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Individual characteristics associated with the use of scorecard to improve RMNCAH performance indicators in public primary health facilities in Kenya

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Abstract

Purpose: In order to improve RMNCAH (reproductive, maternal, newborn, child, and adolescent health) in Kenyan public primary health facilities, the study assessed the individual characteristics of the healthcare workers using scorecards in Kwale and Kilifi counties.

Materials and Methods: We selected a stratified random sample of healthcare workers (HCWs) from all public primary care health facilities in Kwale and Kilifi counties for a cross-sectional study. We collected quantitative data using a semi-structured questionnaire using kobo collect tool.

Findings: The findings revealed that 62.5% of male healthcare workers used scorecards to measure RMNCAH performance, compared to 37.5% of female healthcare workers. Among married healthcare professionals, 68.8% used scorecards, compared to 25.0% of single and 6.3% of divorced or separated personnel. Only 6.3% of HCWs aged 20-29 years used scorecards, in contrast to 68.8% of those aged 30-39 years and 18.8% of those aged 40-49 years. Additionally, 62.5% of nurses used scorecards, compared to 37.5% of registered clinical officers (RCOs). A significant majority (75.0%) of healthcare professionals with a diploma used scorecards, compared to those with other educational levels. Less experienced HCWs (0-4 years and 5-9 years) were more likely to use scorecards than those with 10–14 years and 15 years or more of experience. The relationship between years of experience and scorecard use was statistically significant (p= 0.029, <0.05). The study concludes that scorecard use was more prevalent among male healthcare workers, married professionals, and those aged 30–39 years, compared to their female, single, and younger or older counterparts. Less experienced healthcare staff were more likely to use scorecards than those with longer tenures.

Implications to Theory, Practice and Policy: The study recommends that healthcare facilities and policymakers promote scorecard use for RMNCAH performance monitoring, focusing on female healthcare workers, single or divorced professionals, RCOs, and those with higher education levels. It emphasizes developing targeted training programs to meet the specific needs of underrepresented groups and creating supportive environments that provide necessary resources and training for scorecard adoption. Additionally, policies should prioritize gender diversity and age inclusivity in training initiatives to ensure all healthcare workers are equipped with the skills needed for effective scorecard utilization.

Keywords: *RMNCAH, Scorecards, Primary Health Facility, Individual Characteristics, Performance Indicators*

JEL Codes: I10, I11, I12, I13, I18, J13

1.0 INTRODUCTION

Public primary health facilities are increasingly using scorecards as a performance management tool to improve reproductive, maternal, newborn, child, and adolescent health (RMNCAH) measures[1]. Higher-educated healthcare workers in Sub-Saharan Africa have demonstrated better understanding and utilization of performance improvement scorecards[2]. Similarly, a World Health Organization (WHO) review emphasized the importance of enhancing the skills of healthcare workers and facility managers through educational programs and scorecard usage training[3].

A study in India found that the gender composition of the healthcare workforce influenced scorecard adoption and utilization. Teams responsible for developing and implementing scorecards should ensure gender diversity to increase acceptance[4]. The World Health Organization (WHO) also highlights the need to overcome gender barriers to improve scorecard effectiveness. Conversely, [5] found that gender has no significant impact on the phases of initiation, decision-making, and execution when adopting innovation. Additionally, [6] reported that the use of individual scorecards did not significantly correlate with respondents' age or gender and was unaffected by the number of individuals they oversee.

Healthcare personnel with greater seniority and expertise may be more receptive to using scorecards, having observed their benefits over time[7]. In contrast, younger healthcare workers may be more adaptable to new performance management tools, and their perspectives should be considered in the design and implementation of scorecard systems[8].

Public service institutions with experienced managers and administrators are often more enlightened regarding performance improvement. Consequently, a manager's tenure may positively influence transformation[9]. However, [10] found that new managers were more eager to embrace innovation, bringing fresh perspectives, unlike long-serving managers, who were more likely to adhere to established organizational culture. Education level fosters openness to new ideas, playing a crucial role in identifying innovation demands and creating a conducive environment for scorecard implementation[11].

