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Designing for Well-being: A Studio-Based Research Project on Producing an Educational Film for Women's Health

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Abstract



This study examined the absence of culturally appropriate films for maternal health education in Ghana, where maternal mortality remains a critical concern. Grounded in semiotics and the Persuasive Health Message (PHM) framework, this research employs studio-based and qualitative methods to develop a culturally relevant educational film. During pre-production, consultations with health officers and pregnant women helped define educational objectives, identify audience needs and preferences, and determine suitable styles and formats. Feedback was systematically integrated throughout the production to refine the film's form and content. The final film, which blends fictional and non-fictional elements, aligns with the instructional approach commonly used in pregnancy schools. The final film's syntagmatic structure conveys themes of threat, severity, susceptibility, efficacy, barriers, and rewards, while paradigmatic elements include relatable characters, colour schemes, lighting, sound effects, and compositing techniques that enhance cultural relevance and emotional engagement. The study concludes that the film serves as an educational resource on maternal education for maternal health officers in Ghana. Future research should assess its impact on knowledge acquisition, perceptions, and health

behaviours among the target audience. This study gives insight and extends knowledge on the significance of integrating semiotics and PHM in film production practices for film-based health education production in Ghana.

Keywords: Educational film, semiotics, culturally relevant, persuasive health message (PHM) framework, Ghana health education

1. Introduction

Films are a powerful communication tool. Its power stems from the integration of visual and auditory elements with narrative techniques to engage audiences both cognitively and emotionally (Brown, 2016; Millerson & Owens, 2008; Rosenthal & Eckhardt, 2015). The perceived communicative potential of film media continues to attract scholars across various disciplines including public health education and communication. For instance, Botchway et al. (2017) assert that “films might be an untapped resource for reaching people at an emotional and cultural level and serve as a medium for advancing health literacy” (p. 260).

Recent studies support Botchway et al.’s perspective on the role of films in health education, demonstrating their ability to enhance self-efficacy and motivate individuals to comply with health directives (Dagenais et al. 2021; Vetter et al. 2021). Similarly, Ampofo et al. (2024) and Drokow et al. (2021) reported that films encourage Ghanaian women to undergo cervical cancer screenings. These findings indicate that integrating films into public health education initiatives can effectively enhance health literacy in Ghana. More importantly, films can contribute to achieving Sustainable Development Goal 3 (SDG 3): improving the health and well-being of Ghanaians by 2030.

The concepts of films, health education, and cultural relevance provide valuable theoretical frameworks for advancing public health education. Films, defined as sequences of images and sounds that convey narratives (Rosenthal & Eckhardt, 2016), facilitate communication and expression by immersing viewers into unfamiliar concepts, locations, and lifestyles (Bordwell et al., 2016). Public health education seeks to change behaviours and improve health outcomes through structured educational activities (Glanz et al. 2008). Within media production, cultural relevance refers to the alignment of form and content with an audience’s cultural background (Afshari et al., 2024; Brooks et al., 2019; Kreuter & McClure, 2004). Based on these perspectives, this study defined culturally relevant film-based health education as audio-visual content tailored to the specific needs of a target audience to enhance learning and

comprehension. Consequently, producing culturally appropriate health films presents a valuable opportunity for developing nations, such as Ghana, as such materials can improve learning experiences and facilitate a deeper understanding of essential public health information.

Although film-based education has demonstrated effectiveness in public health education and communication, personal interactions and observations highlight the need for culturally appropriate educational resources for maternal health education officers in Ghana. Research by Sokey and Adisah-Atta (2017) supports this observation, noting that Ghana Health Service primarily employs radio, in-person communication, and printed materials for health education. Although these strategies are beneficial, they often fail to engage a broader audience, particularly individuals with limited literacy skills. Furthermore, recent studies indicate that health officers increasingly use social media platforms such as YouTube to source educational films for pregnancy school sessions (Nyarko & Yorke, 2024). However, this practice poses challenges, as these platforms often feature low-quality, non-targeted content that may fail to meet the cultural and educational needs of diverse audiences, including pregnant Ghanaian women (Griffith et al., 2024). Additionally, such sources may disseminate misinformation, potentially undermining the efforts of health officers (Osman et al., 2022). Additionally, the researcher's observations during various pregnancy school sessions and personal interactions indicate that health officers generally lack films for health education.

The lack of culturally relevant educational films on maternal health presents a significant barrier to inclusive and accessible health information that is essential for improving maternal health literacy. Addressing this gap is key to ensuring that pregnant women in Ghana receive accurate and culturally appropriate information. This study aimed to produce culturally relevant films as educational aids to support maternal health education.

