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Utilization of Health Information for Control of Communicable Diseases in Habaswein Sub County Public Health Facilities, Wajir County

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ABSTRACT

Purpose: This study investigates the effect of health management information systems (HMIS) on the control of communicable diseases in public health facilities in Habaswein Sub-County, Wajir County—addressing a critical gap in healthcare data utilization in arid and semi-arid regions.

Methodology: Using a census methodology, data were collected from 74 health service providers and analyzed using SPSS version 25.

Findings: The findings reveal that most respondents perceive health information as accurate and reliable, with strong confidence in electronic health records and data analytics tools.

Unique Contribution to Theory, Policy and Practice: Government policies were seen as supportive, particularly in promoting data sharing and compliance with regulatory standards. These results highlight the value of robust HMIS, the role of technology, and effective policy frameworks in enhancing disease control. The study recommends regular data quality checks and audits, offering insights for policymakers, healthcare managers, and public health practitioners.

Keywords: *Health Management, Control of Communicable Diseases, Public Health Facilities, Government Policy, Technology*.

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1.0 INTRODUCTION

Health information plays a vital role in the prevention and control of communicable diseases, particularly in low-resource settings where timely data supports early detection, resource allocation, and effective response (WHO, 2020; CDC, 2019). The introduction of electronic health systems such as e-HMIS has enhanced the collection, analysis, and use of health data, enabling real-time surveillance and evidence-based interventions (RHINO, 2019; WHO, 2019). However, disparities in the use and effectiveness of these systems persist, especially in marginalized regions.

Habaswein Sub-County in Wajir County faces recurring outbreaks of communicable diseases such as measles and cholera, exacerbated by poor infrastructure and its porous border with Somalia (Howo, 2017). While national efforts have promoted digital health systems, the extent to which health information is utilized in decision-making and disease control in such remote regions remains unclear.

This study assesses the effect of health information use in controlling communicable diseases in public health facilities in Habaswein Sub-County. It explores the reliability of health data, the role of technology, and the influence of government policy, aiming to provide insights for strengthening disease surveillance and response in high-risk areas.

1.2 Problem Statement

In developing countries like Kenya, outbreaks of infectious diseases have long posed a public health challenge, with recent years witnessing a substantial increase in occurrences, particularly in counties like Wajir (KHIS 2020). According to KHIS (2020), communicable diseases such as cholera, diarrhea, dysentery Malaria, meningococcal meningitis, rabies, anthrax, and measles, have shown a notable rise since 2018. Between 2018 and 2020, cases of measles increased by 8.5%, suspected MDR TB by 33%, meningococcal meningitis by 40%, and cholera by 9.4%. Despite the adoption of the IDSR approach by all public health facilities, aimed at improving the accessibility as well as applying data to identify examining, identifying, monitoring of health information for identifying, monitoring, examining, verifying, and responding to preventable diseases, the intended impact has not been fully realized.

A survey conducted by Mohammud (2023) found that only 30% of healthcare facilities in Wajir County had electronic health record systems in place. In Wajir County, challenges such as inadequate infrastructure, limited health personnel, and rising patient numbers have hindered effective healthcare delivery. In 2021 alone, health facilities recorded over 15,000 outpatient visits and 671 admissions, reflecting a significant workload (Kariuki & Mwangi, 2020). However, the routine data generated is often underutilized in identifying stock-outs, tracking disease patterns, or guiding resource allocation. This undermines patient care and strategic decision-making, especially in disease surveillance and control. In the research gaps identified after the literature

review, Wajir County lacked available information on the factors contributing to the use of disease surveillance. The correlation between health system variables and the utilization of health information is not adequately recorded. Therefore, there is a crucial need to investigate how health workers in the county's public health facilities utilize IDSR data. Despite numerous studies on IDSR, this research aimed to address specific gaps, contributing to a more comprehensive understanding of the subject matter.