Moreover, [12] studied scorecard use in Portugal, finding that knowledge level and scorecard utilization were strongly associated with individual traits, particularly the educational level of the management and the size of the firm. Again, [13] noted that managers' qualifications positively influenced their understanding and application of scorecards. Consequently, better-educated management personnel are more likely to implement new management practices[14]. However, systemic factors, such as resource availability and training infrastructure, may also explain the observed patterns in scorecard usage. For instance, facilities with robust training programs and sufficient resources may exhibit higher adoption rates.

Research Objectives

This study investigated the individual characteristics associated with the use of scorecards in public primary health facilities in Kenya, focusing on factors such as gender, age, education level, and managerial experience. The key objectives include:

i. To assess the relationship between healthcare workers' education levels and their utilization of scorecards for RMNCAH performance.

ii. To evaluate the impact of gender and age on the adoption of scorecards.
iii. To explore how professional experience influences the effectiveness of scorecard implementation.

Problem Statement

Despite the recognized importance of scorecards in enhancing RMNCAH outcomes, gaps remain in understanding the individual characteristics that influence their use in public primary health facilities. Many healthcare workers may lack the necessary training or awareness of the benefits of scorecards, leading to suboptimal performance in RMNCAH measures. This study intends to fill these gaps by identifying the specific characteristics that facilitate or hinder scorecard utilization. The beneficiaries of this study include healthcare workers, facility managers, policymakers, and ultimately, the communities served by these health facilities.

Theoretical Framework

In public health, Diffusion of Innovation (DOI) theory by Roger has been used to accelerate adoption programs of importance, and those such as RMNCAH programme that aim at changing behaviour of a social system. Success in adoption of public health programs can only be a product of understanding the population targeted and the factors that influence their adoption rate.

2.0 MATERIALS AND METHODS

Study Location

The study was conducted in Kwale and Kilifi counties of Kenya. The population of the study area was 876,529 in Kwale and 1,454,211 in Kilifi. The government (Ministry of Health), non-governmental organizations (NGOs), or faith-based organizations (FBOs) own primarily level 2 (dispensaries) and level 3 (health centers) public primary care health facilities in these counties. According to the Kenya Master Health Facility List (KMHFL) report from February 2022, Kwale had 120 public primary care facilities, while Kilifi had 161.

Study Design and Data Collection Techniques

The study utilized a cross-sectional research design. We employed a semi-structured questionnaire to collect quantitative data from 119 healthcare workers, selected through stratified random sampling from selected public primary health facilities in Kwale and Kilifi counties, Kenya. The research team prepared, tested, and finalized a healthcare worker's tool, which they used for data collection in April and May 2024. The research team trained the data collectors on the administration protocols and the use of the Kobo Collect data collection app on handheld mobile devices.

Sample Size and Sampling and Data Collection Techniques

Stratified random sampling techniques was used to select the study participant from all the public primary care health facilities in all the sub-counties. The public primary care health facilities were selected equivalent to the number of dispensaries and health centers using simple randomly sampling. A total of 119 health workers (either a nurse officer or a clinical officer in-charge) were recruited for the study and all administered the same tool to ensure homogeneity.

Since the study was conceptualized as an interventional, the formula by Stanley *et al*., (1990) was applied for calculation of sample size (n) for comparison between two groups when the endpoint is data that is quantitative

$$\text{Sample size (n)} = \frac{2SD^2 (Z_{\alpha//2} + Z_{\beta})^2}{d^2}$$

Where;

SD is standard deviation from previous studies or pilot study

$Z_{\alpha//2}$ is standard errors from the mean corresponding to 95% confidence interval (1.96)

Z_{β} is power of the test (1.28 for $\beta = 10\%$ and 0.842 for $\beta = 20\%$ from Z table)

d is the effect size = difference between the mean values

Using standard deviation found in recent studies done with similar design as 10 and level of significance as 5% and the power of study at 80% with effect size of 5.5. Hence sample size was calculated as follows:

$$\text{Sample size (n)} = \frac{2SD^2 (1.96 + 0.842)^2}{d^2}$$

$$(n) = \frac{2 \times 10^2 (1.96 + 0.842)^2}{(5.5)^2} = 52$$

To accounting for a likely non-response rate of 10% informed by past studies, the effective sample size was adjusted to 57 participants per sub-county.

