



Relationship between Health Promotion Programs and Patient Health Literacy at Nyeri County Teaching and Referral Hospital

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Abstract

Health literacy is a key determinant of patient outcomes because it influences individuals' ability to obtain, understand, evaluate, and use health information for appropriate decision-making. This study examined the relationship between health promotion programs and patient health literacy at Nyeri County Teaching and Referral Hospital. A single-site case study design using a mixed-methods approach was adopted. The target population comprised 495 healthcare professionals, from whom a stratified sample of 222 was selected; 216 questionnaires were correctly completed and returned, representing a response rate of 97.3%. Quantitative data were collected through structured Likert-scale questionnaires and analyzed using descriptive statistics and Pearson correlation. Qualitative data were obtained from 15 key informant interviews involving 13 community health workers, one hospital administrator, and one county health director, and were analyzed thematically. Findings showed positive ratings for patient education workshops ($M = 4.12$, $SD = 0.85$), health information kiosks ($M = 4.00$, $SD = 0.92$), community outreach ($M = 4.08$, $SD = 0.83$), coaching sessions ($M = 4.03$, $SD = 0.87$), and maternal and child health education ($M = 4.05$, $SD = 0.84$). Patient health literacy outcomes were also rated positively, especially treatment adherence ($M = 4.08$, $SD = 0.85$) and disease management confidence ($M = 4.06$, $SD = 0.87$). Pearson correlation revealed a positive and statistically significant relationship between health promotion programs and patient health literacy ($r = 0.62$, $p < .05$). Qualitative findings indicated that workshops, simplified materials, local-language communication, home visits, and follow-up coaching supported patient understanding and behavior change. The study concludes that structured, accessible, and patient-centered health promotion programs are positively associated with patient health literacy. It recommends strengthening interactive patient education, simplifying and translating health information, expanding community outreach and follow-up coaching, and providing adequate institutional resources for health promotion.

Keywords: Community outreach; health literacy; health promotion programs; Nyeri County Teaching and Referral Hospital; patient-centered care; patient education

Introduction

Health literacy (HL) is central to patient empowerment because it enables patients to access, understand, and use health information in ways that support informed choices, treatment adherence, disease prevention, and self-management. Patients with adequate HL communicate more effectively with healthcare providers, recognize warning signs earlier, and participate more actively in treatment decisions, thereby improving the quality and continuity of care (Roodbeen et al., 2020; Ghorbanian Zolbin et al., 2022). Conversely, limited HL is associated with misunderstanding of medical instructions, medication errors, missed appointments, poor adherence, avoidable complications, and increased healthcare costs (Perrin et al., 2022).

Health promotion programs are organized interventions designed to strengthen patient knowledge, skills, confidence, and healthy behaviors. In hospital and community settings, these programs may include patient education workshops, health information kiosks, medication counseling, community outreach, nutrition and lifestyle coaching, maternal and child health education, peer support, and follow-up care. These interventions align with health-literate systems approaches because they shift responsibility from patients alone to the health system, requiring services to make information easier to access, understand, and apply (Sørensen et al., 2021).

The global and regional literature shows that health literacy remains unevenly distributed across populations. Language barriers, low literacy levels, cultural beliefs, poverty, limited access to reliable health information, and weak patient-provider communication can restrict patients' ability to benefit fully from healthcare services. In Sub-Saharan Africa, culturally grounded and context-specific communication is particularly important because patients often navigate multilingual environments and social norms that influence how health information is received and used (Olaoye & Onyenankaya, 2023; Organi et al., 2024).



In Kenya, health literacy remains relevant across both rural and urban health settings. Njuguna (2020), in a study on health literacy and the patients' rights charter among users of primary care facilities in Kiambu and Machakos counties, highlights the importance of patient understanding within Kenyan health services. Nyeri County Teaching and Referral Hospital serves a diverse population that includes rural and urban communities. Within this context, language differences, socioeconomic constraints, limited digital literacy, and time pressure among healthcare providers may reduce patients' understanding of diagnoses, treatment plans, medication instructions, preventive measures, and follow-up requirements. These realities justify a hospital-based assessment of the relationship between health promotion programs and patient health literacy.

