Journal Homepage: -www.journalijar.com

INTERNATIONAL JOURNAL OF ADVANCED RESEARCH (IJAR)

Article DOI:10.21474/IJAR01/19273
DOI URL: http://dx.doi.org/10.21474/IJAR01/19273

RESEARCH ARTICLE

CORE MANAGERIAL COMPETENCIES IN THE UPTAKE OF COVID-19 VACCINE AMONG FIRST-LINE NURSE MANAGERS IN NYERI COUNTY, KENYA: A DESCRIPTIVE CROSS-SECTIONAL STUDY

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Sadly, Esther Opisa passed away on 15th April 2024

Manuscript Info

Manuscript History
Received: 12 June 2024
Final Accepted: 14 July 2024
Published: August 2024

Key words: -
Core Competencies, First Line Nurse Manager, Covid-19 Vaccine, Nyeri County

Abstract

Introduction: First-line nurse managers play significant role in directing patient care and creating safe working environment for nurses. During the COVID-19 Pandemic, nurse managers played a major role in promoting vaccine confidence and administration. This study aimed to establish core competencies that nurse managers in Nyeri County utilized to promote vaccine uptake.

Methods: Descriptive cross-sectional design was used in all health centers and dispensaries providing COVID-19 Vaccine. The total number of participants was 73. A validated model tool for evaluating nurses' managerial competencies was used. Sociodemographic characteristics were analyzed using descriptive statistics of: frequency and percentages. Core competencies were analyzed and prioritized using analytic hierarchy process (AHP). Data was presented in tables. Ethical guidelines were upheld and approval obtained from DeKUTISERC, NACOSTI, and the Nyeri County Health Department.

Results: Majority (77%, n=56) of participants were female, (43%, n=31) aged <40 years, (77%, n=56) had a diploma in nursing. The nurse managers gave highest priority competency to self-management (0.2834). For organizing function competencies, delegating roles and functions had highest priority (0.4720). For managerial roles, attitude towards continuous improvement was regarded as the most important competency (0.2630). Generally, for COVID-19 vaccine uptake, the nurse managers mostly gave the highest priority to competencies in control function (0.4470).

Conclusions: The first-line nurse managers in Nyeri County played an important role in COVID-19 vaccine uptake by effectively implementing the control managerial function. Continued capacity building on managerial competence is highly recommended for all first-line nurse managers in the county and in all other counties in the country.

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Introduction:-

First -line nurse managers provide administrative and clinical leadership, planning and managing resources, organizing nursing care,teamworking, evaluations, and contributing tooptimal results for organizations and patients [1]. These managers direct patient care and create safe working environment for nurses[2]. They are also referred to as head nurses [3]. Not only do they accomplish their clinical practices and administrative tasks, but also ensure execution of vision, values and objectives of their organization [1], [2]. Themanagers therefore, require severalmanagerial competencies for effectivepatients' outcome and uptake of healthcare services [4], [5].

Managerial competence is theapplication of knowledge, attitudes, and skills to effectively carry out duties of clinical leadership and organisation[6]. Management is theplanning, budgeting, staffing, measuring performance, and problem-solving. Leadership entails motivating people to pursue a common goal through vision, communication and inspiration. Duties in management and leadership require knowledge of finance, strategy and human resource management [3]. Studies among first-line nurse managers report that the most applicable core competencies skills are management skills [4]. These skills include; planning, organising, leadership and control. Under each category, specific competencies that have been ranked highly are: strategic thinking, resource allocation, professionalism and performance evaluation [2].

The first-line nurse managers link nurses under their supervision to access of information and resources during crisis[7]. Theyliaise between patients, staff and administration in ensuring efficient flow of information to properly run a hospital[4]. During the COVID-19 pandemic, nurses accounted for nearly 60% of the healthcare workforce and provided about 90% of primary healthcare services globally including immunizations[8]. Vaccination was the main preventive measure recommended thus leading to global campaigns meant to achieve targeted uptake level in every country [9]. However, COVID-19 vaccine did not receive immediate acceptance, majorly in sub-Saharan Africa. In Kenya vaccine hesitancy was reported to be 36.5% [10]. There was an urge to promote vaccine confidence and acceptance to communities already prejudiced against it due to misinformation and mistrust [11].