Inclusion and Exclusion Criteria

Healthcare workers who had been employed for at least six months prior to the survey and were familiar with routine health information generated by the Health Management Information System (HMIS) were eligible to participate. This six-month employment requirement was established to ensure that participants had sufficient exposure to the workplace environment and the HMIS processes. This duration allows healthcare workers to develop a comprehensive understanding of the system, enhancing the reliability of their responses and ensuring that they can provide informed insights based on their experiences. The study excluded participants who declined to give consent.

Data Analysis

The study utilized a quantitative approach to analyze the relationship between healthcare workers' characteristics and the use of scorecards for RMNCAH monitoring. The STATA version 16 a computer software was used for data analysis. A descriptive analysis was performed to summarize the demographic characteristics of the study participants, such as their years of experience and educational levels. The chi-squares and regression analysis was used to determine the relationship between dependent and independent variables. The results generated from the quantitative analysis were presented in tables, figures and textual summaries.

3.0 FINDINGS

In overall, only 16 (13%) of the facilities have ever used a scorecard to monitor RMNCAH performance[15]. This low utilization rate may be attributed to several factors, including insufficient training on scorecard usage, lack of resources, and organizational culture that may not prioritize data-driven decision-making. Qualitative insights from healthcare workers suggest that many feel overwhelmed by existing workloads, which can hinder their ability to engage with scorecards effectively**.** As presented in Table 1, the majority of male healthcare workers (10 or 62.5%) had used a scorecard to monitor RMNCAH performance, compared to 6 (37.5%) of female healthcare workers, with a p-value of 0.516. Regarding marital status and the use of scorecards, 11 (68.8%) were married, 4 (25.0%) were single, and only 1 (6.3%) was divorced or separated and p=0.120. While marital status and gender differences in scorecard use were noted, the lack of statistical significance suggests that these factors may not be as impactful as initially assumed. It is crucial to highlight these findings without overgeneralizing their implications, as systemic factors may overshadow individual characteristics in influencing scorecard adoption.

In terms of healthcare worker cadre, the majority of nurses (10 or 62.5%) had used a scorecard, compared to only 6 (37.5%) of Registered Clinical Officers (RCOs). The Chi-square test shows that the relationship between professional training and scorecard use is marginally statistically significant (p-value = 0.082). Regarding the level of education, the majority of healthcare workers (75.0%) with a diploma used a scorecard, compared to 12.5% with a certificate, 6.3% with a higher diploma, and 6.3% with a degree. However, the Chi-square test indicates that the relationship between educational levels and scorecard use is not statistically significant (p = 0.269).

Table 1: Socio-Demographic Characteristics of the Health Care Workers in Kwale and Kilifi Counties, Kenya

Characteristics	Overall n (%)	Ever Used a Scorecard to Monitor RMNCAH Performance?		P-Value
		Yes (%)	No (%)	
Sex				
Male	59(49.58)	10(62.50)	49(47.57)	0.516
Female	59(49.58)	6(37.50)	53(51.46)	
Intersex	1(0.84)	0(0.00)	1(0.97)	
Marital status				
Single	14(11.76)	4(25.00)	10(9.71)	0.12
Married	102(85.71)	11(68.75)	91(88.35)	
Divorced/Separated	2(1.68)	1(6.25)	1(0.97)	
Widow/Widower	1(0.84)	0(0.00)	1(0.97)	
Professional training/cadre				
Nurse	94(78.99)	10(62.50)	84(81.55)	0.082
RCO	25(21.01)	6(37.50)	19(18.45)	
Educational levels				
Certificate	7(5.88)	2(12.50)	5(4.85)	0.269
Diploma	101(84.87)	12(75.00)	89(86.41)	
Higher diploma	2(1.68)	1(6.25)	1(0.97)	
Degree	9(7.56)	1(6.25)	8(7.77)	

