

Technological Factors Influencing Utilization of Disease Classification Systems in Public Hospitals in Kiambu County, Kenya

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Abstract: *The objective of this research is to examine the technological factors influencing the adoption of international disease classification systems in public health hospitals within Kiambu County. The study was carried out in Kiambu County, Kenya, focusing on public hospitals. A cross-sectional descriptive study design was employed, targeting healthcare providers as the primary population. The sample was selected through a combination of purposive sampling and complete census methods, encompassing all 119 Health Records and Information Officers in public hospitals across Kiambu County. Data collection utilized self-administered questionnaires and key informant interviews, facilitated by two research assistants. Data entry and analysis were conducted using SPSS version 22, incorporating both descriptive (frequencies, means, percentages) and inferential statistics (Pearson chi-square with degrees of freedom), with a significance level set at 5%. Out of the 119 targeted respondents, 112 participated, resulting in a response rate of 94%. To address non-response bias, an attrition rate of 10% was applied to achieve balanced results. The findings revealed that the majority (72%) of the surveyed health facilities employed manual systems, with less than one computer per staff in 86% of the facilities. This distribution is typical in government-managed or public health facility settings. Clinical coding practices varied across facilities based on their respective layouts. The study identified inadequate technological infrastructure, including software and technology management policies, as obstacles to the effective utilization of disease classification systems (DCS). Statistical analysis provided sufficient evidence to reject the null hypothesis, indicating a significant association between technological factors and DCS utilization. The research highlights the limited adoption of technology and the scarcity of IT resources in the implementation of DCSs. Based on the findings, the study proposes several recommendations: 1) The County Health Management Team (CHMT) and Sub-CHMT should encourage the multifaceted utilization of DCSs at the facility level to enhance staff perception. 2) Health Records and Information Officers (HRIOs) should emphasize the importance of DCS technology in health facilities to promote its utilization. 3) The Ministry of Health (MOH) should allocate additional resources for health, including DCS, at both national and county levels to enhance adoption and implementation.*

Keywords: Disease classification systems, technology adoption, public health hospitals, Kiambu County Kenya, health information management

1. Introduction

The clinical coding of data holds immense potential across various sectors, from research to healthcare management and insurance. However, its actual utilization depends greatly on the user's knowledge and adherence to established standards [1]. The evolution of the International Classification of Diseases (ICD) reflects the dynamic nature of disease coding standards. The World Health Organization (WHO) Collaborating Centers for the Classification of Diseases extensively revised ICD-10 before its publication in 1990, expanding its scope to include over 155,000 codes, a significant increase from ICD-9's approximately 17,000 codes [2]. This expansion aimed to accommodate a wider range of diagnoses and improve international adoption.

In the United States, the National Center for Health Statistics (NCHS) oversees the adaptation of ICD to suit American healthcare requirements. The development of the International Classification of Diseases, Tenth Revision, Clinical Modification (ICD-CM) involved a meticulous process, including public feedback and field testing by organizations like the American Hospital Association and the American Health Information Management Association (AHIMA) [3]. The resulting ICD-CM represents a significant enhancement over its predecessors, offering diagnosis/symptom combinations to streamline coding, additional information pertinent to managed care and ambulatory settings, and increased code specificity [4]

2. Methods

Study Design

A cross-sectional descriptive design was employed, integrating both quantitative and qualitative methods. Kiambu County boasts 14 level 4 health facilities or higher, including 3 level 5 hospitals and 11 level 4 hospitals. The study population consisted of 2,700 government employees working in these hospitals. A census sampling approach was utilized to include all 46 Health Records and Information Officers (HRIOs) from level 4 and 5 hospitals in Kiambu County for the self-administered questionnaires. Data entry and cleaning were performed using SPSS Version 22. Prior to analysis, pre-analysis checks were conducted to identify and rectify inconsistencies, incorrect, and missing data.

Quantitative data were analyzed using SPSS Version 22, while qualitative data were analyzed through content reviews and grounded theories. Descriptive statistics, including frequencies and percentages, were used to summarize the variables under study. Pearson's Chi-square test was employed to assess the significance between categorical variables, and correlation analysis was utilized to examine the association between various nominal variables. Statistical significance was inferred at a p-value of 5%. Ethical clearance was obtained from relevant ethical review bodies and government agencies, and participation in the study was voluntary, with confidentiality assured for all participants.

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3. Outcomes

Table 1: Socio-demographic characteristics of respondents

Variables	Value labels	Frequency	Percentage
Age	<30 years	46	41%
	30+ years	66	59%
	Total	112	100%
Sex	Male	35	31%
	Female	77	69%
	Total	112	100%
Highest Education	Certificate	22	19%
	Diploma	54	48%
	Undergraduate	36	32%
	Total	112	100%

The socio-demographics studied were Age, Sex, and highest level of education. The majority (59%) of the participants were at least 30 years' old, whereas 69% (n=77) were female. For the highest education, most (48%) respondents had attained diploma level compared to those with certificates or undergraduate levels who comprised 22% and 32% respectively.