The hospital has implemented health promotion initiatives that include patient education workshops, community outreach, coaching sessions, health information resources, and maternal and child health education. However, evidence on the measurable relationship between these programs and patient health literacy within the hospital context remains limited. This study therefore examined the relationship between health promotion programs and patient health literacy at Nyeri County Teaching and Referral Hospital using quantitative survey results and qualitative key informant evidence.

Literature orientation

Empirical literature supports the role of structured education and effective communication in improving patients' understanding of health information and engagement in care. Health literacy interventions have been linked to improved decision-making, self-efficacy, treatment adherence, and disease self-management, especially when programs are interactive and adapted to patient needs (Ghorbanian Zolbin et al., 2022). A systematic review of interventions to improve patient-provider communication further underscores communication as a central component of patient education (Aboumatar et al., 2013). Health-literate systems frameworks similarly emphasize simplified communication, staff capacity, accessible materials, and support across the care continuum (Sørensen et al., 2021), while hospital-focused literature recognizes improvement of patient health literacy as an important challenge for health education programs (Wang & Lo, 2021).

Evidence from Kenya and other African contexts suggests that community education, patient-centered communication, and culturally appropriate health promotion are important for preventive behavior and chronic disease management (Njuguna, 2020; Olaoye & Onyenankaya, 2023). Recent work evaluating health literacy practices within a primary care system serving a diabetic population also illustrates the value of examining health literacy as an organizational practice rather than only as an individual patient attribute (Norris-Bermudez, 2024). Nevertheless, many studies are community-based, disease-specific, or not directly linked to hospital-based patient health literacy outcomes. This leaves a gap in understanding how hospital-led health promotion programs relate to patient confidence, adherence, lifestyle knowledge, reproductive health understanding, and practical use of health information at Nyeri County Teaching and

Methodology

The study adopted a single-site case study design using a mixed-methods approach. The design was suitable because it enabled quantitative measurement of health promotion programs and provider-rated patient health literacy outcomes while also capturing contextual explanations from key informants. The study site was Nyeri County Teaching and Referral Hospital, a major referral facility serving diverse patient groups in central Kenya.

The target population comprised 495 healthcare professionals working in the hospital, including medical doctors, clinical officers, nurses, community health officers, pharmacists, nutritionists, health records officers, social workers, health educator officers, and allied health professionals. A stratified random sampling procedure was used to ensure representation across professional cadres. Using Yamane's (1967) formula at a 5% margin of error, a sample size of 222 respondents was selected. The final quantitative analysis was based on 216 completed questionnaires.

Structured questionnaires were used to collect quantitative data on demographic characteristics, health promotion activities, and patient health literacy outcomes. The questionnaire used a five-point Likert scale ranging from strongly disagree to strongly agree. Healthcare providers were used as proxy reporters because of their continuous interaction with patients during treatment, counseling, education, and follow-up. Qualitative



data were collected through 15 key informant interviews involving 13 community health workers, one hospital administrator, and one county health director.

Validity was strengthened through expert review of the questionnaire and interview guide. Reliability was assessed through a pretest involving 40 healthcare workers from Embu County Referral Hospital, a comparable Level 5 public hospital. Cronbach's alpha for the structured questionnaire section on health promotion programs and health literacy variables was 0.82, exceeding the minimum acceptable threshold of 0.70. Quantitative data were analyzed using frequencies, percentages, means, standard deviations, and Pearson correlation. Qualitative data were analyzed thematically and triangulated with quantitative findings. Ethical approval, institutional authorization, informed consent, confidentiality, anonymity, and voluntary participation were observed throughout the study.

Results and Discussion

This section presents the quantitative and qualitative findings on health promotion programs and their relationship with patient health literacy. The results identify relative patterns, practical implications, and areas that require attention. The discussion also relates the findings to relevant literature while distinguishing association from causation.

Table 1: Response rate on data collection through questionnaires (n = 222)

Response category	Frequency	Percentage (%)
Questionnaires returned	216	97.3
Questionnaires not returned	6	2.7
Total	222	100.0

Table 1 shows that 216 of the 222 distributed questionnaires were correctly completed and returned, giving a response rate of 97.3%, while only 2.7% were not returned. The high response rate means that the quantitative analysis drew on almost the entire intended sample and reduces concern that the findings reflect only a small subgroup of the selected healthcare professionals.