The current state of maternal and child well-being in Ghana underscores the urgent need for the development and dissemination of culturally appropriate educational films to support maternal health education and ensure inclusivity and accessibility. According to the United Nations International Children's Emergency Fund (UNICEF, 2023), Ghana's maternal mortality rate was 263 per 100,000 live births. Although this represents a significant decline over the past two decades, the rate remains substantially higher than the World Health Organisation (WHO) and UNICEF targets of 70 per 100,000 live births by 2030. Additionally, the infant mortality rate is 22.8 per 1,000 live births, meaning that approximately 288 of every 1,000 infants do not survive (Poulin et al., 2024; Tenkorang-Twum, Atibila, & Gyapong, 2024). These statistics fall short of the Sustainable

Development Goals (SDGs), which aim to reduce the maternal mortality ratio (MMR) to below 70 per 100,000 live births by 2030 (Tenkorang-Twum et al., 2024).

To address this maternal mortality crisis, the Ghana Health Service has prioritised effective prenatal and antenatal education as a key intervention to reduce infant and maternal mortality rates (Ghana News Agency, 2023; Graphic Online, 2017). Furthermore, recent studies advocate intensified and innovative strategies to improve maternal health literacy among Ghanaian women (Ameyaw et al., 2021; Duodu et al., 2022; Tamma et al., 2023). Given these challenges, it is reasonable to conclude that integrating films into antenatal and postnatal education could serve as a valuable tool for enhancing maternal health literacy and ultimately improving maternal health outcomes in Ghana. These pressing issues informed the present study's objective of developing culturally relevant films as resources for maternal health education in Ghana.

To achieve this study's aim, the following section examines the theoretical framework, explores the literature on film as a medium of communication and engagement, and highlights the significance of culturally relevant films in health education.

2. Theoretical Framework and Literature Review

2.1 Theoretical Framework

This study combines semiotic theory and the Persuasive Health Message Framework (PHMF) as a theoretical framework to guide research. Combining these theories has served as a formative lens for exploring the production of film-based health education as an aid for maternal health education. These theories are suitable because the study focused on gathering health information to inform the creation of educational films that are culturally appropriate and cognitively effective aids for maternal health education.

2.1.1 Semiotic Theory

The semiotic theory is a branch of psychology that examines how signs function in communication. Its development was pioneered by Ferdinand de Saussure (1857–1913) and Charles Sanders Peirce (1839–1914) (Chandler, 2007). In the context of film production, semiotic theory provides a valuable framework for selecting and organising signs (communication elements) to create compelling narratives. This study specifically draws on semiotic codes and syntagmatic and paradigmatic sign relations to inform the filmmaking process.

Effective communication relies on codes, that provide a conventional system for conveying meaning (Rose, 2016, p. 150). By contrast, syntagmatic and paradigmatic

relations describe how meanings are generated through the relationships between signs (Danesi, 2004, p. 4). Syntagmatic relations refer to the sequential arrangement of signs that creates meaning through contextual placement. Conversely, paradigmatic relations focus on the selection of signs (images, words, or sounds), emphasising how meaning is constructed through choice, rather than sequence (Rose, 2016). Chandler (2007) further argues that syntagmatic and paradigmatic relations “provide a structural context within which signs make sense” (p. 84). In the context of film, meaning is constructed through the arrangement of shots (syntagmatic relations) and the specific selection of shots, in contrast to alternative options (paradigmatic relations).

This study adopted syntagmatic and paradigmatic relations as formative frameworks to anchor the film production process. Codes serve as a cultural framework for structuring maternal nutrition messages, guiding narrative content, and communication elements to ensure the film’s cultural relevance. Syntagmatic relations inform the sequencing of shots and other communication elements, thereby ensuring a logical and coherent narrative. Meanwhile, the paradigmatic framework guides the selection of characters, lighting styles, colours, props, and visual compositing techniques, fostering emotionally engaging visuals that enhance health education content and persuade the target audience to respond to the film’s message

2.1.2 Persuasive Health Message (PHM) Framework

The Persuasive Health Message framework developed by Witte et al. (1993), the Persuasive Health Message (PHM) guides the creation of educational health messages. The PHM framework identifies the transient and constant elements that shape the content of health education messages. Transient factors include message goals, cultural influences, and environmental context, whereas constant factors include threat and severity (the use of reasonable fear), susceptibility (audience risk perception), efficacy factors (knowledge and skills to avoid danger), and cue factors (cultural elements that facilitate response). Several studies have employed PHM to develop and structure health messages for safety and women’s health education (Hall & Johnson-Turbes, 2015; Wallington et al., 2018; Witte et al., 1993). This study adopts PHM as a formative framework to guide the collection and structuring of key content elements, including threats, severity, susceptibility, efficacy factors, and benefits. By applying PHM, the study ensures that the film’s message is theoretically sound and grounded in health behaviour and education principles.