Table 2: Influence of participant sociodemographic characteristics on DCS utilization

Variables	Value labels	Individual-level DCS Utilization status						Chi-square (d.f.); p-value
		Limited use		Extensive use		Total		
		N	%	N	%	n	%	
Age	<30 years	22	59%	24	32%	46	41%	3.421 (1); 0.020
	30+ years	15	41%	51	68%	66	59%	
Sex	Male	8	22%	27	36%	35	31%	2.53 (1); 0.076
	Female	29	78%	48	64%	77	69%	
Highest Education	Certificate	8	22%	14	18%	22	20%	0.231 (2); 0.906
	Diploma	16	43%	38	51%	54	48%	
	Undergraduate	13	35%	23	31%	36	32%	
Overall DCS Utilization status		37	33%	75	67%	112	100%	

The analysis revealed that only age showed a significant association with the overall utilization of DCS in the hospitals.

Table 4.1: Results of test of association between technological factors with the Facility level of utilization

Variable	Value labels	Facility-level Utilization status			Fisher's test
		Utilized	Not utilized	Total	
Disease classification references available	<2	4 (40%)	1 (25%)	5 (36%)	p=0.671
	2 or more	6 (60%)	3 (75%)	9 (64%)	
Type of disease classification system present	Manual	7 (70%)	3 (75%)	10 (72%)	p=0.899
	Electronic	3 (30%)	1 (25%)	4 (28%)	
Computer: HRIO ratio	< 1:1	8 (80%)	4 (100%)	12 (86%)	-
	≥ 1:1	2 (20%)	0 (0%)	2 (14%)	
Overall DCS Utilization status		10 (71%)	4 (29%)	14 (100%)	

Most, 10 (72%) of the health facilities surveyed used manual systems whereas 12 (86%) had less than one computer per staff. Given it is within the government-moderated or public health facility setup, it may be unrealistic to expect even a 1:1 ratio. Nine (64%) of the facilities observed had 2 or more ICD references. Given that 6 facilities had earlier been reported not to be using ICD, the implication of this finding is that there is one facility with at least 2 references.

4. Discussion

The study findings indicated that clinical coding practices varied across hospitals, depending largely on the infrastructure and systems in place. Some hospitals integrated coding into the patient registration or clerking process, while others had systems allowing clinicians to conduct coding alongside patient care using digital platforms, particularly in well-established facilities with electronic medical record (EMR) capabilities. However, the majority of respondents noted that clinical coding primarily occurred in the records

offices upon patient discharge. Interestingly, regardless of the location or personnel responsible for coding, respondents generally favored maintaining the existing process.

These findings align with previous research by [4] which highlighted significant improvements in clinical modifications over earlier versions of the International Classification of Diseases (ICD). These enhancements include the creation of diagnosis/symptom combinations to streamline code usage, additional information pertinent to managed care and ambulatory encounters, and greater code specificity.

The National Center for Health Statistics (NCHS) conducts annual updates of the ICD-CM, with the latest release in December 2012. Regarding budget-related concerns, respondents expressed dissatisfaction with resource allocation for health, citing limitations due to broader resource constraints. Some respondents indicated that these challenges were part of a larger national issue, suggesting that

local interventions within the county might not suffice to address them.

Regarding policy matters, the study revealed the presence of international coding guidelines and policies facilitated by the World Health Organization (WHO), although local or national guidelines were reportedly lacking. Given the global recognition of the ICD, modifications to the codes might not adequately address the objective of achieving a universally acceptable standard for sharing and utilization of health data.

5. Conclusion

Technological factors not associated with DCS utilization. There is limited adoption of technology and availability of IT resources in use of DCSs.

References

- [1] Allanson, E.R., et al. (2016) The WHO Application of ICD-10 to Deaths during the Perinatal Period (ICD-PM): Results from Pilot Database Testing in South Africa and United Kingdom. *BJOG*, 123, 2019-2028.
- [2] R. Caskey,(2016) J. Zaman, H. Nam, S. R. Chae, L. Williams, G. Mathew, . . . and A. D. Boyd, 2014The Transition to ICD-10-CM: Challenges for Pediatric Practice”, *Pediatrics*, 134(1), p. 4. Reprinted with permission.
- [3] Harris, S. T., & Zeng, X. (2012). How to set up an international classification of diseases, 10th revision training workshop: Case study. *The Healthcare Manager*, 31(4). doi:10.1097/HCM.0b013e31826fe2e4
- [4] Topaz, M., Shafran-Topaz, L., & Bowles, K. H. (2013). ICD-9 to ICD-10: Evolution, revolution, and current debates in the United States. *Perspectives in Health Information Management*, 10,