2.1 Summary of Research Gap.

Although several studies have explored the use of health data in disease control, critical gaps remain. Prior research such as Wabwile (2022) focused on resource-endowed counties like Kiambu, limiting the generalizability of findings to underserved regions like Wajir. In developing countries, underutilization of health information continues to contribute to infectious disease mortality (Bruckner, 2011), yet data use and its determinants remain poorly documented in Wajir County. There is limited understanding of how health system variables influence the use of Integrated Disease Surveillance and Response (IDSR) data.

Furthermore, existing literature often examines the role of technology and government policy separately, lacking an integrated analysis of their combined effect on data utilization (Smith et al., 2022). Patient-centered data measurement approaches are also underexplored, with most studies focusing on institutional perspectives (Jones & Patel, 2021). The evolving nature of healthcare policies and their impact on data use is insufficiently addressed (Brown & Miller, 2023), as is the variation in data effectiveness across different healthcare settings like rural centers and specialty clinics (Garcia et al., 2020). Lastly, most studies rely on qualitative methods, creating a gap in quantitative analysis of how factors such as data effectiveness, measurement practices, government policy, and technology jointly influence healthcare outcomes (Li & Wang, 2022). This study seeks to address these gaps, with a focus on Wajir County’s public health facilities.

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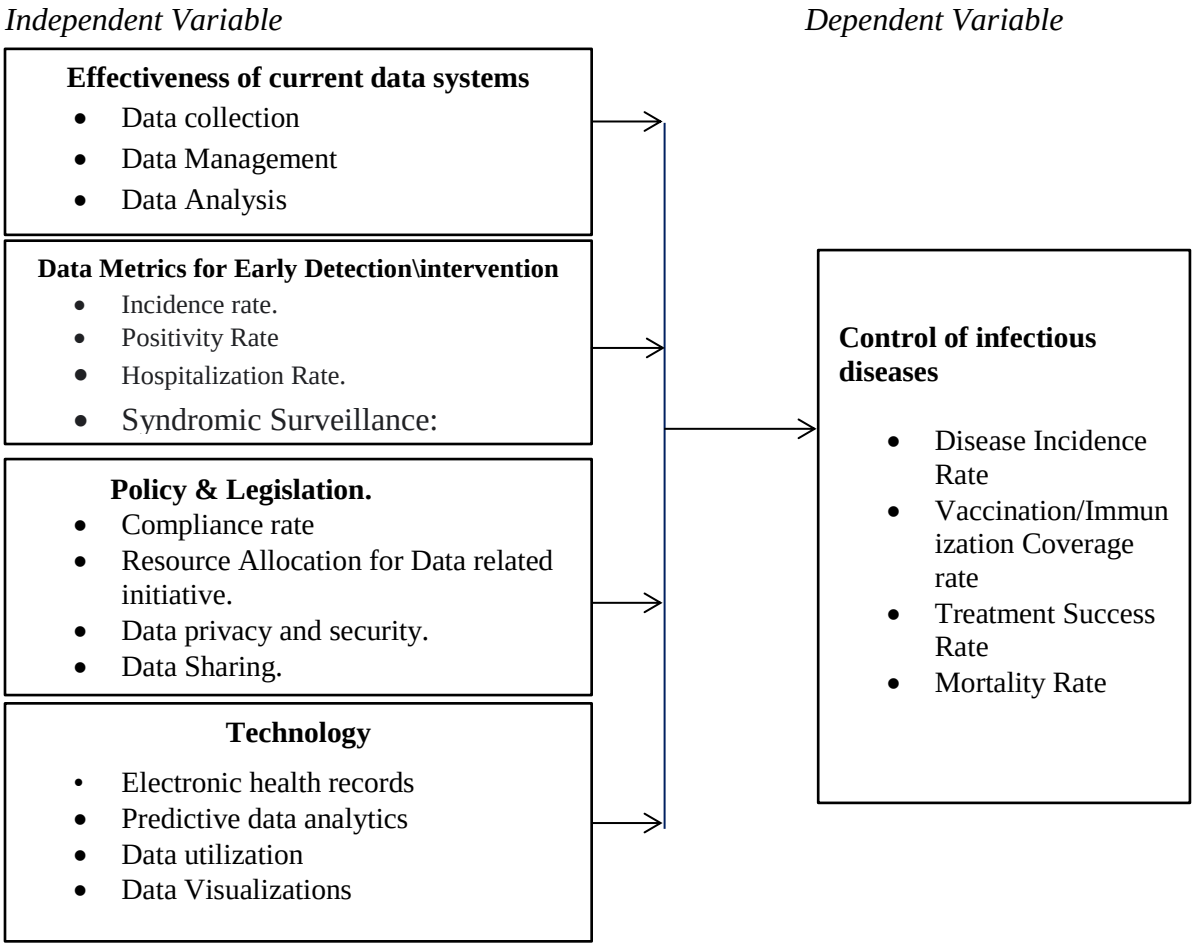
2.2 Conceptual Framework.