2.2 Literature Review

2.2.1 Film Language, Techniques and Audience Engagement

Film media functions as a language system that shapes emotions and perceptions (Danesi, 2004). Filmmakers strategically combine visual and auditory elements to evoke emotions and reinforce meanings. For instance, lighting influences dramatic responses beyond its functional role in providing visibility; it also establishes mood, conveys time, and directs attention to critical areas within a scene (Castro-Alonso et al., 2021; Cutting & Armstrong, 2016). When combined with cinematography, lighting highlights character actions, enabling audiences to interpret motives and emotions (Bordwell et al., 2016). Camera angles further shape audiences' perceptions. High-angle shots diminish a character's prominence, suggesting vulnerability, whereas low-angle shots enhance it, implying power and authority. Similarly, shot size influences emotional engagement by controlling spatial relationships and proximity (Thompson & Bowen 2009). Long shots create detachment, allowing viewers to study characters within their surroundings, whereas medium and close-up shots foster closeness, exposing characters' psychological states (Bordwell et al., 2016). These visual elements establish the film form as an effective tool for engaging audiences and prompting positive responses to health education messages.

Sound and editing techniques complement cinematic elements by using visual cues to shape emotions and perceptions. Editing, a post-production process, involves the selection and arrangement of shots and sounds to construct a coherent narrative and to enhance audience comprehension (Thompson & Bowen, 2009). Continuity editing fosters a seamless and immersive viewing experience, while discontinuity editing introduces tension and suspension (Kovarski et al., 2022). Although sound is not a visual element, it is intricately linked to the visual edit and can be independently manipulated to create an immersive experience, often without conscious awareness (Bordwell et al., 2016, p. 264). For instance, sound design bridges auditory and visual elements, directing attention to key narrative points and facilitating cognitive processing (Knight-Hill, 2019). Furthermore, music and sound affect prime audiences, intensify emotional connections, and heighten narrative engagement (Fahlenbrach 2008; Meinel & Bullerjahn 2022). The interplay between auditory and visual editing significantly influences audience perception and is fundamental for effective storytelling and engagement. This synergy establishes audiovisual media as superior to other modes of communication (Oakley et al., 2021).

2.2.2 The Importance of Culturally Relevant Films for Public Education

Several studies have examined the relationship between culturally appropriate films and effective health education and communication. These studies highlight the significance of culturally relevant instructional videos in enhancing learning, retention, and health literacy, while addressing inequities across diverse cultural contexts. For instance, Maharjan et al. (2022) found that culturally specific films in Nepal significantly improved health literacy among pregnant women, leading to better postnatal care. Similarly, Sunni et al. (2023) and Harris (2018) established that culturally tailored videos effectively educate immigrant populations on health-related issues such as diabetes. Sunni et al. reported that diabetes-focused films designed for Somali immigrants enhanced comprehension, retention, and engagement, whereas Harris (2018) observed that culturally attuned videos reduced health disparities and improved self-efficacy among refugees. Beyond health education, culturally relevant films promote empathy and social justice in the educational setting. Cromarty et al. (2022) emphasised that such films foster cultural understanding, challenge preconceptions, and encourage appreciation of diversity. Cromarty et al. also stressed that culturally focused media must be strategically designed to cultivate authentic cultural awareness. These findings collectively suggest that a deliberate and methodical approach to culturally relevant educational film production is essential for maximising the impact of public education initiatives.

3. Methods and Production Processes

This study employed a studio-based research design combined with qualitative methods. Studio-based research, as explained by Earnshaw et al. (2015) and Marshall (2010), involves the application of artistic methods and techniques to create and interpret works as embodiments of knowledge. In contrast, Creswell (2013) defines qualitative research as an approach that captures “multiple realities” and the subjective experiences of individuals via an interpretive and naturalistic approach to provide deeper insights into the research problem (p. 44). The integration of studio-based research and qualitative methods established a robust framework for collecting participants’ diverse perspectives and guiding an iterative process of inquiry involving creative action and critical reflection (Sullivan, 2006, p. 28).

3.1 Field Research and Study Location

Field research was conducted in the Ga South Municipal Assembly (GSMA), located in the western part of the Greater Accra Region. Two factors influenced the selection of the GSMA. First, there is a recognised need for instructional films to support maternal health education (Sokey, 2016). Second, GSMA encompasses urban, peri-urban, and

rural health facilities, allowing for a diverse range of perspectives on maternal health information needs (Ghana Statistical Service, 2014). To ensure data diversity, this study selected five (5) public health institutions using maximum variation sampling: Aplaku Health Centre, Kokrobite Polyclinic, Mallam Demonstration Clinic, and Ga South Municipal Hospital. These facilities provided qualitative data that reflected multiple perspectives (Creswell, 2013, p. 157) throughout the study. Studio-based research was conducted at the National Film and Television Institute (NAFTI) in Cantonments, Accra, Ghana. Fieldwork and studio research were conducted between October 2018 and January 2020.

