

Evaluating Film's Efficacy in Improving Individuals' Attitudes and Knowledge About Maternal Health in Sierra Leone

Brooke Erickson¹⁾, Constance Mulligan²⁾, MJ Le Vu³⁾,
Musa Santigie Kamara⁴⁾, Fathima Wakeel³⁾, Michael Kramp²⁾

¹⁾Department of Global Health, University of Washington, United States

²⁾College of Arts and Sciences, Lehigh University, United States

³⁾College of Health, Lehigh University, United States

⁴⁾Independent Community Health Worker (Unaffiliated), Sierra Leone

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ABSTRACT

Background: Sierra Leone's high maternal mortality rate is attributed to inadequate healthcare, low health literacy, and distrust in healthcare facilities. The Mothers of Sierra Leone team produces films to empower women, improve maternal health attitudes, and facilitate care-seeking behaviors. This study quantifies the efficacy of two educational films on Sierra Leonean mothers' and fathers' health-related knowledge and beliefs.

Subjects and Method: This pre- and post-survey study was conducted in Makeni and Freetown, Sierra Leone, with 76 participants recruited through convenience sampling - 19 mothers and 19 fathers in both film groups. Participants viewed films on either family planning or maternal mental health. The independent variables included the film subject, family planning, or maternal mental health, and the dependent variables involved changes in knowledge, attitudes, and behavior from pre- to post-intervention. Measurement instruments included surveys with questions on a Likert scale. Statistical analyses were performed in RStudio, using Wilcoxon Signed-Rank, Mann-Whitney, Fisher's exact, and Spearman's Rho tests to assess post-intervention changes and the efficacy of the films.

Results: Findings revealed a 20.8% increase in perceived understanding ($p = 0.02$), a 61.1% increase in willingness to seek family planning services ($p = 0.03$) in mothers, and a 20.9% increase in the likelihood of managing mental health ($p = 0.01$) in mothers. Fathers' willingness to be involved in their partners' healthcare increased by 53.4% ($p < 0.001$). The family planning film was better received than the mental health film ($U = 121.5$, $p = 0.03$). Gender differences were observed, with fathers more inclined ($p < 0.001$) to address their mental health compared to mothers.

Conclusion: Leveraging film as an educational tool to amplify community members' stories can enhance health literacy, improve attitudes and behaviors, and support maternal health outcomes.

Keywords: maternal health, quantitative survey, intervention, film efficacy, health education.

Correspondence:

Brooke Erickson. University of Washington. 1410 NE Campus Pkwy, Seattle, WA 98195. ble23@uw.edu

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BACKGROUND

Maternal mortality remains a pressing global health issue. Notably, about 95% of maternal deaths occur in low- and middle-income countries (World Health Organization, 2024). Efforts such as the Free Health Care Initiative and the Sierra Leone National Reproductive, Maternal, Neonatal, Child and Adolescent Health Strategy have made strides toward reducing the high maternal mortality rate alongside organizations such as the United Nations International Children's Emergency Fund, the World Health Organization, and Partners in Health. Despite this, the maternal mortality rate in Sierra Leone consistently ranks among the highest internationally, with 443 pregnancy-related deaths per 100,000 live births as of 2020 (WHO et al., 2023).

Polarized politics, brain drain, fragmentation of the healthcare system, and infectious disease are some pressing challenges the nation is grappling with, particularly following the Sierra Leone Civil War. These crises coincide with detriments in the availability and utilization of maternal and child healthcare services (Shafiq et al., 2024b). Additionally, these events weaken the already vulnerable healthcare system, exacerbating structural issues such as inaccessible quality care and health education, a shortage of resources, understaffing, and poor infrastructure (Shafiq et al., 2024a; WHO et al., 2023). Individual perceptions and practices, such as limited awareness of pregnancy-related warning signs, a lack of trust in the healthcare system, poor health-seeking behaviors, and the norm of at-home births, further exacerbate the maternal mortality rate (Treacy and Sagbakken, 2015; WHO, 2024, p. 202, 2023). Nevertheless, most maternal deaths are preventable (Shafiq et al., 2024a; WHO, 2024, 2023). By prioritizing innovative

solutions and multisectoral collaborations, diverse and interdisciplinary initiatives can make strides toward reducing the high maternal mortality rate in Sierra Leone.