Table 2: Demographic Profile of Respondents (N = 216)

Variable	Category	Frequency	Percentage
Age	25-30 years	63	29.2
	30-40 years	82	38.0
	40-50 years	56	25.9
	Over 55 years	15	6.9
Gender	Female	122	56.5
	Male	94	43.5
Education	Diploma	86	39.8
	Bachelor's degree	98	45.4
	Master's degree or higher	32	14.8
Length of service	1-5 years	62	28.7
	6-10 years	74	34.3
	11-15 years	48	22.2
	More than 15 years	32	14.8
	Medical doctors	8	3.7
	Medical doctor specialists	7	3.2
	Clinical officers	14	6.5
	Dentists	4	1.9



Variable	Category	Frequency	Percentage
Cadre	Community health officers	26	12.0
	Nurses	94	43.5
	Laboratory officers	12	5.6
	Physiotherapists/occupational health	8	3.7
	Radiologists/radiographers	4	1.9
	Pharmacists/pharmaceutical technologists	6	2.8
	Mental health workers	4	1.9
	Nutritionists/dieticians	5	2.3
	Health records and information officers	4	1.9
	Social workers	11	5.1
	Health educator officers	9	4.2

The demographic profile shows that respondents had varied professional and service backgrounds relevant to patient education and care. The largest age group was 30-40 years (38.0%), followed by 25-30 years (29.2%). Women represented 56.5% of respondents and men 43.5%. Most respondents held a bachelor's degree (45.4%) or diploma (39.8%), and 34.3% had served for 6-10 years. Nurses formed the largest professional cadre (43.5%), followed by community health officers (12.0%). This composition provides substantial input from cadres with frequent patient contact, although the dominance of nurses should be considered when interpreting the extent to which the results represent smaller specialist cadres.

Table 3: Effectiveness of Health Promotion Programs in Enhancing Patient Health Literacy (N = 216)

Statement	SD (1)	D (2)	N (3)	A (4)	SA (5)	Mean	Std. Dev.
Patient education workshops have helped patients better understand health conditions.	5 (2.3%)	10 (4.6%)	20 (9.3%)	120 (55.6%)	61 (28.2%)	4.12	0.85
Health information kiosks provide easy-to-understand health materials.	8 (3.7%)	15 (6.9%)	30 (13.9%)	110 (50.9%)	53 (24.5%)	4.00	0.92
Community outreach programs have increased awareness of preventive health measures.	4 (1.9%)	12 (5.6%)	25 (11.6%)	50 (23.1%)	125 (57.9%)	4.08	0.83
Coaching sessions have motivated staff to offer patient-centered care.	6 (2.8%)	14 (6.5%)	28 (13.0%)	50 (23.1%)	118 (54.6%)	4.03	0.87
Maternal and child health education programs have improved reproductive health knowledge.	5 (2.3%)	10 (4.6%)	35 (16.2%)	51 (23.6%)	115 (53.2%)	4.05	0.84

Results in Table 3 show consistently positive ratings of the health promotion programs. The reported means ranged narrowly from 4.00 to 4.12, indicating that no program area was rated poorly. Patient education workshops recorded the highest mean ($M = 4.12$, $SD = 0.85$), followed by community outreach ($M = 4.08$, $SD = 0.83$), maternal and child health education ($M = 4.05$, $SD = 0.84$), coaching sessions ($M = 4.03$, $SD = 0.87$), and health information kiosks ($M = 4.00$, $SD = 0.92$). The pattern suggests that respondents valued multiple delivery channels, with interactive workshops and outreach rated slightly more favorably than information kiosks. This finding is consistent with literature that emphasizes interactive and accessible health literacy interventions (Ghorbanian Zolbin et al., 2022) and health-literate systems that simplify communication and provide organizational support (Sørensen et al., 2021). It also accords with the emphasis on patient-provider



communication in Aboumatar et al. (2013) and context-sensitive health communication in Sub-Saharan Africa reported by Olaoye and Onyenankaya (2023).