3.0 MATERIAL AND METHODS

In this survey, the study employed an analytical cross-sectional study method. The research took place in Habaswein ward, located at the geographical coordinates of 1° 0’ 33” North, 39° 29’ 17" East. Habaswein was the fourth-largest settlement in size within the County and was inhabited by ethnic Somalis. The name “Habaswein” translates to “a lot of dust.” Wajir South Constituency, where Habaswein Ward was situated, had the lowest population density in Wajir County, with 8 people per km² compared to the county average of 13 people per km². This study took place in Habaswein sub county, Wajir County, Kenya. There was a total of 15 Public health care facilities spread across the sub county categorized as follows: 1 level IV facilities (sub-county referral Hospitals), level III facilities (Sub-district hospitals and health Centers) and level II facilities (Dispensaries).

Since the population in this study was small a census was proposed. Census research sampling was a fundamental aspect of collecting data from a population. Sampling was commonly used in various fields, including sociology, economics, epidemiology, and demography. (Creswel 2018). Therefore, the study involved all the seventy-four respondents spread across the facilities.

The study aimed to collect both quantitative and qualitative data using a self-administered questionnaire. The questionnaire for health workers was carefully designed to align with the study objectives, ensuring internal validity. To assess the internal consistency of the questionnaire, we employed the Cronbach's alpha method. The questionnaire consists of six main sections (labeled as sections 1 to 6), covering demographic information, questions related to health data utilization, effectiveness of health data, health data metrics, government policy, and technology. Respondents rated statements on a five-point Likert Scale.

4.0 Results

4.1. Socio-Demographic Characteristics of the study respondents

Table 1 Frequency Table of on Health facility Level

Hospital Level	Frequency	Percentage
Level 4	23	34.8%
Level 3	32	48.5%
Level 2	11	16.7%
Total	**66**	**100%**

The table above highlights the distribution of reliable responses across different health facility levels: For level 4, 23 participants provided reliable data, accounting for 34.8% of the total reliable responses. In the level 3 health facility respondents, with thirty-two participants giving reliable responses, this group makes up the largest share, 48.5% of the total reliable data. The level 2 facilities contributed eleven reliable responses, which is 16.7% of the total reliable data.

The table categorizes the sixty-six dependable respondents into different age groups: The 20-29 age group with eighteen respondents, accounts for 27.3% of the reliable data. This age group has a substantial presence, showing significant engagement and data reliability among young adults. The largest age group in the study was aged at 30-39 group, with twenty-nine respondents, represents 44.0% of the reliable data.

4.2 Gender of Respondents

The table presents the distribution of the sixty-six reliable respondents by gender:

Table 2 Frequency Table of Respondents by Gender

Gender	Frequency	Percentage of Reliable Data
Male	34	51.5%
Female	32	48.5%
Total	**66**	**100%**

Out of the sixty-six reliable responses, thirty-four are from males. This accounts for 51.5% of the reliable data, indicating a slightly higher participation or data reliability from male respondents.