3.2 Participant Selection and Sampling Approach

Purposive sampling was employed to select health officers and pregnant women as participants. Specifically, twelve (12) health officers were selected during the pre-production stage using a stakeholder sampling technique, because of their role as “major stakeholders” directly involved in educating pregnant women (Given, 2008, p. 697). Additionally, seven (7) pregnant women participated in the pre-production phase through convenience sampling. During the production and post-production phases, seven (7) senior health officers participated in content validation and feedback sessions. In total, twenty-six (26) participants were involved in the study.

3.3 Data Collection and Analysis

This study used data from two primary sources. Qualitative data were collected through interviews and observations. Semi-structured interview protocols were designed to ensure consistency and flexibility, allowing participants to openly contribute to narrative structure, clarity, and persuasive techniques. The second dataset was derived from studio practice, employing studio research methods such as drawing, concept development, scriptwriting, storyboarding, filming, visual compositing, editing, and reflective practices based on the aesthetic action research cycle developed by Marshall (2010). Thematic analysis was used to analyse the qualitative data. To ensure validity and credibility, the study subjected the data to review by health officers to mitigate potential researcher bias. Triangulation was achieved by comparing the interview data with observational and reflective notes.

3.4 Ethical Considerations

The study adhered to ethical research standards. Approval was first obtained from the Ghana Health Service (GHS) National Headquarters, followed by regional approval from the Greater Accra Regional Health Directorate, and subsequently from the Ga South Municipal Health Directorate (GSMHD). All necessary approvals were forwarded to the heads of the selected health facilities within the Ga South Municipal Assembly to

facilitate access to study sites. Before conducting the study, the research purpose was clearly explained to the heads of the health facilities and units, and informed consent was obtained from all participants.

3.5 Equipment, Software Used and Crew

The equipment and tools used for the studio research included a computer, Wacom tablet, Canon Mark II DSLR camera, tripods, microphones, sets, props, costumes, and makeup. The film was shot at the National Film and Television Institute Studio 2. The software applications included Photoshop, After Effects, Adobe Premier Pro, and Audition, which were used to refine and edit audio. Three crew members supported the production: three (3) cinematographers, one (1) sound recorder, and one (1) production assistant.

3.6 Production Process

The film production techniques used in the production process were structured into four stages: content and message development, pre-production, production, and post-production. Marshal's (2010) aesthetic action research cycle was incorporated in each stage to ensure a rigorous studio-based research process. This cycle includes planning, creating, observing, and refining. Figure 1 shows the adopted production framework (the Edu-Film Production Research Model). The following sections provide a step-by-step description of the studio research exploration.

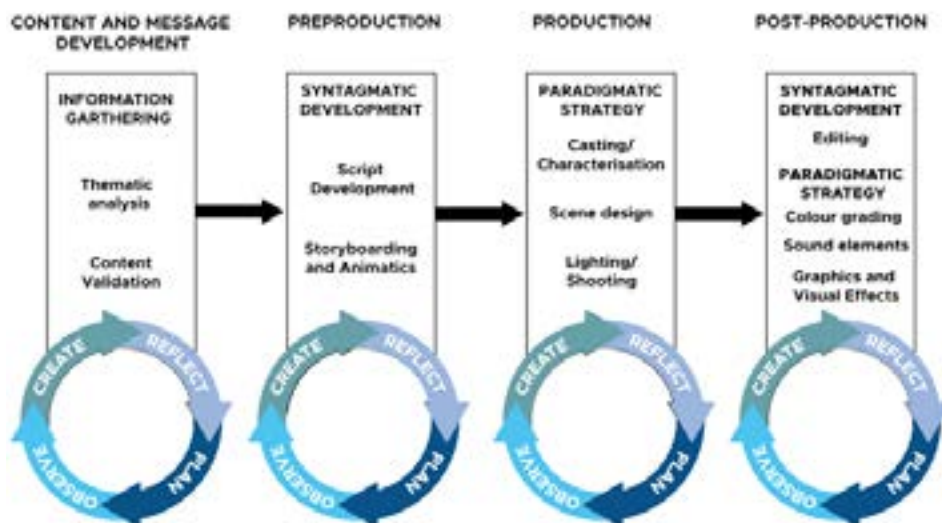


Figure 1 . Edu-film production research model based on Marshal's (2010) aesthetic action research cycle (Source: Author's studio work 2020)

3.6.1 Content Generation and Concept Development

The primary focus of this phase was to identify the need for educational films and to determine the informational content required to guide their development. To achieve this, interviews and discussions were conducted with participants to ascertain their primary needs, message goals, and content expectations for the film. To structure the message, the Persuasive Health Message (PHM) framework was employed to guide the selection of key message elements, including threat, severity, susceptibility, efficacy, and cue factors. These components highlight the dangers of health conditions and generate an appropriate level of concern for prompt action. Additionally, efficacy elements inform audiences of how to mitigate risks and encourage behavioural change. Barriers to compliance have also been addressed to enhance audience motivation (Hall & Johnson-Turbes, 2015; Witte et al., 1993). Table 1 summarises the project's focus, goals, and informational needs. To ensure accuracy and reliability, senior health officers reviewed and validated the content and messaging.

