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EVALUATING THE COMMUNICATIVE EFFECTIVENESS OF MULTIMODAL MATERNAL AND CHILD HEALTHCARE TEXTS IN MACHAKOS COUNTY, KENYA: A SOCIAL SEMIOTIC ANALYSIS

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Abstract:
Maternal and child healthcare communication materials are widely used in Kenyan health facilities, yet their communicative effectiveness remains uncertain. This study evaluated the communicative effectiveness of multimodal maternal and child healthcare texts used in public health facilities in Machakos County, Kenya. Specifically, it sought to determine how effectively posters, brochures, and the national Mother and Child Health Handbook disseminate health information to expectant women and mothers of children aged 0–5 years. The study was anchored on an integrated theoretical framework incorporating Kress and van Leeuwen's (2006) Social Semiotic Theory, which focused on analysing the visual mode; Halliday and Mathiessen's (2014) focus on analysing the verbal mode; and Royce's (2007) intersemiotic complementarity, which focused on analysing the interaction of the verbal and visual modes. The World Health Organisation framework of principles of effective communication was applied in evaluating the effectiveness of the MCH texts. An exploratory mixed-methods design was adopted, with qualitative analysis supported by quantitative descriptions of semiotic features. Data were drawn from 26 MCH texts comprising 18 posters, seven brochures, and one Mother and Child Health Handbook across ten public health facilities, together with key

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informant interviews and focus group discussions involving healthcare providers and intended users. Findings show that posters are the most effective because they integrate simple language, salient images, colour, and clear visual organisation; brochures are moderately effective, while the MCH Handbook is least effective as a standalone communication tool. Effectiveness is further constrained by technical terminology, English-dominant content, sociocultural mismatch, participant exclusion, disability-related accessibility gaps, weak visual hierarchy, and fragmented sequencing. The study concludes that communicative effectiveness depends on the meaningful integration of verbal and visual resources within users' linguistic, cultural, and social contexts. The study therefore recommends simplifying technical language, expanding multilingual content, strengthening inclusive and culturally grounded representation, improving visual hierarchy and sequencing, and redesigning the MCH Handbook to support independent use by mothers and caregivers.

Keywords: multimodality, maternal and child health, health communication, Visual Social Semiotics, information dissemination, Machakos County

1. Introduction

1.1 Background of the Study

Provision of maternal and child healthcare (MCH) is fundamentally anchored in the human rights to life, health, equality, and non-discrimination (World Health Organisation [WHO], 2023). A nation's ability to guarantee child survival is a critical indicator of overall social development, which depends heavily on robust health system interventions, central to which is effective health communication (Nutbeam, 2000). Serving as the vital bridge between clinical policy and community action, health communication delivers actionable messages through accessible media to shape health-seeking behaviours and reduce maternal and under-five mortality. Globally, despite significant public health advancements, MCH outcomes remain a pressing concern, particularly in Sub-Saharan Africa (WHO, 2021). In Kenya, national initiatives and county government health investments have improved structural access; however, communication challenges continue to limit the optimal utilisation of antenatal care (ANC), skilled birth attendance, postnatal care (PNC), and child health services (MOH,2018).

Contemporary health education has increasingly shifted from traditional, text-dense literacy approaches toward multimodal communication. Rather than relying solely on written prose, modern MCH materials such as posters, brochures, and handbooks combine verbal language with visual semiotic resources (e.g., imagery, typography, colour, and spatial arrangement) to convey complex clinical information (Houts *et al.*, 2006). In contexts characterised by varying levels of health literacy and language competence, multimodal texts offer distinct communicative affordances. Visual modes attract attention, facilitate recall, and anchor abstract concepts, while linguistic elements

specify, elaborate, and provide contextual clarity (WHO, 2017; UNICEF, 2022). Grounded in Kress and van Leeuwen's (2006) Social Semiotics framework, meaning-making in these texts relies on the interdependent interaction between verbal and visual modes, where each mode compensates for the limitations of the other.