Table 4: Patient Health Literacy Outcomes (N = 216)

Statement	SD (1)	D (2)	N (3)	A (4)	SA (5)	Mean	Std. Dev.
Patients demonstrate confidence in managing their diseases or health conditions.	6 (2.8%)	12 (5.6%)	18 (8.3%)	125 (57.9%)	55 (25.5%)	4.06	0.87
Patients are capable of making informed decisions about their health.	5 (2.3%)	14 (6.5%)	22 (10.2%)	120 (55.6%)	55 (25.5%)	4.03	0.88
Patients consistently follow treatment plans prescribed by healthcare providers.	4 (1.9%)	10 (4.6%)	25 (11.6%)	125 (57.9%)	52 (24.1%)	4.08	0.85
Patients have sufficient knowledge about nutrition and healthy lifestyle practices.	7 (3.2%)	12 (5.6%)	28 (13.0%)	118 (54.6%)	51 (23.6%)	4.00	0.89
Patients understand reproductive health information and how to apply it.	5 (2.3%)	10 (4.6%)	30 (13.9%)	120 (55.6%)	51 (23.6%)	4.01	0.86

Table 4 shows favorable provider-rated patient health literacy outcomes across all measured domains. Treatment adherence had the highest reported mean ($M = 4.08$, $SD = 0.85$), followed by disease management confidence ($M = 4.06$, $SD = 0.87$) and informed health decision-making ($M = 4.03$, $SD = 0.88$). Reproductive health understanding ($M = 4.01$, $SD = 0.86$) and nutrition and lifestyle knowledge ($M = 4.00$, $SD = 0.89$) were also positively rated, although they were comparatively lower. The pattern indicates that respondents associated health promotion most strongly with practical treatment behaviors and self-management confidence, while nutrition and reproductive health remain areas for continued strengthening. These findings are compatible with literature linking health literacy to disease management and adherence (Perrin et al., 2022), communication and shared decision-making (Roodbeen et al., 2020), and the broader challenge of improving patient health literacy through hospital health education programs (Wang & Lo, 2021).

Table 5: Pearson Correlation between Health Promotion Programs and Patient Health Literacy

Variables	Health promotion programs	Patient health literacy
Health promotion programs	1	0.62*
Patient health literacy	0.62*	1

. *Correlation significant at $p < .05$.

Table 5 indicates a positive and statistically significant relationship between health promotion programs and patient health literacy ($r = 0.62$, $p < .05$). The magnitude represents a moderately strong positive association: higher ratings of the availability, accessibility, and delivery of health promotion programs tended to occur alongside higher provider-rated patient health literacy outcomes. Squaring the correlation coefficient gives approximately 0.38, indicating about 38% shared variance between the two measured constructs. This should not be interpreted as proof that health promotion programs caused the literacy outcomes because the study used a single-site, non-experimental design and proxy reports. Nevertheless, the association is consistent with health literacy intervention literature (Ghorbanian Zolbin et al., 2022), system-level health literacy frameworks (Sørensen et al., 2021), and the organizational focus of health literacy practice evaluations such as Norris-Bermudez (2024).

Table 6: Qualitative Themes from Key Informant Interviews

Objective area	Theme	Recurrent evidence	Interpretation
Effectiveness of programs	Patient education workshops	Improved understanding of health conditions (13 mentions);	Workshops simplified complex medical information



<i>Objective area</i>	<i>Theme</i>	<i>Recurrent evidence</i>	<i>Interpretation</i>
Effectiveness of programs	Accessibility and clarity of materials	increased awareness and behavior change (11); interactive learning approaches (9). Simple language (10 mentions); translation into local languages (9); visual aids and illustrations (8).	and made patients more willing to follow instructions. Materials worked best when written in plain language, translated where necessary, and supported with pictures.
Effectiveness of programs	Outreach and coaching interventions	Home visits and community outreach (12 mentions); increased motivation (10); personalized coaching (9).	Home visits and follow-up helped tailor advice to patients' home situations and reinforced adherence.
Relationship with health literacy	Confidence and self-efficacy	Confidence in managing conditions (12 mentions); self-efficacy (10); informed decision-making (9).	Patients who attended sessions became more confident in managing conditions and making decisions.
Relationship with health literacy	Barriers to adherence and literacy	Financial constraints (11 mentions); low literacy (9); cultural beliefs (8); inconsistent follow-up (7).	Education alone was insufficient where poverty, beliefs, literacy limitations, and weak follow-up restricted application.
Relationship with health literacy	Knowledge and remaining gaps	Nutrition and healthy lifestyle knowledge (12 mentions); disease prevention awareness (10); reproductive health gaps (9).	General knowledge improved, but reproductive health education required more targeted and culturally sensitive support.