Table 1. Summary of data gathered from health officers and pregnant women, which informed the film's content

Content elements	Focus
Project focus	Prenatal Nutrition (Four star diet) The film must explain four-star diet
Message goals	Film should communicate the importance of good prenatal nutrition in simple audiovisual form.
Recommended actions	Avoid Iron Inhibitors e.g., energy drinks, coffee, tea. Non-nutritive substances such as "ayilo" or "shere" (Dried clay) Use mosquito nets to prevent malaria Eat more Fruits and drink more water Iron supplements Impotence of antennal clinics

Persuasive elements	Threat:
	Poor prenatal nutrition can lead to anemia,
	Severity
	Birth complication, Death of both mother and baby
	Baby deformities
	Susceptibility
	Every pregnant woman
	Efficacy skills
	Eat four start diet
	Mosquito nets to prevent malaria
Format and style and language	Attend antenatal clinics consistently
	Use the pregnancy school format.
	Friendly
	Twi Ga, Ewe and Hausa
Possible barriers to the recommended action	Economic Issues
	Food taboos
	Vomiting
	Some religious beliefs
Possible channels of dissemination	Pregnancy schools
	Counselling sessions
	WhatsApp

3.6.2 Preproduction: Syntagmatic Structuring

Pre-production involves the development of ideas and concepts to inform scriptwriting and narrative structures (Musburger & Kindem, 2009). In this stage, the study focused on two key objectives. First, it aimed to define the film's style and develop a script that would ensure that the syntagmatic structure was effectively integrated with paradigmatic elements, thereby enhancing narrative relevance and communication effectiveness (Danesi, 2004). Second, health officers were extensively engaged in idea

generation, contributing to the development of a structured approach aligned with existing pregnancy school methodologies, in which health officers educate through discussions and demonstrations (Addai-Mensah et al., 2018). As illustrated in Figure 2, the narrative structure followed a clear three-act progression: beginning, middle, and end. The educational message begins with an introduction, followed by content addressing threats, severity, and susceptibility. The middle section focuses on efficacy, cue factors, and barriers to an efficacy response. The story concludes by highlighting the rewards and benefits of adopting the recommended health behaviours.



Figure 2. Syntagmatic structure showing the beginning, middle and end of the narrative (Source: Author's studio work 2020)

Storyboards and animatics were developed to visualise the syntagmatic structure, which health officers subsequently reviewed (See Figure 3). This pre-visualisation technique enabled health officers to observe a draft version of the potential narrative structure of the final film. The narrative flow was refined based on the participants' feedback and concerns. To avoid extraneous information, unnecessary elements are excluded while structuring narration comprehensibly and naturally, as stipulated by the coherence principles of the Cognitive Theory of Multimedia Learning (Mayer, 2024).

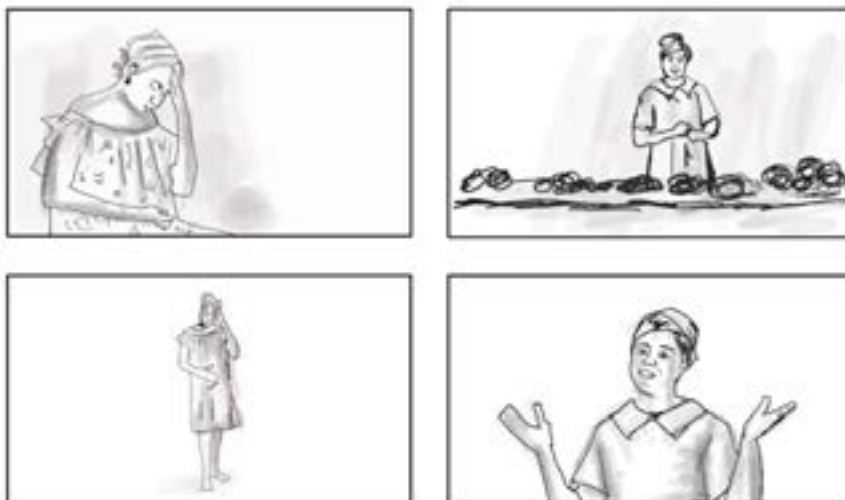


Figure 3. Selected shots from the storyboard. (Source: Author's studio work 2020)

3.6.3 Selecting Paradigmatic Signs

Characters and symbols are carefully selected to establish an emotional connection with the audience through strategic communication elements. Based on this concept, a midwife was chosen as the narrator because midwives are trusted sources of maternal health information. The narration was delivered in Twi, the predominant language used by both health officers and pregnant women in antenatal clinics (Lawrence et al., 2022). Additionally, a middle-aged woman was cast to portray a pregnant woman, ensuring reliability across various demographic groups (Lee & Stevens, 2022). Props and objects were selected to reflect the Ghanaian context and reinforce cultural authenticity and relevance. The set design incorporates specific colour schemes with a simple, flat background, ensuring visual coherence in alignment with the multimedia learning principles (Mayer, 2024).