This multimodal synergy is increasingly reinforced by global empirical evidence. Systematic reviews demonstrate that visual resources significantly enhance patient comprehension and knowledge retention when integrated functionally rather than decoratively. For instance, Schubbe *et al.* (2020) and Galmarini *et al.* (2024) established that pictorial health materials substantially improve understanding and recall among populations with limited health literacy. Similarly, Mbanda *et al.* (2021) identified pictograms and visual media as primary facilitators of comprehension in low-literacy settings. However, multimodal effectiveness extends beyond visual appeal; it requires linguistic accessibility and cultural resonance. Studies by Al Shamsi *et al.* (2020), Gray *et al.* (2024) emphasise that language barriers exacerbate miscommunication, whereas culturally adapted and audience-centred health resources lead to significantly better health outcomes.

The WHO Strategic Communication Framework highlights six core principles: accessibility, actionability, credibility, relevance, timeliness, and understandability (WHO, 2017; Zhao, 2020). The *understandability* principle specifically advocates for plain language, logical structure (prioritising critical information), appropriate white space, visual integration, and localised translations. When MCH materials adhere to these design requirements, they empower mothers and caregivers to make timely and informed healthcare decisions.

In Kenya, while researchers have acknowledged the importance of MCH communication tools, the existing evidence base remains methodologically narrow. Prior studies have largely focused on measuring intervention exposure and downstream health outcomes. For example, Kawakatsu *et al.* (2015) associated MCH Handbook possession with improved knowledge in Western Kenya, and Schneider *et al.* (2021) demonstrated the impact of educational video exposure on infant feeding in Nairobi and Machakos. These studies evaluate health materials primarily as passive artefacts or vehicles of exposure, failing to analyse their internal multimodal architecture, linguistic readability, or semiotic effectiveness.

Consequently, a critical knowledge gap remains regarding *how* the multimodal design of MCH materials, specifically posters, brochures, and the national MCH Handbook, functions to facilitate or hinder understanding among diverse patient groups in Machakos County hospitals. This study addresses this empirical gap by evaluating the communicative effectiveness of MCH texts through the combined lenses of multimodality, social semiotics and the WHO understandability framework.

1.2 Statement of the Problem

Despite the availability of multimodal texts such as posters, brochures, and mother and child booklets in maternal and child health communication, there is a lack of

comprehensive evidence regarding their effectiveness in conveying critical health messages towards the reduction of maternal and child mortality rates. The understanding of how multimodal texts influence comprehension, information retention, and engagement among expectant women and mothers of children below 5 years is essential for improving education, support, and information dissemination in maternal and child health care. This study, therefore, seeks to evaluate the effectiveness of multimodal maternal and child health texts as information dissemination tools in Machakos County hospitals, given that in Kenya, health is a devolved function and the attainment of the SDGs and MDGs is collectively in the counties.

1.3 Research Objective

The following objective guided the study:

- To evaluate the effectiveness of multimodal maternal and child healthcare texts as information dissemination tools.

1.4 Research Question

The study sought to answer the following research question:

- How effective are the multimodal maternal and child healthcare texts in information dissemination?

2. Literature Review

This section presents the empirical literature and the theoretical review relevant to the effectiveness of multimodal maternal and child healthcare texts as information dissemination tools.

2.1 Empirical Literature Review

This section reviews empirical studies on the effectiveness of multimodal health communication and maternal and child health communication materials.

2.1.1 Effectiveness of Multimodal Health Communication

Multimodal health communication combines words with visual resources to make information easier to understand and remember. Schubbe *et al.* (2020) reviewed 54 randomised controlled trials and found that pictorial health information improved knowledge, understanding, and recall, with stronger gains among people with lower health literacy. Mbanda *et al.* (2021) reached a similar conclusion after reviewing 47 studies, noting that pictograms and videos were especially useful for low-literacy audiences. More recently, Galmarini *et al.* (2024) found across 28 studies that visual-based interventions improved comprehension, particularly when videos were compared with written materials. These findings support integration of visual and verbal resources.

However, the effectiveness of multimodal health messages depends on more than simply adding pictures to written information. Schubbe *et al.* (2020) cautioned that

outcomes varied across studies, showing that visual design, audience characteristics, and communication context influence effectiveness. Mbanda *et al.* (2021) found that visual aids developed with low-literacy users produced stronger health-literacy outcomes, highlighting the value of audience participation during design. Galmarini *et al.* (2024) also reported that videos were not significantly better than oral discussion in some comparisons. This evidence suggests that multimodal health communication works best when visual resources are meaningful, audience-sensitive, and integrated with interpersonal communication.