Health Care Workers Age and Scorecard Utilization

According to (Figure 1), the majority (11, or 68.8%) of healthcare workers in the 30-39 age group have used a scorecard. In the 40-49 age group, 3 (18.8%) have used a scorecard, while only 1 (6.3%) of healthcare workers aged 20-29 have done so. Surprisingly, none of the healthcare workers aged 50 to 59 had used a scorecard to track RMNCAH performance indicators

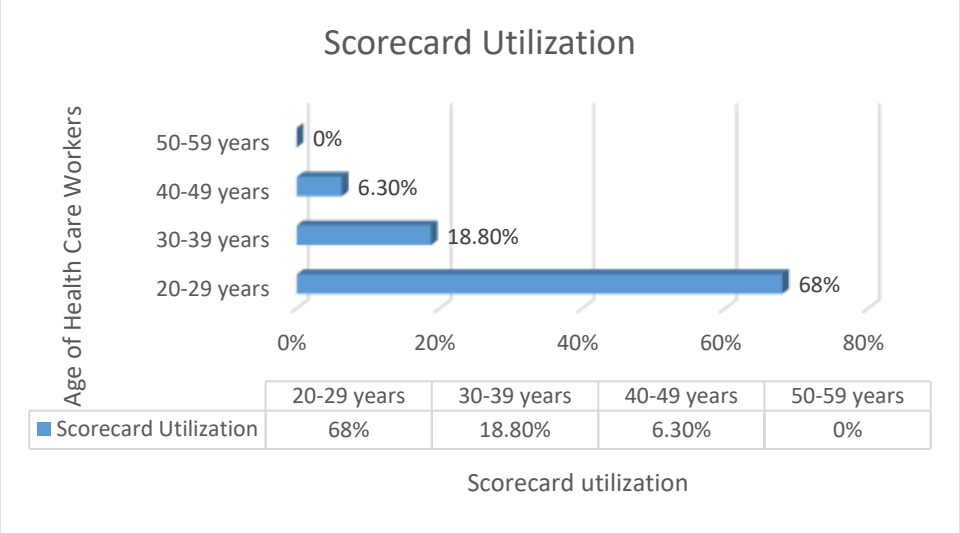

Figure 1: Health Care Workers Age and Scorecard Utilization

Health Care Workers Years of Experience and Scorecard Utilization

According to (Figure 2), the majority of healthcare workers with 5–9 years of experience (6, or 43.8%) and those with 0–4 years of experience (6, or 37.5%) reported using scorecards to monitor RMNCAH performance. In contrast, only 3 (18.8%) of those with 10–14 years of experience reported having done so.