This phase also involved selecting colour schemes and lighting to enhance visual engagement and to facilitate the film's use as an educational resource. Two lighting techniques were used in this study. First, high-key lighting was used for general visibility and to illuminate the narrator (the midwife). This technique has also been applied to efficacy scenes to evoke a sense of happiness and positivity. Low-key lighting helps create dramatic shadows to depict threat, severity, and susceptibility, thereby evoking fear and reinforcing the importance of preventive actions.

To ensure optimal compositing control during post-production, a green screen technique was used to capture both characteristics (see Figure 4). This method allowed background manipulation, enabling the researcher to integrate additional visual messages that enhanced the film's educational impact.



Figure 4. Lighting and set design for the production (Source: Author's studio work 2020)

3.6.4 Production

Production involves composing and framing characters and scene elements to create coherent visual narratives (Bordwell et al., 2016; Musburger & Kindem, 2009). From a semiotic perspective, this stage focused on giving form to both syntagmatic and paradigmatic concepts (Danesi, 2004). To structure character movements in relation to camera positions, the researcher employed blocking techniques during rehearsals and filming. A prompter displaying an outline of the message facilitated the flow of the dialogue, ensuring clarity and consistency. The scenes were filmed in segments, allowing midwives to express themselves naturally, thereby minimising on-camera anxiety. A multicamera setup was employed, as illustrated in Figures 5 and 6. A Canon Mark II 5D DSLR with a 35 mm focal length served as the master camera for wide-angle shots, whereas two additional cameras captured close-ups from various angles. This approach reduced filming anxiety by minimising retakes, allowing for the simultaneous capture of master shots and inserts, eliminating frequent camera repositioning, and ensuring a dynamic and engaging final film. Close-ups were strategically employed to draw the audience closer and emphasise key points, ensuring strict adherence to the syntagmatic structure of the film

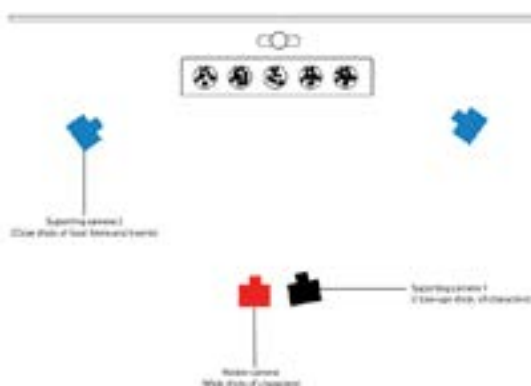


Figure 5. Multi-camera position for filming (Source: Author's studio work 2020)



Figure 6. Rehearsal and filming based on the multi-camera position

(Source: Author's studio work 2020)

3.6.5 Post-production

This phase involved the logical organisation of all footage, including dialogue and music, to enhance the narrative's message and emotional impact (Kovarski et al., 2022). Montage editing was used to create a cohesive narrative from the shot and audio components (Bordwell et al., 2016), generating meaning through syntagmatic associations between consecutive shots (Danesi, 2004). Before editing, each shot was evaluated for size, angle, and message. The editing process comprised three stages: assembly, rough cutting, and final cutting. The assembly stage created the story's basic structure according to the script, arranging selected shots on a timeline. During rough cutting, narration and sound effects were synchronised with the actions per the script's syntagmatic structure. In the final cut stage, each shot and sound element was refined for synchronisation with actions. Following the multimedia principle of Mayer (2024), illustrations, animations, and sound effects were added to enhance the communication. After multiple review and refinement stages, the video was compressed using an Adobe Media Encoder (H.264 codec) and distributed via USB sticks and WhatsApp for post-production feedback.

4. Results and Discussion

This study addresses the deficiency of culturally relevant films for maternal health education. This section discusses studio-based research results, focusing on the film's descriptions and emerging semiotic forms.