The qualitative findings in Table 6 support and help explain the quantitative patterns. Key informants repeatedly identified workshops, demonstrations, local-language communication, pictorial materials, home visits, and coaching as mechanisms that made health information easier for patients to understand and apply. These themes help explain why direct education and outreach received positive quantitative ratings. They also align with literature on patient-provider communication (Aboumatar et al., 2013), practical communication strategies for people with limited health literacy (Roodbeen et al., 2020), and the importance of addressing language barriers in healthcare (Organi et al., 2024). The emphasis on culturally and linguistically appropriate communication is also consistent with health communication evidence from Sub-Saharan Africa (Olaoye & Onyenankaya, 2023) and with the Kenyan relevance of health literacy highlighted by Njuguna (2020).

Triangulation also revealed barriers that qualify the positive survey findings. Financial constraints, low literacy levels, cultural beliefs, and inconsistent follow-up could prevent patients from translating knowledge into sustained behavior change even when education had been provided. This helps explain why a substantial, but not perfect, correlation was observed between health promotion programs and patient health literacy. The finding reinforces the health-literate systems perspective that effective communication must be supported by organizational processes and accessible services (Sørensen et al., 2021). It also suggests that language and communication barriers cannot be addressed by written information alone (Organi et al., 2024). Because patient health literacy was assessed through healthcare professionals as proxy reporters in one hospital, the findings should be interpreted as provider perceptions of patient literacy outcomes rather than direct patient-reported measures, and causal conclusions should be avoided.



Conclusion

The study established that health promotion programs at Nyeri County Teaching and Referral Hospital are positively associated with provider-rated patient health literacy. Survey findings showed favorable ratings for patient education workshops, health information kiosks, community outreach, coaching sessions, and maternal and child health education programs. Patient health literacy outcomes were also rated positively, particularly treatment adherence, disease management confidence, informed decision-making, nutrition and lifestyle knowledge, and reproductive health understanding.

Correlation analysis confirmed a moderately strong, positive, and statistically significant relationship between health promotion programs and patient health literacy. Qualitative evidence strengthened the interpretation by showing that interactive education, simplified materials, local-language communication, visual aids, home visits, and follow-up coaching made health information more understandable and actionable. However, financial constraints, low literacy, cultural beliefs, and inconsistent follow-up limited patients' ability to translate knowledge into sustained behavior change. Given the single-site, non-experimental design and use of healthcare professionals as proxy reporters, the findings indicate association rather than causation and should be generalized cautiously.

Recommendations

Nyeri County Teaching and Referral Hospital should strengthen patient education workshops by making them more interactive, practical, and disease-specific. Demonstrations, real-life examples, question-and-answer sessions, and patient feedback should be built into routine education sessions so that patients can clarify information before leaving the point of care.

The hospital should simplify and translate health education materials into languages commonly used by patients, including Kiswahili and Kikuyu where appropriate. Visual aids, pictorial instructions, and low-literacy materials should be prioritized, especially for medication use, chronic disease management, maternal and child health, nutrition, reproductive health, and danger signs that require urgent care.

Community outreach and follow-up coaching should be expanded through community health workers because these approaches help patients apply health information within their home and community contexts. Flexible scheduling, multi-channel delivery, patient feedback, and stronger collaboration between hospital departments and community units should be adopted to improve access and continuity.

Hospital management and county health authorities should provide adequate staffing, training, space, and funding for health promotion programs. Future research should use direct patient-reported health literacy measures alongside provider observations and compare findings across referral hospitals to strengthen the generalizability of evidence on hospital-based health literacy interventions in Kenya.

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