2.1.2 Effectiveness of Maternal and Child Health Communication Texts

Maternal and child health communication materials have been used in Kenya to support health knowledge, service use, and caregiving practices. Kawakatsu *et al.* (2015) studied 2,560 mothers in western Kenya and found that possession of the Mother and Child Health Handbook was associated with better health knowledge and appropriate care-seeking for childhood fever and diarrhoea. This finding suggests that the handbook can function as a useful health communication resource when mothers are able to access and use it effectively. It also indicates that the handbook's value lies not only in the information it contains, but in the extent to which users can interpret and apply that information in everyday child health decisions. Mudany *et al.* (2015) similarly reported that the introduction of the combined Mother and Child Health Booklet in Nyanza was followed by a 34% increase in infant HIV DNA testing during its pilot period. This result points to the booklet's potential to improve uptake of specific health services when it is integrated into routine maternal and child healthcare. Together, these studies show that MCH materials can support health behaviours and services when they are accessible, credible, and embedded in practical care settings.

Kenyan evidence also shows that the usefulness of MCH communication depends on how information is presented and explained to mothers. Schneider *et al.* (2021) found that repeated exposure to infant and young child-feeding videos in Nairobi and Machakos was associated with better complementary-feeding knowledge and hygiene practices. This implies that repeated multimodal exposure can strengthen both understanding and behavioural uptake, especially when the message is delivered in a format that combines visual and verbal meaning. The study is important because it shows that communication effectiveness is not achieved through information provision alone, but through repetition, visual support, and audience familiarity with the message. In a similar vein, the present study's findings suggest that MCH texts are more effective when they support independent understanding rather than relying entirely on health-worker explanation. Together, these studies highlight the importance of design, context, and audience support in maternal and child health communication.

2.2 Theoretical Review

This study is based on an integrated framework that incorporates three complementary theoretical perspectives. The visual social semiotic theory by Kress and van Leeuwen

(2006) explains how visuals function as meaning-making resources through representational, interactive and compositional meaning. This framework examines how visual elements in the maternal and child health texts depict actors and health practices in contextualised settings. It also examines how social relations are constructed and how information is organised on a page (Kress & van Leeuwen, 2006).

Systemic Functional Linguistics (SFL), originally advanced by Halliday (1978) and later expanded by Halliday and Matthiessen (2014), explains how language realises ideational, interpersonal and textual meanings. In this study, SFL was used to analyse how the verbal mode presents health information, positions the audience and structures messages for coherence and clarity in the MCH texts (Halliday & Matthiessen, 2014).

Royce's (2007) framework of intersemiotic complementarity examines how the verbal and the visual modes synergistically work together in a multimodal ensemble through semantic relations of repetition, synonymy, hyponymy, collocations and other forms. This framework evaluates whether the texts reinforce, elaborate or complement meaning across the modes (Royce, 2007). Together, these theories provide a basis for analysing how maternal and child health texts communicate meaning and their effectiveness in disseminating MCH information.

3. Research Methodology

The study adopted an exploratory mixed-methods design, with greater emphasis on qualitative analysis, to examine the effectiveness of multimodal maternal and child healthcare texts as information dissemination tools. This approach allowed qualitative interpretation to be supported by quantitative descriptions of semiotic features identified in the texts (Creswell & Plano Clark, 2018). The study was conducted in ten public health facilities in Machakos County representing Levels 2, 3, 4, and 5 of healthcare. The corpus comprised 26 multimodal MCH texts, including 18 posters, seven brochures, and one national Mother and Child Health Handbook, 50 health care providers and 360 mothers/ expectant women. The participants were selected based on stratified random sampling for focus group discussions and stratified purposive sampling for key informant interviews (Krueger & Casey, 2000).

Document analysis examined visual and verbal resources, while key informant interviews and focus group discussions explored how healthcare providers and intended users understood and used the materials. The texts were analysed using a multimodal discourse analysis informed by Kress and van Leeuwen's (2006) Social Semiotic theory, Halliday and Matthiessen's (2014) Systemic Functional Linguistics and Royce's (2007) intersemiotic complementarity. Key informant interviews and focus group discussions data were thematically analysed to assess how service providers and intended users interpreted the MCH texts. Thematic analysis organised related responses into meaningful patterns (Braun & Clarke, 2006). The textual and thematic analyses were combined to evaluate the effectiveness of posters, brochures, and the national MCH Handbook using the six WHO principles of effective communication. The study

considered ethical approval, informed consent, confidentiality, and voluntary participation were maintained throughout all stages of research.