4.1 Description of the Film

The study produced a 10-minute, 9-second educational film, a hybrid of fictional and nonfictional elements. The film begins with a montage of food items, medicines, and a happy pregnant woman, showing the recommended practices for safe pregnancy care. The film transitions from black to a close-up of a midwife who introduces herself as "Auntie Midwife" and discusses the severe effects of poor nutrition on both mother and baby, accompanied by images of a distressed pregnant woman. The midwife provides practical advice on proper nutrition, such as taking prescribed medicines, attending clinics, sleeping under mosquito nets, and drinking sufficient water, while advising against iron inhibitors, such as carbonated and caffeinated drinks and "shere", a locally dried clay. The visuals depict a pregnant woman following these recommendations. In the final scenes, the midwife addresses barriers such as vomiting and nausea that prevent adherence to these practices and highlights the benefits of good nutrition, including folic acid intake and attending antenatal clinics, as illustrated by images of happy pregnant women. The film concludes with an animation of a four-star logo and a happy, healthy, pregnant woman. [A copy of the film can be viewed using this link.](#)

4.2 Syntagmatic and Paradigmatic Elements

Similar to other media, films select and structure signs using specific codes shared by producers and audiences. In film, characters, dialogue, costumes, colour and lighting, sound, and cinematography are signs, but are not assembled randomly. Through cinematic conventions, these visual elements are framed into complex signifiers that convey meaning. In line with Chandler's (2007) view, the final film becomes a "text" with semiotic functions. Chandler further explained semiotic functions of text as

Every text is a system of signs organised according to codes and subcodes which reflect certain values, attitudes, beliefs, assumptions, and practices. Codes transcend single texts, linking them together in an interpretive framework which is used by their producers and interpreters...In creating texts we select and combine signs in relation to the codes with which we are familiar. Codes help to simplify phenomena to make it easier to communicate experiences. In reading texts, we interpret signs with reference to what seems to be appropriate codes. This helps to limit their possible meanings. Usually, appropriate codes are obvious and overdetermined by all types of contextual cues. The medium employed clearly influences the choice of the code (p.157)

Drawing from Chandler's perspective, the film produced from this study constitutes a "text": a product of deliberate selection and structuring of visual and auditory signs according to codes that express the values and beliefs of safe maternal practices from public health perspectives, as well as cinematic and communication techniques. As an educational film, it is intended to evoke meanings and guide the interpretation of pregnant women to align with the intended message from health officers regarding safe maternal nutrition practices. This was achieved through the film's codes and the syntagmatic and paradigmatic systems.

Codes are the foundation of effective communication as they provide a "set of conventionalised ways of making meaning' (Rose, 2016, p. 150). They govern the selection of signs and establish the rules that should be adhered to in constructing communication messages to "reinforce the thematic discourse of a film." (Yahaya & Abubakar, 2018, p. 37) In this study, specific codes were used to frame both content and form. For example, the film employs low-key lighting and dark colours to depict scenes of fear and threat, whereas high-key lighting with bright colours symbolises the rewards and happiness of following the solution. Collectively, this approach projects a cultural code that highlights the nexus between fear, womanhood, and pregnancy in the Ghanaian context, which, in many instances, motivates pregnant women to take all actions during their pregnancy (Ansong et al., 2022; Aziato et al., 2016). Thus, the narrative and visual codes approaches are a communication attempt to "guide interpretation"

(Danesi, 2004, p. 21). This ensured that the expectant audience's interpretations of the narratives aligned with the intended message of the educational film.

Syntagmatic sign relations generate meaning from spatial relationships among groups of signs within specific code frames (Danesi, 2004; Rose, 2016). In films, this meaning is derived from a sequence of shots. Chandler (2007) identified this process as "intratextual to other signifiers co-present within the text" (p. 84), implying that meaning is created from the sequence of signs. Thus, audience interpretation of films is influenced by the structure of individual shots and the methods used to link them.

Drawing on the syntagmatic sign concept, this study structured the educational messages of this film into a coherent narrative, ordered scenes, visual and textual flows, sound, and temporal sequence. For example, the scenes were divided into beginning, middle, and end. The beginning used a threat-persuasive approach, with the midwife highlighting the risks of poor nutrition and unsafe practices. The middle scene provides efficacy skills and solutions, showing a pregnant woman consuming nutritious food and taking medication. She also performed an action to address efficacy barriers (See Figure 7). The final scene illustrates the rewards of following recommended actions, with motivational narration, and a happy pregnant woman performing these actions, ending the scenes with her looking at the audience happily. Visual and textual elements were organised for clarity using the gestalt principles of proximity and continuity. Appropriate transitions, such as cuts for spontaneous actions and fades for the passage of time, guided the audience through the narrative without confusion. The overall pacing of the transition between shots adheres to the slower editing approach. Visual continuity is maintained throughout the film through cuts, match cuts, and inserts, preserving the logical flow and coherence in the narrative. By sequencing scenes, visual and textual flow, sound, and temporal sequence, the study ensured that the film's message was logically and coherently structured to support effective communication as educational media.