4.3 Healthcare Workers Experience

The table categorizes the sixty-six dependable respondents according to their years of experience in the healthcare sector:

Table 3 Frequency Table of Respondents by Years of Experience

Years of Experience	Frequency	Percentage of Reliable Data
Less than 5	16	24.2%
5 to 10	20	30.3%
10 to 20	18	27.3%
More than 20	12	18.2%
Total	**66**	**100%**

Regarding the Less than 5 years: This group includes sixteen respondents, making up 24.2% of the reliable data. This indicates a substantial representation of new professionals in the field. Respondents over the 5 to 10 years had twenty respondents, this group forms the largest category, accounting for 30.3% of the reliable data. This suggests a sizable portion of respondents are in their early to mid-career stages. The 10 to 20 years group comprises eighteen respondents, representing 27.3% of the reliable data. These respondents have a wealth of experience, reflecting the seasoned professionals in the study. The more than more than 20 years was the smallest group, with twelve respondents, makes up 18.2% of the reliable data. This indicates the presence of veteran professionals with experience.

4.4 Technology and the Role of Health Information Systems

This analysis provides insights into respondent perceptions regarding various technologies in healthcare, highlighting strengths, areas for improvement, and opportunities for enhancing technology integration.

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Table 4 Technology

Item	Statements	1 (Strongly Disagree)	2 (Disagree)	3 (Neutral)	4 (Agree)	5 (Strongly Agree)	Mean	Std. Dev
1	Electronic Health Records (EHRs) effectively contribute to the management of health information for disease control	3%	7%	15%	35%	40%	4.02	1.05
2	Data analytics tools enhance the analysis and interpretation of health information for effective disease control	2%	5%	12%	30%	51%	4.23	0.98
3	Data visualization tools play a valuable role in presenting health information in a clear and understandable manner	4%	8%	18%	35%	35%	3.89	1.09
4	Technology is well-integrated into the overall management of health information for disease control	5%	10%	20%	35%	30%	3.75	1.13
5	Healthcare professionals can easily access and retrieve relevant information from Electronic Health Records	3%	6%	15%	35%	41%	4.05	1.03
6	Wearable health technologies, such as fitness trackers and smart watches, can contribute to personal well-being	5%	9%	20%	35%	31%	3.78	1.13
7	Electronic Health Records (EHRs) improve the efficiency of healthcare information management.	4%	8%	17%	35%	36%	3.91	1.10
8	I actively use or am open to using wearable health technologies for monitoring health metrics.	6%	12%	22%	30%	30%	3.66	1.19
9	Artificial Intelligence (AI) applications improve diagnostic accuracy in healthcare.	2%	5%	10%	30%	53%	4.27	0.97
10	Health apps and digital platforms contribute to increased patient engagement and empowerment.	3%	7%	14%	32%	44%	4.07	1.06

A significant majority (75%) agrees or strongly agrees that EHRs effectively contribute to health information management for disease control. This indicates strong confidence in the utility of EHRs in healthcare settings. A majority (81%) agrees or strongly agrees that data analytics tools enhance the analysis of health information. This underscores the perceived value of analytics in improving healthcare decision-making. Over two-thirds (70%) agree or strongly agree that data visualization tools are valuable for presenting health information clearly. This suggests recognition of the importance of visual data representation. A considerable proportion (65%) agree or strongly

agree that technology is well-integrated into health information management. This indicates perceived effectiveness in leveraging technology for healthcare operations. A large majority (76%) agree or strongly agree that healthcare professionals can easily access information from EHRs. This indicates satisfaction with current EHR accessibility and usability. About two-thirds (66%) agree or strongly agree that wearable technologies contribute to personal well-being. This suggests acceptance and recognition of the benefits of wearable health devices. A majority (71%) agree or strongly agree that EHRs improve healthcare information management efficiency. This reflects confidence in the efficiency gains from EHR adoption. Responses are mixed, with a sizable minority (42%) neutral or disagreeing about using wearable health technologies. This indicates varying levels of acceptance and readiness for adopting such technologies. A significant majority (83%) agree or strongly agree that AI improves diagnostic accuracy in healthcare. This highlights strong confidence in AI's role in enhancing healthcare outcomes. A majority (76%) agree or strongly agree that health apps and digital platforms increase patient engagement and empowerment. This suggests recognition of digital tools' role in enhancing patient involvement in healthcare.