4. Findings and Discussion

This section presents the findings on the effectiveness of multimodal maternal and child healthcare texts.

4.1 Overall Effectiveness of Multimodal MCH Texts

The evaluation of the three MCH text types produced clear differences based on the six WHO principles of effective communication. Posters met actionability, credibility and trustworthiness, relevance, timeliness, and understandability, while accessibility was partially met. Brochures met credibility, relevance, and timeliness, but did not meet accessibility and understandability, while actionability was weak. The MCH Handbook fully met only credibility, partially met relevance and timeliness, did not meet accessibility and understandability, and was weak in actionability. Credibility was therefore the only communication principle achieved across all three text types. Overall, posters performed better than brochures and the MCH Handbook, while the handbook recorded the greatest number of communication limitations.

The KII and FGD results provided further evidence of these differences. In reference to the posters, one healthcare provider explained, *"When mothers see the message written and also see the picture showing what to do, the information becomes easier to understand. Even those who may not read all the words can still get the message"* (KI-MKS-03). Another reported that brochures were normally given to mothers during health talks and then explained to strengthen understanding and recall (KI-MLG-02). A mother similarly reported that the breastfeeding poster attracted her attention because of the image of a breastfeeding woman (FGD-MKS-5). In contrast, one mother stated, *"I don't understand the information in the MCH handbook, but the nurse explains, and I understand"* (FGD-MMD-01).

These findings indicate that the MCH materials were useful, but their effectiveness depended on how successfully their verbal and visual resources supported independent understanding. Posters were more effective because written messages were reinforced by visible representations of the health practices being communicated. This made information easier to notice, recognise, and interpret without mediation from healthcare workers. The findings align with Kress and van Leeuwen's (2006) Visual Social Semiotic Theory, which argues that communicative meaning is realised through the interaction of representational, interactive, and compositional resources. These findings therefore suggest that multimodality becomes effective when visual resources function to clarify and elaborate written information rather than merely accompany it. When visuals are redundant or decorative, comprehension is limited; when they are integrated, they enable autonomous meaning-making.

The weaker performance of brochures and the MCH Handbook further indicates that providing accurate information does not necessarily guarantee effective communication. Their dependence on healthcare workers for explanation suggests that some meanings were not sufficiently accessible through the printed materials alone. They required professional explanation, indicating that textual information requires mediation to be accessible. The findings reveal that the communicative value of the MCH texts depends on how language, visual design, organisation, cultural relevance, and healthcare-worker support are combined within a particular setting.

4.2 Multimodal Features Enhancing Information Dissemination

The results show that verbal-visual integration enhances understanding by making health practices and risks more concrete. In the breastfeeding poster, the instruction *"Breastfeed your baby exclusively for the first six months"* appears alongside an image of a mother breastfeeding. KI-MKS-03 reports that mothers understand the message more easily when they see both words and pictures, while FGD-MKS-5 identifies the breastfeeding image as the first feature attracting attention. Similar reinforcement occurs in danger-sign materials, where images of bleeding are paired with phrases such as *"vaginal bleeding"* and *"heavy bleeding after birth."* These findings support Kress and van Leeuwen's (2006) representational meaning. Algabbani *et al.* (2022) similarly report improved comprehension when health information includes pictograms.

The results also show that cultural familiarity and interpersonal appeal strengthen information dissemination. Nutrition texts combine the verbal concept *"balanced diet"* with images of locally available foods such as beans, sukuma wiki, fruits, porridge, and ugali. KI-EKL-01 reports that these images help expectant women identify what they can eat, while FGD-MAT-02 states that the food wheel makes the message relatable to foods available at home. Mothers also respond positively to supportive imagery. KI-KAT-03 reports a stronger connection with posters because of their images and colour cues, while FGD-NGU-04 considers posters showing a smiling mother and baby particularly effective.