Nurses led in alleviating fears and hesitancy of clients and colleagues through proper education, promoting vaccination and enhancing community's confidence. They also led in accepting vaccination which contributed to global nurses' vaccination rate of 77.4% [12]. Nurses under the supervision of the first- line managers spearheaded promotion of patients' confidence in addition to administering the vaccine [10], [11]. In Kenya, Nyeri county received the honor for leading in uptake of the COVID-19 vaccine with a coverage of 53.8% in the county far beyond the countrywide uptake of 34.4% (MOH, 2022). For this success, nurse managers needed to utilize their competencies to provide oversight and direction throughout the vaccination period. This study, therefore, sought to establish the main competencies that nurse managers in Nyeri County utilized to promote Covid-19 vaccine uptake.

Materials and Methods:-

Study design and study site:

A descriptive cross sectional study design was used. The study sites were all health facilities providing COVID-19 Vaccine at lower levels of health care delivery (health centers and dispensaries).

Study population:

Included all first line nurse managers at study sites providing COVID-19 vaccine within Nyeri county.

Sampling technique:

The use of complete enumeration method gave all nurse managers who consented an opportunity to participate.

Sample size:

The total number of participants was73.

Objectives:-

The broad objective was to establish the main competencies that nurse managers in Nyeri County utilized to promote Covid-19 vaccine uptake. The specific objectives were:

(i.) To determine the demographic characteristics of the first line managers at the study facilities

(ii.) To study the additional training possessed by the first-line managers at the study facilities that promoted Covid-19 vaccine uptake.

(iii.) To evaluate the 27 core managerial competencies required by head nurses that promoted Covid-19 vaccine uptake.

Study variables:
The independent variables were demographics, additional training and core managerial competencies. Demographics included: gender, work station, age, professional qualification, employment status, years of experience and other administrative roles. Additional training encompassed: infection prevention and control, leadership and management, on job training, public finance management, supervisory skills, and TB training. Core managerial competencies comprised of: planning, organizing, leadership, and control. The dependent variable was uptake of Covid-19 vaccine among first-line nurse managers in Nyeri County.

Study tool:
A comprehensive model for assessing managerial competencies of nurse managers and which had been used effectively and recommended in other studies[13], was adopted. Reliability of thetool had an internal consistency of Cronbach's alpha of 0.93 and reproducibility of 0.89 [2]. The validated tool has a total of 27 managerial competencies categorized in four main functions (including planning, organizing, leadership and control). The attributes were rated using five-step Likert scale (1 = excellent, 2 = very good 3 = moderate, 4 = poorly 5 = Soo poorly). In addition, the tool incorporated demographic data of age, work place, marital status, nursing education level, employment status, and number of years in nursing practice.

Pretesting:
Was done with 10% of participantsfor the feasibility, applicability and clarity of the tool and to estimate needed time to complete the tool. The reliability assessment of the tool confirmed its internal consistency (Cronbach's alpha = 0.96).

Bias:
The bias that might have arisen from the self-evaluation during data collection was addressed by encouraging the respondents to be frank when completing the twenty-seven components of the core managerial competencies. This ensured that they were not too critical in evaluating themselves while minimizing the chances of them not actually evaluating all their competencies.

Data collection procedure:
Participants were approached in the health facilities by research assistants, informed onpurpose of study and then given written informed consent to sign before engagement. The respondents were afterwards given the self-administered questionnaires to fill.

Data management, analysis and presentation:
Data collected was checked, cleaned, coded and designed in a format for entry into Microsoft Excel and analyzed using STATA version 11.2. Data on sociodemographic characteristics was analyzed using descriptive statistics in the form of frequency and percentages. The core competencies were analyzed and prioritized through analytic hierarchy process (AHP). Data was presented in tables.

Ethical considerations:
Ethical clearance was obtained from Dedan Kimathi University of Technology Institutional Scientific Ethical Review Committee (DeKUTISERC-DeKUT/ISREC/03422/003) while permission and authority to conduct the study was sought from the Department of health services, Nyeri County and all ethical principles were followed in accordance with the Declaration of Helsinki.

Results:-

Sociodemographic characteristics:
Out of the 116 potential respondents, 63% (n=73) participated in the study. The majority (77%, n=56) of the participants were female while the majority (60%, n=44) were managers in dispensaries, and 40% (n=29) reported that they worked in health centers. Approximately a third (42%, n=31) were aged below 40 years. Those in the age group of 40 to 49 years were 37% (n=27). Most (79%, n=58) of the respondents were married while the majority (77%, n=56) hold a diploma in nursing. Concerning employment status, the majority (79%, n=58) of the participants reported being permanently employed. More than a third (38%, n=28) of the participants had worked for a period of

less than 5 years. The majority (68%, n=50) indicated that they were not engaged in other administrative roles as shown in **Table 1**.