To understand how to combat the high maternal mortality rate, health and related behaviors must be examined at a community level (Mweemba et al., 2021). A study found that one in seven Sierra Leonean interview participants had a close relative pass away by 23.5 years of age due to pregnancy-related causes. The leading causes of death recorded in urban areas were bleeding, "no clinic," and "the will of God." Participants from rural areas, conversely, cited teenage pregnancy and anemia. These interview responses align with data from 2016 and 2019, reflecting hemorrhage, hypertensive disorders, and sepsis as the most rampant contributors to maternal deaths (Shafiq et al., 2024a). Solutions for the high maternal mortality rate in Sierra Leone must cater to both urban and rural populations, each with distinct needs.

Educational films effectively promote maternal and newborn health outcomes by addressing belief systems (Maharjan et al., 2022; Mweemba et al., 2021). Films shown through focus groups and interviews in Zambia and Nepal increased knowledge about maternal and child health topics, including nutrition, antenatal care, and parental involvement. After watching films in Zambia, study participants revealed improved knowledge and comprehension, particularly regarding the importance of male involvement throughout pregnancy and seeking antenatal, perinatal, and postnatal services. Data from Nepal revealed increased knowledge of up to 420% on the correct timing of visits, breastfeeding after birth, and paternal support before and after pregnancy. Knowledge enhances cognitive and decision-making abilities, increasing

health maintenance behaviors (Peters et al., 2010). Films are also an efficient medium for addressing global health challenges as they are digestible for communities with low health literacy rates. These immediate improvements in understanding exhibited in other low- and middle-income countries inspire our further exploration of film's efficacy on maternal health attitudes and behaviors, specifically on family planning and mental health, in Sierra Leone.

It is critical to consider family planning in Sierra Leone as 86% of girls aged 15 to 19 years old have not used contraceptives, with this same age range representing the majority of teenage pregnancies (Peters et al., 2010; United Nations Fund for Population Activities [UNFPA], 2017). This lack of utilization of resources, like contraceptives, contributes to the reported 31% unmet family planning needs and 28% teenage pregnancy rate (UNFPA, 2017). Although an updated statistic from more recent data is necessary, 40% of the maternal mortality rate was attributed to teenage pregnancy in the year 2020 (Nuwabaine et al., 2023). Therefore, it is crucial to raise awareness of the respective family planning resources available in the local communities of Sierra Leone.

Mental health must also be discussed in conjunction with maternal mortality, as made evident by a report from the Centers for Disease Control and Prevention on pregnancy-related deaths in the United States from 2017 to 2019. Mental health was proven to account for 23% of maternal deaths in this industrialized nation, making it the leading cause of mortality (Centers for Disease Control and Prevention (CDC), 2024). This statistic depicts the need for accurate data on Sierra Leonean mothers' mental health to investigate the contributions that poor well-being may have on

maternal outcomes. Relevantly, outlooks on mental health in Sierra Leone have been shaped by the Lunacy Act of 1902, such as labeling those with mental illness as criminals, perpetuating stigma, and further foregrounding the need for conversations, education, and prioritization on mental health (Hann et al., 2015; Harris et al., 2020). Optimal holistic health, particularly that of mothers given their vulnerability before, during, and after pregnancy, is met through addressing both mental and physical domains of well-being.

Mothers of Sierra Leone posits that short documentary films amplifying community members' stories and voices are a successful, innovative approach to preventing maternal deaths. This initiative creates films highlighting interviews with Sierra Leonean mothers, fathers, and healthcare workers to promote health education, health-seeking behaviors, and trust in the healthcare system. This study expands upon the project's previous qualitative research by administering surveys in non-clinical settings to quantify the efficacy of two films, "Family Planning at Kunsho Clinic (2022)" and "Normalizing Mental Health in Sierra Leone," in improving Sierra Leonean mothers' and fathers' maternal health-related attitudes and behavior. The family planning film exhibits an interview with a nurse to spread education on family planning, demonstrate available resources, and reiterate healthcare workers' respect for patient confidentiality. The mental health film defined mental health, discussed maternal depression, and methods to manage mental health and maintain well-being.

SUBJECTS AND METHOD

1. Study Design

Data were collected from study participants in Makeni and Freetown, Sierra Leone, who

watched one of two films on family planning or maternal mental health. Films addressing maternal health-related challenges were screened with support from the Child Health and Mortality Prevention Surveillance (CHAMPS) organization, trusted community partners, healthcare facilities, and community members. Respondents completed pre- and post-intervention surveys that inquired about their knowledge and attitudes regarding either family planning or mental health, depending on the film they viewed.