Compositional features further influence attention and usability. KI-EKL-02 reports that spatially organised texts attract mothers, whereas crowded materials are often ignored. KI-MLG-03 identifies images and colour codes as key features drawing attention to posters, while KI-MKS-04 reports that sequentially organised brochures are easier to follow. FGD-MLG-01 similarly states that posters with bold, large fonts are easier to read than the MCH Handbook, which uses smaller print. These findings demonstrate the importance of salience, typography, spacing, and sequencing in guiding readers towards key information.

4.3 Constraints to Effective Information Dissemination

The findings show that technical language, omitted explanations, and verbal density constrain independent understanding of MCH information. FGD-MKS-04 reports that some materials identify childhood danger signs and advise clinic attendance but do not

explain their causes, reasons for seeking care, or possible first aid. KI-NGU-04 describes the MCH Handbook as a "nurse's book" because it contains medical terms mothers do not understand, while FGD-MLG-03 states that difficult words require a nurse's explanation. KI-NGU-01 further reports that nurses mainly open the handbook to record weight and return dates, whereas mothers mostly check appointment dates. These results indicate that medically accurate content can be communicatively inaccessible constraining meaning interpretation.

Limited linguistic accessibility is also evident in the results. FGD-KTH-01 states, *"I can't read English, but Kiswahili and Kikamba I can read,"* while FGD-EKL-02 reports looking only at pictures because facility posters are written in English. KI-KDO-03 adds that mothers are more attentive during Group ANC classes when Kikamba is used, and KI-MKS-03 reports writing critical information in Kikamba on Manila paper for mothers who cannot read English. These findings indicate that language choice determines whether other semiotic resources can be meaningfully accessed.

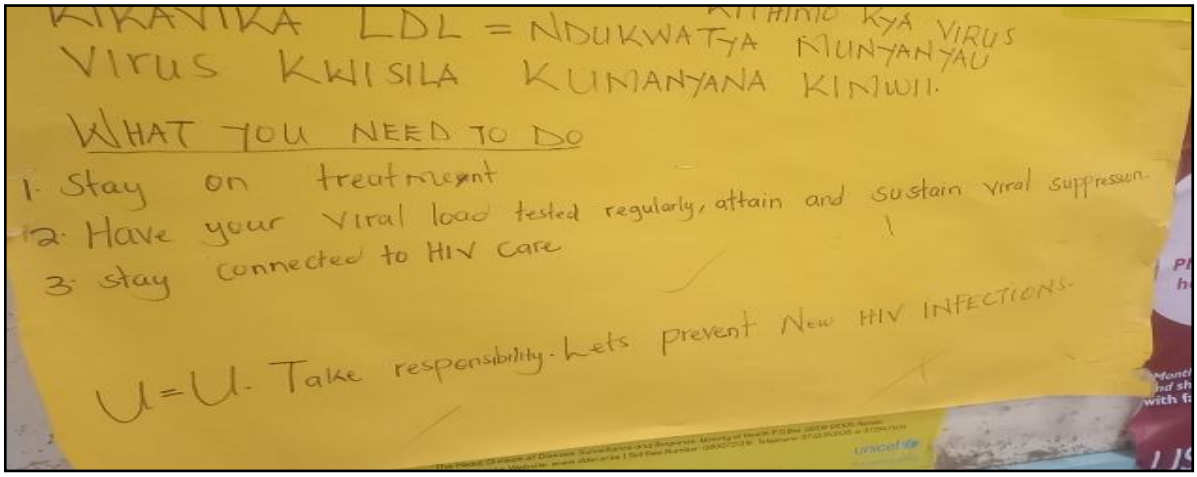

Figure 1: Viral load testing (Adapted from Machakos Level 5 Hospital, 2025)
This text is a health education tool with Kikamba translation aimed at explaining to pregnant women the importance of regular viral load testing to monitor treatment, achieve viral suppression and prevent mother-to child- transmission of HIV.
Source: Machakos Level 5

Figure 1: Viral Load Testing Information with Kikamba Translation
Adapted from the original Figure 7.1: Viral Load Testing, Machakos Level 5 Hospital, 2025.