Additional training:
Of all the respondents, 67% (n=49) had received various types of training in addition to their basic training in Nursing. Among those with extra training, 42% (n=27) had done their additional training in less than a year. Only one participant (1.4%) reported having a post-graduate certificate in leadership and management. On the other hand, 39% (n=19), had been trained on infection control as shown in **Table 2**.

Core managerial competencies:
In this study, 27 managerial competencies that are required for head nurses were identified and grouped into 4 main categories that relates to the management functions as follows; planning, organizing, leadershipand control. In addition, other managerial roles are also highlighted in table 3. From the findings, the nurse managers gave the highest priority to self-management (0.2834) and lowest priority to management of organizational climate and culture (0.0027). Further within the three defined competencies for control, self-management was ranked highly (0.6340) while performance evaluation was ranked least (0.1740). Of the competencies that fell under the organizing function, delegating roles and functions had the highest priority (0.4720) while resource allocation has the least (0.0840). Among competencies relating to the planning function, all the competencies were ranked equally (0.3330) while for those under leadership function, professionalism was mentioned as the most important competency (0.2920) and management of organizational climate and culture as the least important (0.0190). Formanagerial roles, attitude towards continuous improvement was regarded as the most important competency (0.2630) and analytical competency as the least important (0.0430). Generally, the nurse managers in this study mostly gave the highest priority to competencies in control function (0.4470), while they gave the least priority to those in the organizing function (0.1330)**(Table 3).**

Discussion:-

The findings indicated that majority of participantswere females and was attributed to fact that nursing profession in Kenya is traditionally dominated by females. A similar characteristic has been reported in other studies and which supported the view that nursing has mainly been a feminine profession [14], [15]. On qualification of nurse managers, majority had diploma level, indicating the need to encourage nurses to further their education given that more managerial competencies are likely to be achieved in a higher level of training. In addition, advanced degrees equip the nurses with more current management roles and exposure through continued evidence-based research. This finding concurredwith a study done in Finland where majority of nurse managers had attained a diploma in Nursing and few had degree or postgraduate training [3]. In addition, only one nurse manager had a specific training on leadership and management, further necessitating the need for higher training of nurse managers in Nyeri County. Literature shows that a lack of leadership and management training among nurse managers is seen as a hindrance to demonstration of managerial competencies[6]. This is because little or no training offers no exposure to current competent skills on how to plan, organize, control and lead the junior nursing staff. The results demonstrated that majority of participants worked in the dispensaries which represented level II and the remaining worked in health-centers which represented level III. The smaller number of nurse managers in health-centers as compared to dispensaries portrayed the fact that nursing managerial roles of facilities tend to be shifted to other cadres present in the health-center but absent in the dispensaries. This finding had no matching relationship from results of other studies.

This study found that control functions of management were the most critical competencies, with self-management being ranked first while feedback and performance evaluation were ranked second and third respectively. Self-management entailed taking responsibility for personal well-being during the pandemic, performance evaluation involved recognizing and improving nursing efforts while feedback was reflected on how responses from managers got to other nurses. This finding corraborated with a study that showed how nurses experienced fear of the unknown and many had concern for protecting themselves and their family from the risk of being infected by COVID-19[16].In another study, self-management was prioritized as part of the biopsychosocial well-being of nurse managers who were frontline health care providers [17]. Due to the highly infective nature of COVID-19, control functions of both human resources and commodities played a crucial role to contain the progression of the disease. However, providing feedback and evaluating performance are part of employee-oriented leadership approaches that are highly recommended in management of any given pandemic [18]. Effective feedback ensures there is proper

decision making by nurse managers. It also facilitates employee well-being through support, and coping strategies. Moreso, feedback is important for accurate communication and clarity.

