HEALTH PROFESSIONALS' FACTORS INFLUENCING UTILIZATION OF DISEASE CLASSIFICATION SYSTEMS IN PUBLIC HOSPITALS IN KIAMBU COUNTY, KENYA

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Abstract: Background: Despite the globally acclaimed efficacy of the ICD-10 as a tool for disease classification, existing evidence focus on quality of disease coding outcomes with limited evidence on determinants of utilization. The starting point to sustaining the quality of disease coding is establishing its utilization and its determinants. There is paucity of evidence on role of health professional factors on use of ICD systems in Kenya.

Objective: To determine health professionals' factors associated with utilization of ICD-10 in Public Hospitals.

Methods: This study was conducted in Kiambu County, Kenya among public health facilities. Cross-sectional descriptive study design was used. A total of 46 health records and information officers [HRIOs] were sampled using total population sampling. Data was collected using self-administered questionnaires. Descriptive statistics, chi-square and regression analysis was used to analyse and synthesis the data using SPSS version 22.

Results: Out of the 42 respondents, 28 (67%) indicated that the systems were utilized either frequently or always. Chi-square analysis revealed that ICD perception was the only health professional factor significantly associated with ICD-10 utilization. Positive perception of ICD-10 utility increased the likelihood of its frequent use by approximately 4.63 times (OR = 4.63; p=0.049).

Conclusion: Staff perception of ICD systems is an important determinant of its utilization. Providing tailored capacity building and sensitization of ICD system benefits and value-add to staff can significantly counter negative perceptions and improve utilization in hospitals.

Keywords ICD-10, Health Professionals' Factors, Disease Coding, Utilization, Public Hospitals

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Introduction

Background of the study

Diagnostic information dates back to 1850's, where the focus was on death-related information capture. The International List of causes of Death was the first one to be developed at the time, leading to its adoption by the International Statistical Institute after a couple of decades. In 1948, World Health Organization (WHO) started using the International Classification of Diseases (ICD) and was solely responsible for its further development. The WHO soon expanded the system and incorporated the classification of diseases. Two decades later, the World Health Assembly adopted ICD usage in member countries for the classification of morbidity and mortality causes [1].

The degree and accuracy of disease classification is hugely dependent on the quality of data collection. While it is one of the most basic steps in data management process, it is extremely vital in the long run. Improvement of service quality by policy makers, decision makers, and health providers all rely on timely an accurate data to inform their decision [2]. The impact that quality data has on the socioeconomic and environmental situations makes it a priceless entity in the disease classification process as well. The uses of input from health data span broad applications such as analysis and prediction of outcomes, policy creation and amendment, and trend establishment of mortality and diseases outbreaks [3]. Barriers relating to social and economic status, as well as geographical, hinder the access to quality health data. Most of the challenges in heath data relate to their methods of collection, which are more often than not paper-based or manual. Additionally, there is often a lack of structure and standards for collecting data in manual systems, leading to difficulties in synthesis of that kind of data [4]. Quan et al. presented that that just like it is possible to improve data collection methods and quality, improvement of disease classification is equally or even much more useful and possible [5]. According to the authors, this improvement can be achieved through widespread campaigns and training. According to Caskey et al., training is important for improving people's skills especially in the process of executing their tasks [2]. The ultimate goal of training would be to change in a group people, in terms of behaviour and thinking, for the realization of a more efficient performance [5].

The growth in implementation and usage of disease classification in the past couple of decades has been exponential. More and more, health institutions have the support of global organizations such as World Health Organization [6]. Classification of diseases when properly implemented and fully utilized often translates into efficiency of the services offered in hospitals as well as better setup of evidence-based structures for disease management [7]. Despite the globally acclaimed efficacy of the ICD-10 as a tool for disease classification, not enough emphasis is laid on the quality of disease coding. The starting point to sustaining the quality of disease coding is establishing its utilization [8]. For instance, in Africa, only South Africa has properly structured standards for guiding the utilization of ICD-10 in clinical coding [9]. Kenya, therefore, falls under the many nations lacking genuine national standards for ICD-10 usage, tailored to the local challenges. Additionally, the training methodologies and programmes available locally leave gaps on the trainees that usually need to be filled on the job [10]. Whilst the quality of training is a concern to many in the field of disease and medical procedure classification who are already practicing, a more prominent problem is in the lack of information on the level of ICD-10 usage within the local context [11]. The utilization of ICD-10 in Kenya's public hospitals is still low given that most of facilities below level 4 hardly classify diseases [12] Resultantly there is limited structured data available on specific diseases such as rheumatic and paediatric diseases [13]. There is also a dearth in the information regarding utilization of ICD-10 in the East African region. As such, this study aimed to establish health professional factors that influence the utilization of disease classification in Kiambu County, Kenya.