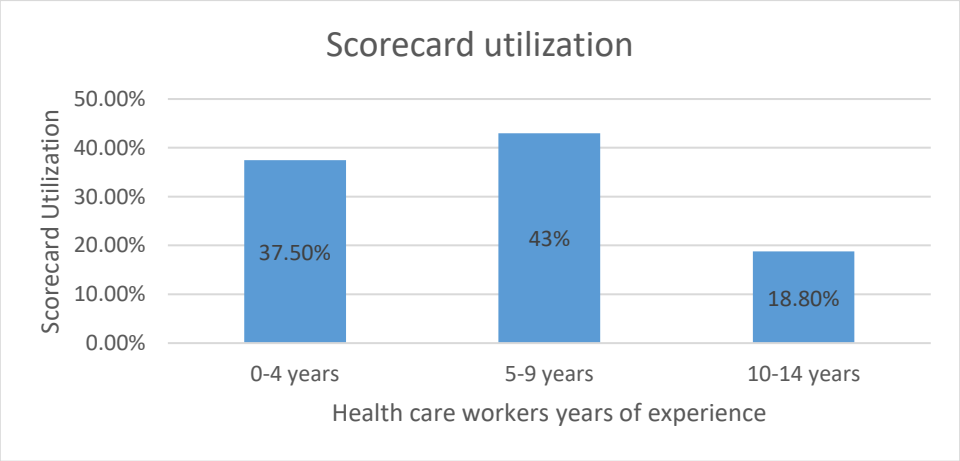

Figure 2: Health Care Workers Years of Experience and Scorecard Use

Table 2: Comparison of RMNCAH Performance Monitoring Scores by Age and Years of Experience

Characteristics	Ever Used Scorecard to Monitor RMNCAH Performance	N	Mean	Min	Max	Std. Dev.	Difference	P Value
Age	Yes	15	34.1	4.2	28	41.2	3.57	**0.0064**
	No	101	37.7	7.5	25.4	56.5		
Years of experience	Yes	16	6.5	3.6	1.9	14.0	3.47	**0.0016**
	No	103	10.0	6.3	0.4	31.0		

For healthcare workers who used a scorecard to monitor RMNCAH performance, the mean age was 34.1 years, with a standard deviation of 4.2 years. The minimum age was 28.0 years, and the maximum was 41.2 years. The p-value of 0.006 indicates that this result is statistically significant. In summary, the regression analysis provided evidence that the age of healthcare workers is a significant predictor of scorecard use to monitor RMNCAH performance.

The mean number of years of experience was 6.5 with a standard deviation of 3.6. The minimum number of years of experience was 1.9, while the maximum was 14.0 years. This result is also statistically significant (p-value = 0.002). Therefore, the years of experience of healthcare workers serve as a statistically significant predictor of their use of scorecards to monitor RMNCAH performance.

Discussions

The study's results highlight how demographic factors influence the use of scorecards to track RMNCAH (reproductive, maternal, newborn, child, and adolescent health) performance in healthcare facilities. According to the study, the majority (68.8%) of healthcare workers aged 30-39 have used a scorecard, compared to only 6.3% of those aged 20-29 and none of those aged 50-59. This indicates that healthcare workers in their prime working years are more likely to utilize scorecards as part of their professional practice. In contrast, younger healthcare workers, who are relatively new to the field, may have less experience or exposure to using scorecards for performance monitoring and evaluation. The results suggest that older, more experienced healthcare workers may be less inclined to adopt or utilize scorecards for performance monitoring compared to their younger counterparts.

Additionally, the results indicate a clear age-related trend in the use of scorecards among healthcare workers. Younger and middle-aged professionals (30-49 years) are more likely to have experience with scorecards, while older workers (50-59 years) appear to be less engaged with this data-driven performance management tool. This could be due to various factors, such as differences in training, exposure to new technologies, and openness to adopting innovative practices. These findings suggest that age-specific interventions or targeted training programs may be necessary to ensure more widespread and equitable use of scorecards across the entire healthcare workforce, regardless of their years of experience. Furthermore, other factors, such as organizational culture, leadership support, and the perceived usefulness of scorecards, may play a more significant role in their adoption and use.

The majority (68.8%) of married healthcare workers had used a scorecard to monitor RMNCAH performance, compared to other marital statuses. However, the p-value of 0.120 revealed that the relationship between marital status and scorecard use was not statistically significant. These results align with[4], who emphasized the need to ensure gender diversity in the teams responsible for developing and implementing scorecards.

Regarding healthcare worker cadre, the majority of nurses (10 or 62.5%) had used a scorecard, compared to only 6 (37.5%) of Registered Clinical Officers (RCOs). The predominance of nurses may reflect the specific healthcare needs and service delivery models in the study areas. This finding suggests that the type of professional training may influence the adoption and use of scorecards. Nurses, who often have a more comprehensive understanding of healthcare processes and outcomes, may be more inclined to utilize scorecards as a tool to monitor and improve RMNCAH performance.