Leadership competencies were not ranked highly in this study. This could be attributed to the fact that majority of the nurses may not have been exposed to leadership development during their basic nursing training. Another possible reason is supported by the fact that diploma in nursing focused more on clinical skills rather than leadership roles. These results differed with a study done in Spain, which ranked leadership second in terms of nurse core competency managerial skills [19]. This disparity in Spain could be attributed to the fact that majority of respondents had post-graduate qualifications of masters (68%, N=34) and PhD (28%, N=14) which had more inclination on leadership roles.Similarly, a study by Moghaddam et al [2] ranked leadership highly regarding it as the most important in encouraging subordinates in moving toward determined goals. Finding of this study concur with findings of a study done in Indonesia, where leadership was ranked fourth while applying quality care improvement was ranked first [6]. This may be attributed to the factors such as performance appraisal and training in management that were highlighted in the Indonesia study and which may not be the case in Nyeri County. Though in Nyeri county study, the association was not assessed, the descriptive finding indicated that only one nurse had a training on management while in Indonesia more than a half of the respondents had attended management training[6]. Similar findings were reported in Ghana where concerns for quality was rated highly [14]. Planning competencies had the same weight. This indicated that the nurse managers in Nyeri County had the ability to anticipate and prepare for the challenging COVID-19 pandemic.Studies indicates their equal significance in any nursing managerial position, since these are the areas where managers spend most of their time [14]. In terms of COVID-19 vaccination, the two managerial functions were not outstanding compared to control functions.

Although organizing functions weighed the lowest compared to the rest, delegating roles and functions was rated highly compared to coordination and resource allocation within organizing functions. The nurse managers in Nyeri County may have focused more in ensuring vaccination took place in their facilities by the junior nurses. This clearly indicated that the managers valued delegating task to others, an aspect that has been reported as very critical in a study by Choi, Wong, et al., [15]. Delegation is highlighted as key in developing nurses' potential for better management of health care in addition to enabling nurse manager to role model the lower cadre nurses through job delegation [15]. Delegation by nurse managers has also been recommended as it improves team nursing that enhances resource allocation that was likely to affects patient,nurses and organizational outcomes during COVID-19, a life-threatening pandemic [20].

This studies therefore established the key role of managerial competencies in managing an epidemic and more so in improving uptake of services such as vaccination. The role that nurses managers played to manage the COVID-19 pandemic in Nyeri county demonstrate the need for counties as well as other countries to invest in nursing workforce so as to have a stronger healthcare system and make a positive impact on health [21].

Conclusion:-

The first line nurse managers in Nyeri County played an important role in Covid-19 vaccine uptake by effectively implementing the key managerial functions more so control function. Continued capacity building on managerial competences is highly recommended for all first line nurse manager in the county and in all other counties in the country.

Limitations

This study was based on self-evaluationwhich may have limitations whereby the respondents may be either too critical in evaluating themselves or may not actually evaluate all their competencies. However, from organizational perspective self-evaluation may help to better understand the strengths and development needs of nurse managers, and thus increase the likelihood of managers participating in any training provided. The study was conducted in Nyeri county which may be different from other settingsbut the results may be applicable across the globe given the COVID -19 context affected every content and nurse managers offered their managerial roles and functions in administration of vaccination across the globe.

What is already known on this topic

- First-line nurse managers play significant role in directing patient care and linking nurses under their supervision to access of information and resources during a pandemic
- COVID-19 Pandemic required competent nurse managers

- Nurses under the supervision of the first- line managers spearheaded promotion of patients' confidence in uptake of the COVID-19 vaccine

What this study adds

- Control functions of management were the most critical competencies that first line nurse managers used to facilitate COVID-19 vaccine uptake
- Within organising functions of Nursing management, delegating roles and functions was rated highly compared to coordination and resource allocation
- There is need for continued capacity building on managerial competences for all first line nurse manager

Tables:-

Table 1: - Demographic characteristics of first-line managers (N=73) in Nyeri County.

Demographic characteristics		**N**	**%**
Gender	Male	17	23
	Female	56	77
	Total	73	100
Work station	Dispensaries	44	60
	Health centers	29	40
	Total	73	100
Age	<40	31	42
	40 to 49	27	37
	50 to 59	15	21
	Total	73	100
Professional qualification	Nursing degree	4	5
	Nursing diploma	56	77
	Nursing certificate	10	14
	Clinical officer diploma	3	4
	Total	73	100
Employment status	Permanent	58	79
	Contract	15	21
	Total	73	100
Years of service	0-5	28	38
	6-10	17	23
	11-15	14	19
	16-20	7	10
	21-25	3	4
	26-30	3	4
	>30	1	1
	Total	73	100
Other administrative roles	Yes	23	31
	No	50	69
	Total	**73**	**100**

Table 2: - Additional training received by the participants (N=49) in Nyeri County.