Methodology

Study Design

A cross-sectional descriptive design incorporating use of quantitative methods was employed. Kiambu County had 14 level 4 health facilities or higher – 3 level 5 hospitals and 11 level 4 hospitals. A total government employee population in these hospitals is 2700, and comprised the study population. It is from this study population that the sample size was derived. Each of these hospitals had a facility in charge, and the county also has Health records and information officers who were not based in any particular health facility. A census sampling design was used to enlist all the 46 HRIOs in hospitals level 4 and 5 in Kiambu County for the self-administered questionnaires.

Data entry and cleaning was done in MS Excel. Pre analysis was conducted to check for inconsistencies, incorrect and missing data. Quantitative data was analysed using SPSS version 12 a data analysis software. Descriptive statistics comprising frequencies and percentages were used to describe variables used in the study. Pearson's Chi-square test was used to establish the significance

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between the categorical variables whereas correlation enabled the ascertaining of the association between various variables. Statistical significance of the relationship between variables was inferred at 5% level of significance. Ethical review and clearance from relevant ethical review bodies and government agencies was obtained. Participation was on voluntary basis; confidentiality was assured for all participants.

Results

Figure 1 shows the overall level of disease classification systems utilization in the study area. The overall utilization was computed based on the four main dimensions of ICD utilization: Planning, Reimbursement, Reporting and Decision making. The responses for these aspects were summed and divided by four so as to come up with a composite measure of the level of utilization.

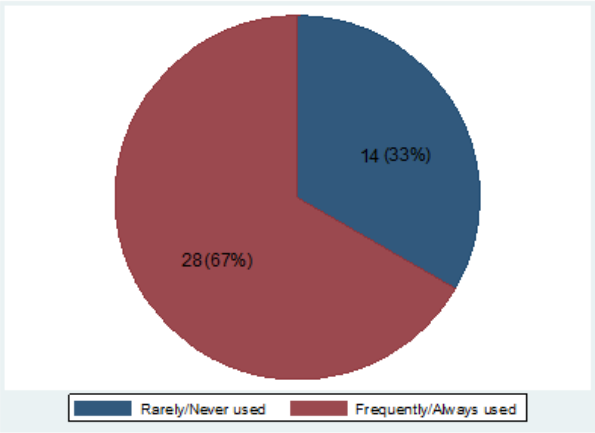

Figure 1: Overall ICD utilization

Out of the 42 respondents, 28 (67%) indicated that the systems were utilized either frequently or always on average for the functions studied.

Table 1 shows a cross-tabulation of overall ICD-10 utilization and various personnel factors.

Table 1: Cross tabulation of ICD-10 utilization and various factors

Variables	Value labels	Frequency of Use (Percentage)		
		Rare / Never (N=14)	Frequent / Always (N=28)	Total (n=42)
Age (yrs)	**<30**	8(57%)	9(32%)	**17(40%)**
	30+	6(43%)	19(68%)	**25(60%)**
Sex	**Male**	4(29%)	13(46%)	**17(40%)**
	Female	10(71%)	15(54%)	**25(60%)**
Highest Education	**Cert.**	3(21%)	5(18%)	**8(19%)**
	Dip	6(43%)	14(50%)	**20(48%)**
	Above Dip	5(36%)	9(32%)	**14(33%)**
Overall Experience	**<5 years**	10(71%)	16(57%)	**26(62%)**
	5+ years	4(29%)	12(43%)	**16(38%)**
Coding experience	**<1 year**	4(29%)	10(36%)	**14(33%)**
	1-5 years	8(57%)	11(39%)	**19(46%)**

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	>5 years	2(14%)	7(25%)	**9(21%)**
ICD Knowledge	**Poor**	3(21%)	10(36%)	**13(31%)**
	Good	11(79%)	18(74%)	**29(69%)**
ICD Perception	**Poor**	5(36%)	3(11%)	**8(19%)**
	Good	9(64%)	25(89%)	**34(81%)**

Majority of the study participants, (59%)had 30+ years. An equal proportion of respondents (59%) comprised female health professionals. Twenty-nine (69%) of the study participants had good knowledge whereas 34 (81%) had good perception of ICD.