Figure 7. Examples of self-efficacy, benefits, and barrier scenes are portrayed through high-key lighting to communicate happiness (Source: Author's studio work 2020)

While syntagmatic signs derive meaning through a combination of signs and spatial relationships, paradigmatic relations are based on the selection of signs, in contrast to other possible signs that are absent. As Rose (2016) explains, “paradigmatic signs gain their meaning from a contrast with all other possible signs” (p. 142) that could have been used within a communication text. Similarly, Chandler (2007) described paradigmatic meaning as “intertextually linked to signifiers that are absent from the text’ (p. 84). In essence, audiences construct meaning by comparing the signs within a given text with other potential but absent signs—or, in the case of film, by interpreting visual and narrative choices that are not explicitly shown within a sequence of shots or mise-en-scène. Consequently, shot selection and spatial relationships significantly influence audience interpretation (Yahaya & Abubakar, 2018).

Paradigmatic sign relations were instrumental in achieving cultural and emotional relevance. This was accomplished through relatable characters, culturally relevant colour schemes, lighting, sound effects, shot selection, and narration styles. For instance, the film strategically features two central characters: “Auntie Midwife” (a midwife officer) and a pregnant woman. The costumes and makeup were carefully designed to align with the cultural background of the target audience (see Figure 8). Additionally, colour, lighting, sound effects, and compositing techniques were employed to enhance emotional engagement, particularly in scenes depicting joy and distress (Figure 9). For example, an animated sequence illustrating the dangers of poor nutrition transitions into a low-light scene of a distressed woman, intercut with the imagery of a premature infant, followed by a black screen layered with siren sounds and a heartbeat, intensifying the fear of severe complications and death (see Figure 8). Conversely, high-key lighting with vibrant colours was used in positive scenes, providing a stark contrast to dark, low-key effects. Thus, through food imagery and culturally resonant language, the film’s form and content are designed to evoke strong emotional engagement.



Figure 8. The two characters in the film. (Source: Author's studio work 2020)



Figure 9. Examples of scenes with low-key lighting to elicit fear. (Source: Author's studio work 2020)

A key paradigmatic element of this film is the use of Twi for narration, a language commonly employed by health officers in antenatal education. Griffith et al. (2024) asserted that language plays a vital role as a culturally significant component, enhancing both audience attention and comprehension in health education materials. To ensure accessibility for hearing-impaired audiences, the narration was also interpreted in Ghanaian Sign Language. Beyond language, the film incorporated local nutritious food ingredients, including kontomire, ademe, bokoboko, plantain, cassava, beans, and groundnuts (Figure 9). Additional ingredients featured dried fish, meat, eggs, carrots, and garden eggs. Furthermore, the film depicted traditional Ghanaian dishes such as fufu with light soup, kontomire stew with yam, Tuo-Zaafi, and banku with okro soup, among other nutritious local meals. Through these paradigmatic sign choices, the film aimed to be logically structured, culturally sensitive, inclusive, and emotionally engaging, thereby ensuring its effectiveness in maternal health education.



Figure 10. Shots of the opening sequence of the educational film. (Source: Author's studio work 2020)

Existing literature strongly supports the film's efforts to project cultural relevance and achieve narrative coherence. By portraying culturally familiar characters, the film enhances source credibility, which is a key factor in effective health communication (Lee et al., 2024; Zarzeczna et al., 2024). For instance, Figure 8 illustrates a midwife, a qualified health professional, delivering essential maternal health information, while the pregnant woman demonstrates the risks and benefits of following the health recommendations. This approach aligns with the health education literature, as Kreuter and McClure

(2004) assert that expert sources are “more persuasive than those lacking expertise’ (p. 443). Additionally, relatable sources enhance persuasive impact as audiences are more receptive to the characters they identify with. Consequently, audiences are likely to perceive midwives as trustworthy, which increases their receptiveness to health messages. The inclusion of pregnant women further facilitates audience identification and reinforces self-efficacy in adopting recommended health practices. Moreover, several studies have highlighted the importance of narrative coherence in fostering cognitive and emotional engagement in educational films (Hinde et al., 2018; Mayer, 2024). This research supports the film’s structured narrative, ensuring that it effectively communicates maternal health education messages in a culturally resonant and impactful manner.

5. Conclusion

This study addressed the absence of culturally relevant educational films on maternal health in Ghana, where maternal and child mortality rates remain a critical concern. It developed a culturally appropriate educational film informed by the contributions of health officers and pregnant women, whose insights shaped both its content and structure. The study concludes that the final film serves as a culturally tailored maternal health resource, designed to engage the target audience both emotionally and cognitively, while functioning as an instructional aid for health officers. This is demonstrated through the application of the Persuasive Health Message (PHM) framework, which guided the identification of informational needs, and semiotic theory, specifically syntagmatic and paradigmatic sign relations, which provided a framework for selecting and organising culturally appropriate communication elements into a coherent film form. These elements are expected to enhance audience engagement and support maternal nutritional education in Ghana. Despite these findings, this study is not exhaustive. It encourages further enquiry into its conclusions through theoretical, methodological, and contextual perspectives. Future research should assess the film’s impact on knowledge acquisition, perception, and behavioural intention among pregnant women.

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