Additional training	**No of participants**	**Percentage**
Infection control	19	39
Financial management	7	14
Covid 19 vaccination	4	8
Leadership and management	3	6
Financial management/Leadership and management	2	4
Financial management/infection control	1	2
Infection Control/COVID-19 Vaccination	1	2
Infection Control/COVID-19 Vaccine Management	1	2
IPC/infection control	1	2

Leadership and management, Infection control	1	2
Leadership and management, Supervisory skills	1	2
On job training, infection control	1	2
Public finance management, Leadership and management	1	2
Supervisory skills	1	2
TB training	1	2
VHA	1	2
Tb training/Financial management	1	2
Total	**49**	**100**

Table 3: - Competencies' weights obtained from AHP method in Nyeri County.

Managerial functions and roles	**Competencies**	**Competency's weight in relative function/ role**	**Weight for managerial functions/ roles**	**Total weight of competency**	**Ranking of competency in relative function / role**	**Overall ranking of competencies**
Planning	Planning intelligence	0.3330	0.1400	0.0466	1	6
	Strategic thinking	0.3330		0.0466	1	6
	Goal setting	0.3330		0.0466	1	6
Organizing	Coordination	0.4440	0.1330	0.0591	2	5
	Delegating roles and functions	0.4720		0.0628	1	4
	Resource allocation	0.0840		0.0112	3	20
Leadership	Effective communication	0.1140	0.1400	0.016	4	16
	Team building	0.0670		0.0094	5	21
	Change management	0.0200		0.0028	8	25
	Conflict management	0.0200		0.0028	8	25
	Negotiation	0.0340		0.0048	7	24
	Management of organizational climate and culture	0.0190		0.0027	10	27
	Inspiration	0.0580		0.0081	6	22
	Trust and credibility	0.1160		0.0162	3	15
	Professionalism	0.2920		0.0409	1	9
	Commitment toward customers	0.2600		0.0364	2	11
Control	Self-management	0.6340	0.4470	0.2834	1	1
	Performance evaluation	0.1740		0.0778	3	3
	Feedback	0.1920		0.0858	2	2
Managerial roles	Problem solving	0.0880	0.1400	0.0123	5	17
	Critical thinking	0.1560		0.0218	2	12
	Systematic thinking	0.0880		0.0123	5	17
	Analytical competency	0.0430		0.006	8	23
	Information literacy	0.0880		0.0123	5	17
	Evidence-based decision making	0.1180		0.0165	4	14
	Creativity and innovation	0.1560		0.0218	2	12
	Attitude towards continuous improvement	0.2630		0.0368	1	10

Annex 1: - STROBE Statement—Checklist of items that should be included in reports of **cross-sectional studies**

	Item No	Recommendation	Page No
Title and abstract	1	(a) Indicate the study's design with a commonly used term in the title or the abstract	1
		(b) Provide in the abstract an informative and balanced summary of what was done and what was found	1
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	2
Objectives	3	State specific objectives, including any prespecified hypotheses	3
Methods			
Study design	4	Present key elements of study design early in the paper	3
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	3
Participants	6	(a) Give the eligibility criteria, and the sources and methods of selection of participants	3
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	3
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	3
Bias	9	Describe any efforts to address potential sources of bias	3
Study size	10	Explain how the study size was arrived at	3
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	3
Statistical methods	12	(a) Describe all statistical methods, including those used to control for confounding	N/A
		(b) Describe any methods used to examine subgroups and interactions	4
		(c) Explain how missing data were addressed	N/A
		(d) If applicable, describe analytical methods taking account of sampling strategy	N/A
		(e) Describe any sensitivity analyses	N/A
Results			
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	4
		(b) Give reasons for non-participation at each stage	N/A
		(c) Consider use of a flow diagram	N/A
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	4
		(b) Indicate number of participants with missing data for each variable of interest	N/A
Outcome data	15*	Report numbers of outcome events or summary measures	3&4
Main results	16	(a) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	N/A
		(b) Report category boundaries when continuous variables were categorized	N/A
		(c) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	N/A
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	3&4
Discussion			

Key results	18	Summarise key results with reference to study objectives	5&6
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	7
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	6
Generalisability	21	Discuss the generalisability (external validity) of the study results	3
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	8

*Give information separately for exposed and unexposed groups.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.

Acknowledgement:-
The authors acknowledge all the first line nurse managers who willingly participated in this study.

Conflicts of Interest
Authors declared they have no conflicts of interest.

Author Contributions
Conceptualization F.M, N.M and E.O.; methodology, F.M; data collection, N.M, F.M and E.O.; Formal analysis, F.M, E.O., and N.M.; writing—original draft preparation; F.M, E.O and N.M.; writing—review and editing; F.M and E.O. All authors critically reviewed and approved the final version of the manuscript.

Funding
This research received no external funding.

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