The figure presents viral-load information in Kikamba and English and illustrates the local adaptation used by healthcare workers to improve linguistic accessibility. The results further show the exclusion of important social participants and communication needs. KI-MAT-03 reports that fathers are encouraged to attend clinics but their roles are not defined, while FGD-EKL-04 notes the absence of images showing fathers cooking, fetching water, washing baby clothes, or bathing babies. KI-MWL-03 identifies grandmothers as key village decision-makers who are not directly addressed by the texts. Disability-related exclusion is also evident: KI-MKS-4 reports reliance on one-to-one

communication for blind and deaf mothers because existing materials do not accommodate their needs. These results reveal narrow representational and interactive constructions of the intended audience. James *et al.* (2023) similarly document communication-access challenges among deaf and hard-of-hearing people during pregnancy.

Compositional constraints are evident in weak visual hierarchy and fragmented sequencing. KI-MWL-02 reports that mothers focus more on images than written messages, while FGD-MMD-03 states, *"I only look at the images in the text; I rarely read the information in them."* KI-GKP-01 reports that the MCH Handbook mixes ANC content with child growth and monitoring, and KI-MKS-01 identifies a sequence in which childbirth positioning, breastfeeding attachment, and neonatal assessment do not follow clinical practice. These results indicate that salience and sequencing can disrupt reading paths and comprehension. However, Balogun *et al.* (2023) find that an MCH handbook intervention increases ANC initiation in Angola, showing that handbook limitations are context-dependent.

4.4 Comparative Effectiveness of Posters, Brochures and the MCH Handbook

The comparative effectiveness of the three MCH text types is summarised in Table 1 using the six WHO principles of effective communication.

Table 1: Comparative Effectiveness of MCH Texts Based on WHO Effective Communication Principles

WHO Principle	Posters	Brochures	MCH Handbook	Evidence from Data
Accessible	Partially Met	Not Met	Not Met	Medical jargon reduces accessibility in brochures and the MCH Handbook
Actionable	Met	Weak	Weak	Posters effectively integrate visual and verbal modes
Credible and Trusted	Met	Met	Met	MCH texts carry Ministry of Health branding, supporting source trust
Relevant	Met	Met	Partially Met	Posters and brochures address important topics; the MCH Handbook omits crucial information
Timely	Met	Met	Partially Met	Posters and brochures contain current information, while the MCH Handbook lacks some current information
Understandable	Met	Not Met	Not Met	Posters use simple lexis, while brochures and the MCH Handbook are verbally dense

The comparative pattern indicates that posters function most effectively because their verbal and visual resources are integrated in a form that supports immediate recognition and action. Their simple lexis, prominent images, and direct messages reduce the interpretive burden placed on mothers and caregivers, which explains why they meet five of the six WHO principles. From a visual social semiotic perspective, this reflects

stronger representational and compositional organisation, since meaning is made visible and important information is given greater salience. The findings therefore suggest that poster effectiveness derives from accessible design rather than from visual presence alone.

Brochures occupy an intermediate position because they remain credible, relevant, and timely but are weakened by limited accessibility, understandability, and actionability. This pattern suggests that informational richness can become a communicative disadvantage when readers must process dense wording or medical terminology before identifying the intended action. The finding is consistent with broader evidence showing that patient education materials frequently exceed recommended readability levels and therefore place unnecessary demands on readers. In the present study, brochures therefore retain informational value, but their effectiveness declines when verbal density outweighs visual and organisational support. The MCH Handbook performs weakest as a standalone information tool despite its institutional credibility, indicating that trust in the source does not automatically produce accessibility or understanding. Its dense language, weak actionability, and partially achieved relevance and timeliness limit independent use by mothers. This contrasts with Nishimura *et al.* (2023), whose systematic review and meta-analysis report positive effects of MCH handbooks on several maternal, newborn, and child health outcomes. The contrast suggests that the handbook format itself is not inherently ineffective. Rather, effectiveness depends on how content is written, organised, explained, and integrated into routine care. For Machakos County, the results point to the need for a readable, visually coherent, locally responsive handbook that supports mothers without continuous professional mediation.

5. Conclusion and Recommendations

This section presents the conclusions drawn from the evaluation of multimodal maternal and child healthcare texts and proposes recommendations for improving their effectiveness as information dissemination tools in Machakos County.

