patients in the Ugandan referral system.[10] However, they agree with findings by that the distance from primary healthcare centers vis-a-vis the distance from referral hospitals significantly influenced upward movement of patients in the referral system.[11]

The findings on knowledge on referral to influence the upward movement of patients in the referral system have also been corroborated.[12] Further, findings by found that knowledge of the transfer system had positive significant influence on upward movement of patients in the referral system in the rural societies.[13] The findings on complexity of the patient disease in this study disagree with a study that found chronic health conditions played a significant role in the movement of patients from care providers to referral hospitals in the USA.[14] In addition, the findings are contrary to the findings by chronic health conditions is statistically significant in determining the upward movement of patients within the Iowa's referral system.

On the influence of equipment on upward referral systems, the findings agreed with the findings by that screening, diagnosis and assessment of respiratory diseases did not have any significant influence on the upward movement of patients in Catalonian health referral system.[15] In addition the study findings agreed with the findings that life support equipment had a negative influence on the upward movement of patients in the referral system of Brazil.[16] Also the study findings did not agree that there was a positive and significant influence of the life support equipment and upward movement of patients in the referral system of the UK.[9] Further the study findings are contrary to the findings that the geographical distance to the referral hospital insignificantly influenced the upward movement of patients in the Ugandan referral system.[10]

Also the study findings agreed with the findings a study that the distance from primary healthcare centers vis-a-vis the distance from referral hospitals significantly influenced upward movement of patients in the referral system.[11] The study findings agrees with that provision of health care services is done at different levels and is determined by the kind of healthcare intervention that is needed by the patient.[17]

Findings agree with that referral can be explained as the process where health service provider at lower tier hospital for the lack of capabilities, resourceful facilities or both in the management of a specific clinical issues, request for help from providers who are equipped better or with specialized training to take them through the management or the treatment or to take over the treatment process as a whole.[11] Moreover the study findings agrees with the study that concluded that the improvement of quality and the raised rates of referrals is likely to promote the rates of utilizing the health care services.[18]

Limitations

The study had limitations that it focused only on public health facilities within Nairobi County. For this reason, the findings should be generalized with caution.

CONCLUSION

The study concludes that the healthcare workers were not fully aware of the content in the referral strategy and that the referral strategic document was not always available for reference by the health workers. The respondents often referred patients when they felt a case was beyond their capacity to handle, most patients they referred were of clear-cut medical cases and they referred patients because they did not have the latest treatment guidelines. The study concludes that there were sophisticated diagnostic technologies at the referral hospitals which also prompted the workers to refer patients. Proximity to the referral health facility played an important role in upward referral systems in Nairobi County. In summary, it therefore follows that, this study found statistical and significant evidence that proximity to the referral hospital in a combined relationship, significantly influences the upward referral systems in Nairobi County.

Recommendations

The study recommends that the Nairobi County Health Department should organize professional medical education to equip heath workers with update knowledge on an efficient referral system, the health facility management should ensure that each department in its facility has a copy of the referral policy and the Nairobi County Health Department should improve the communication systems between the lower levels health facilities and the higher or specialized facilities to ensure there a smooth referral system in Nairobi County

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