Table 2: Pearson chi-square results for the cross-tabulation of the dependent variables and overall ICD utilization

	Frequency of Use, *n*			
Variables	**Rare / Never (N=14)**	**Frequent / Always (N=28)**	**Total (n=42)**	**Chi-square (p-value)**
Age				
<30 years	8	9	**17**	**2.421 (0.120)**
30+ years	6	19	**25**	
Sex				
Male	4	13	**17**	**1.235 (0.266)**
Female	10	15	**25**	
Highest Education				
Certificate	3	5	**8**	
Diploma	6	14	**20**	**0.198 (0.906)**
Undergrad	5	9	**14**	
Overall Experience				
<5 years	10	16	**26**	**0.808 (0.369)**
5+ years	4	12	**16**	
Coding experience				
<1 year	4	10	**14**	
1-5 years	8	11	**19**	**1.301 (0.522)**
>5 years	2	7	**9**	
ICD Knowledge				
Poor	3	10	13	**0.891 (0.345)**
Good	11	18	29	
ICD Perception				
Poor	5	3	8	**3.783 (0.052)**
Good	9	25	34	
Total	**14**	**28**	**42**	

ICD perception was the only personnel factor significantly associated with overall ICD-10 utilization in the hospitals. Age, sex, highest educational qualification, overall work experience period, ICD-related work experience period, and ICD knowledge were all not statistically significantly associated with ICD utilization in the participant hospitals.

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For the ICD perception variable, the odds ratio was calculated as well as the associated p-value. Table 3 presents the findings.

ICD Perception	Rarely / Never (N=14)	Frequent / Always (N=28)	Total (n=42)	Proportion frequently	Odds Ratio (p-value)
Good	9	25	34	**73%**	**4.63 (0.049)**
Poor	5	3	8	**37%**	
Total	14	28	42	**67%**	

The participants from facilities that reported good perception towards ICD were 5 times likelier to frequently/always use the coding systems than those that reported poor perception.

4. Discussions

Age, sex, highest educational qualification, overall work experience period, ICD-related work , and experience period were all not statistically significantly associated with ICD utilization in the participant hospitals. This observation was inconsistent with Quan et al. who defined knowledge as a "fluid mix of framed experience, values, contextual information, and expert insight that provides a framework for evaluating and incorporating new experiences and information". Based on this definition, they argued that knowledge influenced ICD adoption [5].

The study also found out that ICD knowledge was not statistically significantly associated with proper or frequent ICD usage. This finding was inconsistent observations by Chen et al. who claimed that proper disease classification by the coders depended on their knowledge of the anatomical features of the human body, each of which has a particular name whose code is also unique [15]. The knowledge of the anatomy of the human body is therefore a critical aspect in disease classification. The study also observed that good ICD knowledge translated in less utilization of the systems within the participant facilities. This is in line with the common practice in which many professionals code the diseases off head without reference to ICD manuals. Consequently, this issue becomes detrimental to the usage or implementation of ICD at the facilities given that some of the facilities overlooked the need for an ICD system [16]. A classic example was in a facility that only coded spontaneous vertex delivery (SVD) given that that was the only procedure done at the facility. In that facility, the clinical coding was done without the ICD manuals since the code for SVD was known by all HRIOs as "Z37.0". This is consistent with reports by Chen et al. who claimed that certain conditions, procedures, or parts of the body such as the brain and the heart are easily known by virtually anyone, health professional or not [15]. However, there are certain terminologies that are less intuitive, and therefore require a certain level of knowledge on the terminology, such as myocardium [16].

ICD perception was the only personnel factor significantly associated with overall ICD-10 utilization in the hospitals. For every unit increase in perception towards ICD there is a 5-times likelihood of frequently or always using the coding systems than those that reported poor perception. This finding is consistent with Hohl et al. who claimed that ICD perception strengthening translated in better utilization [1]. According to Heron, improving perception through the identification of common coding errors, implementation education and systems changes led to significantly improved coding utilization [18].

5. Conclusion

Staff perception of ICD systems is an important determinant of its utilization. Providing tailored capacity building and sensitization of ICD system benefits and value-add to staff can significantly counter negative perceptions and improve utilization in hospitals.

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Conflict of Interest

Authors declare no conflict of interest in this study

Authors Contribution

Duncan Mutongu conceptualised, designed, collected data, analysed, drafted and approved this manuscript. George Otieno and Kenneth Rucha provided technical guidance in the conceptualisation, drafting, analysis, drafting, review and approval of the manuscript. Gilbert Rithaa & Abel Khisa provided technical support in the conceptualisation, analysis, drafting and review of the manuscript. All the authors reviewed and approved the manuscript for publication.

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