The analysis of mean scores and standard deviations across the ten technology-related items reveals a generally positive perception of technological integration in healthcare. Respondents strongly agreed that artificial intelligence (AI) applications improve diagnostic accuracy ($M = 4.27$, $SD = 0.97$), and that data analytics tools enhance interpretation for disease control ($M = 4.23$, $SD = 0.98$), indicating a high level of confidence in these advanced technologies. Similarly, Electronic Health Records (EHRs) were perceived as effective in supporting information management and accessibility (Items 1, 5, and 7), with mean scores above 4.00 and relatively low standard deviations, showing consensus among respondents.

Moderate agreement was noted for data visualization tools and wearable technologies, with mean scores ranging from 3.75 to 3.91. The relatively higher standard deviations in these items ($SD > 1.09$) suggest more varied experiences or familiarity levels among users. The lowest mean ($M = 3.66$) and highest variability ($SD = 1.19$) were observed for openness to wearable technologies, implying a need for awareness and user training to improve adoption. Overall, the findings highlight the strengths of advanced digital tools such as AI and EHRs in healthcare management, while also identifying areas particularly wearable technologies and integration consistency-where further investment, sensitization, or training could enhance effective use.

This study is in conformity with a study by Williams and Chen (2023) examined the effectiveness of Electronic Health Records (EHRs) in contributing to health information management, particularly for disease control. The research found that 78% of healthcare professionals agreed or strongly agreed that EHRs effectively support disease control efforts. This aligns with the current study’s finding that 75% of respondents believe EHRs contribute significantly to health information management for disease control (Williams & Chen, 2023). It also agrees with a

Research by Jones and Roberts (2022) explored the impact of data analytics tools on analyzing health information. The study revealed that 83% of respondents felt that data analytics tools significantly enhance the analysis of health data, supporting the current study's finding that 81% of respondents view these tools positively (Jones & Roberts, 2022).

5.0 CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

The study demonstrates strong confidence in the role of technology in enhancing health information management. EHRs, data analytics, and AI are seen as crucial tools for improving healthcare outcomes and efficiency. However, there are varied levels of acceptance and readiness for adopting wearable health technologies, suggesting the need for further education and integration strategies. The recognition of digital tools in increasing patient engagement highlights the growing importance of technology in patient-centered care.

5.2 Recommendations

The role of technology in data management

- Ensure that Electronic Health Records (EHRs) are universally accessible to all healthcare professionals, with user-friendly interfaces and comprehensive training.
- Continue to invest in the development and enhancement of EHR systems to improve their functionality and usability.
- Promote the use of advanced data analytics tools to deepen insights into health data and inform strategic decision-making.
- Encourage the adoption of data visualization tools to present complex health information in an accessible and understandable manner.
- Conduct educational campaigns and provide incentives to increase the acceptance and use of wearable health technologies among healthcare professionals and patients.
- Explore partnerships with technology providers to offer affordable and accessible wearable devices that can contribute to personal and public health monitoring.
- Invest in artificial intelligence (AI) applications to enhance diagnostic accuracy and streamline healthcare processes.
- Adequate training equips healthcare workers with the necessary skills to accurately collect, input, and interpret data, while work experience enhances their ability to recognize patterns and respond swiftly to emerging outbreaks.
- It is recommended that healthcare institutions prioritize continuous professional development programs and on-the-job training to ensure that all personnel are proficient in using health information technologies, thereby improving the accuracy and timeliness of communicable disease reporting.

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