5.1 Conclusion

The study concludes that multimodal MCH texts are important sources of maternal and child health information, but their effectiveness as standalone communication tools varies considerably across posters, brochures, and the MCH Handbook. Posters emerge as the most effective because they combine relatively simple verbal messages with prominent images, colour, large fonts, and clear visual organisation. These features enhance attention, understanding, recognition of health risks, and interpretation of recommended practices. Brochures are moderately effective because they provide relevant and timely information, but their communicative value is reduced by dense language and medical terminology. The MCH Handbook is the least effective as an independent information tool despite its institutional importance and credibility.

The findings further establish that communicative effectiveness depends on the meaningful integration of verbal and visual resources rather than on the mere presence of multiple modes. MCH texts become more effective when images clarify written information, represent familiar people and practices, and translate abstract health concepts into recognisable experiences. Images of breastfeeding, maternal danger signs, and locally available foods demonstrate how visual representation can support understanding and make health information more applicable to mothers' everyday lives. Effective composition also depends on salience, spacing, typography, sequencing, and a clear reading path that enables users to identify important information without excessive effort.

However, several barriers weaken this multimodal effectiveness. Technical terminology, excessive verbal information, English-dominant content, missing explanations, sociocultural mismatch, limited representation of fathers and other influential community members, inadequate accommodation of women with disabilities, fear-oriented messages, weak visual hierarchy, and fragmented sequencing reduce accessibility and independent comprehension. Consequently, some mothers depend on healthcare workers to interpret information that should ideally be understandable from the materials themselves. The findings therefore demonstrate that effective MCH communication requires texts that are not only medically accurate and institutionally credible but also linguistically accessible, culturally grounded, visually coherent, inclusive, and practically actionable for their intended audiences.

5.2 Recommendations

First, the Ministry of Health and relevant county health authorities should revise MCH materials using plain, audience-appropriate language. Technical expressions should either be replaced with commonly understood alternatives or immediately explained using simple language and supporting visuals. Information about danger signs should move beyond naming symptoms and directing mothers to health facilities by providing appropriate explanations of why the condition requires attention and what immediate action should be taken. Particular attention should be given to the MCH Handbook because the findings show that its technical language and dense presentation increase dependence on nurses for interpretation and limit its effectiveness as a resource that mothers can independently read and use.

Second, linguistic accessibility should become a core consideration in the design of MCH communication. The findings demonstrate that English-only materials exclude some intended users, while the use of Kikamba during health education improves attention and comprehension. Critical MCH information should therefore be made available in accessible multilingual formats, particularly English, Kiswahili, and locally appropriate languages such as Kikamba. The practice already observed among healthcare workers of translating important health information into Kikamba provides evidence of the practical need for such adaptation. Multilingual design should be

incorporated formally during material development rather than depending on individual healthcare providers to translate information during clinic sessions.

Third, MCH texts should represent the social and cultural environment within which maternal and child health decisions are made. Fathers should be presented not merely as accompanying partners but as active participants with clearly illustrated roles in pregnancy, childcare, household support, and health decision-making. Materials should also acknowledge the influence of grandmothers and other community actors and directly address locally encountered practices such as herbal concoctions and gum cutting. Images, foods, clothing, healthcare settings, and everyday practices should reflect recognisable local realities so that users can identify themselves and their experiences within the messages. Greater county-level involvement in developing and adapting national materials would strengthen this contextual relevance.

Fourth, accessibility for women with disabilities should be integrated into MCH communication design. The existing reliance on one-to-one interaction for blind and deaf mothers shows that current printed materials do not adequately address diverse communication needs. Appropriate formats should include Braille materials where feasible, accessible visual communication, and strengthened sign-language support within MCH services. More broadly, designers should avoid constructing an assumed reader who can necessarily see, hear, read English, move independently, or process dense written information. Inclusive communication requires recognising different abilities from the design stage rather than providing accommodation only after communication barriers occur.

Finally, the compositional design of MCH materials should be improved through clear visual hierarchy, adequate spacing, readable font sizes, purposeful use of colour, logical sequencing, and stronger relationships between written and visual information. The MCH Handbook particularly requires reorganisation so that information follows the maternal and child health journey in a logical sequence that mothers can easily navigate. Health messages should also balance urgency with reassurance and practical guidance rather than relying excessively on commands or fear-based warnings. Before large-scale distribution, MCH materials should be tested with intended users to determine whether mothers can identify, understand, interpret, and act on the information without extensive professional explanation.

Conflict of Interest Statement

The authors declare that there is no conflict of interest

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