Additionally, the majority (37.5%) of healthcare workers with 0–4 years of experience and 43.8% with 5–9 years of experience were more likely to use scorecards to monitor RMNCAH performance compared to those with more than 10 years. These results align with[10], who found that managers new to their roles were more eager to embrace innovation because they brought a fresh perspective to the job. Long-serving managers, accustomed to the organization's culture, were less likely to implement changes in their practices. Additionally, workload and time constraints may be more of a barrier for experienced workers who have taken on additional responsibilities over time.

In line with the above findings, the study suggests that in order to promote the use of the scorecard in the monitoring and performance of RMNCAH among the underrepresented groups, targeted training should be instituted for the female healthcare worker and those with lower education level etc. Policymakers should focus on culture change by investing in training and assisting diverse service providers with technology. The extension of equal opportunities for all health care workers warrants call for gender and age diversity in training. Further, the development of sustained monitoring and revising approaches would create progress from actual the implementation results, thus leading to good perinatal health among mothers, newborns, and children in future Kenya.

4.0 CONCLUSION AND RECOMMENDATIONS

The study's key findings revealed that male healthcare workers, married professionals, and those in the 30-39 age group were more likely to use scorecards compared to their female, single, and younger or older counterparts. Additionally, nurses and healthcare workers with diploma-level education were more inclined to utilize scorecards for RMNCAH monitoring compared to other cadres and educational levels. Interestingly, the analysis indicated that less experienced healthcare workers (0–4 years and 5–9 years of experience) were more likely to use scorecards compared to those with longer tenure (10+ years of experience). These findings underscore the need to consider the varying perspectives and experiences of healthcare workers when promoting the use of scorecards for RMNCAH performance monitoring. Tailoring implementation strategies to address the unique needs and concerns of both experienced and less experienced healthcare workers, as well as those with different educational backgrounds, may be crucial for enhancing the widespread adoption and effective use of these tools.

Ethical Consideration

The study sought approval from the Kenyatta University Ethical Review Committee and the National Council for Science, Technology, and Innovation (NACOSTI), who reviewed and approved the study protocol. We obtained additional permits to conduct the research from the County and Sub-Counties Health Directors of Kwale and Kilifi counties, and obtained informed consent from the study participants. We strictly adhered to the study protocol when administering the study tool. We informed the participants that their participation was purely voluntary and they could withdraw from the study at any time. We assigned unique identifiers to the participants, stored their personal information in a password-protected computer database, and secured all paper records in a locked file cabinet.

Participants were also given the freedom to withdraw from the study at any one time without being penalized for their actions and this was well explained to the participants before the consent was sought from them. This protocol allowed participants to feel safe in their choice whether to continue participating or to discontinue and that their choices are honored. Further, in cases where participants provide suboptimal responses, the research team ensured that we engaged the participants and seek to clarify issues on the questionnaire or even provide our assistance to enable the participants complete the questionnaire optimally. By being proactive in the approach, little data was lost, yet much consideration was made to ensure that everyone was treated with respect.

Abbreviations

RMNCAH: Reproductive, Maternal, Newborn, Child, and Adolescent Health; NACOSTI: National Council for Science, Technology and Innovation; WHO: World Health Organization; RCO: Reproductive and Child Health Officer

Competing Interests

Authors have declared that there are no competing interests

Author Contributions

The study was put together and designed by GNM and the first author conducted the study in Kilifi and Kwale, counties, Kenya. OJO carried out data analysis while IOM drafted the manuscript. GNM reviewed and prepared the manuscript. OJO, GOO and KKR gave their technical input during the development of the study.

Data Availability and Accessibility

Data is accessible from this link:

https://docs.google.com/spreadsheets/d/1wV4XOvODWCPV3sTUda2SAYuIBztWZyQn/edit?usp=sharing&ouid=103451194246583861757&rtpof=true&sd=true

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