2. Population and Sample

This study aims to understand the complex challenge of maternal mortality in Sierra Leone. The sample population was composed of individuals near Makeni and Freetown, Sierra Leone. Participants were recruited through convenience sampling in non-clinical community settings, which differs from the team's previous research, in which focus groups were primarily administered in healthcare settings. This approach provides valuable insights by capturing the perceptions of participants with diverse backgrounds, levels of education, and lived experiences. The sample size of this study was 76 respondents, comprising two distinct samples of 19 mothers and 19 fathers.

3. Study Variables

Survey questions gauged participants' self-reported importance and understanding of the respective topic, confidence in their knowledge of the subject, and attention to content for both films. Distinguishably, the family planning film survey specifically asked mothers about their health-seeking behaviors and fathers about their likelihood of being involved in their partner's care. The survey for the mental health film uniquely asked participants about their willingness to manage their mental health.

4. Operational Definition of Variables

This study posits that the film subject, family planning or maternal mental health, is the independent variable. All respective changes in attitudes, behavior, and knowledge from pre- to post-intervention are the dependent variables. Specifically, the dependent variables include changes in the perceived importance of subjects (i.e., family planning or maternal mental health), knowledge of subjects, confidence in subjects, and likelihood to seek care regarding the subjects.

5. Study Instruments

All questions were formatted on a Likert scale of 1-5, and then translated into a scale of 0-4 for analysis.

6. Data analysis

Statistical analysis was completed in R Statistical Software (R Core Team, 2022). Wilcoxon Signed-Rank tests compared pre- and post-intervention responses among mothers and fathers for each film. Mann-Whitney tests evaluated differences in pre- and post-intervention data between mothers and fathers for both films. Fisher's exact tests measured changes in knowledge before and after viewing either film. Spearman's Rho tests assessed correlational relationships between variables.

7. Research Ethics

Ethics approval was obtained from the Lehigh University Institutional Review Board and the Sierra Leone Ethics and Scientific Review Committee Directorate of Training and Research.

RESULTS

1. Sample Characteristics

Data was collected from two samples of an equal number of fathers and mothers in Sierra Leone who watched one of two films on family planning or mental health (see Table 1).

Table 1. Sample characteristics (categorical data)

Characteristics	Category	Frequency (n)	Percentage (%)
Gender	Male	38	50.0
	Female	38	50.0
Film shows	Family Planning at Kunsho Clinic 2022	38	50.0
	Normalizing Mental Health in Sierra Leone	38	50.0

2. Bivariate Analysis

Family Planning Film

Mothers' perceived importance of family planning increased by 20.8% ($p = 0.02$), and their likelihood of visiting healthcare clinics increased by 61.1% ($p = 0.03$) after watching the family planning film (Figure 1). Mothers' understanding of the film was correlated with higher confidence in family planning

knowledge ($r = 0.76$, $p < 0.001$, Table 2). After watching the family planning film, fathers' willingness to be involved in their partners' healthcare increased by 53.4% ($p < 0.001$). Fathers' understanding of the film was positively correlated with their perceived importance of family planning ($r = 0.62$, $p = 0.005$, Table 2).

Table 2. Spearman's Rho Correlations Between Survey Variables

Film shown	Pre/Post-survey	Correlation variables	r	p
Family Planning at Kunsho Clinic 2022	Post-survey	Confidence in Knowledge of Family Planning x Understanding of the Film (Mothers)	0.76	0.001***
	Post-survey	Importance of Family Planning x Understanding of the film (Fathers)	0.62	0.005***
Normalizing Mental Health in Sierra Leone	Post-survey	Understanding of the Film x Importance of Mental Health (Mothers)	0.46	0.048*

Mental Health Film

Mothers' perceived importance of mental health increased by 12.6% ($p = 0.010$), and their likelihood of managing their mental health increased by 20.9% ($p = 0.010$) after watching the mental health film (Figure 1). Mothers' understanding of the film was positively correlated with their perceived importance of mental health ($r = 0.46$, $p =$

0.048, Table 2). Pre- and post-intervention surveys among mothers and fathers ($p = 0.020$ and 0.030 , respectively) revealed increases in knowledge of mental health. However, the likelihood of managing mental health was higher in fathers than mothers in pre- and post-intervention surveys ($p = 0.010$ and < 0.001 , respectively).

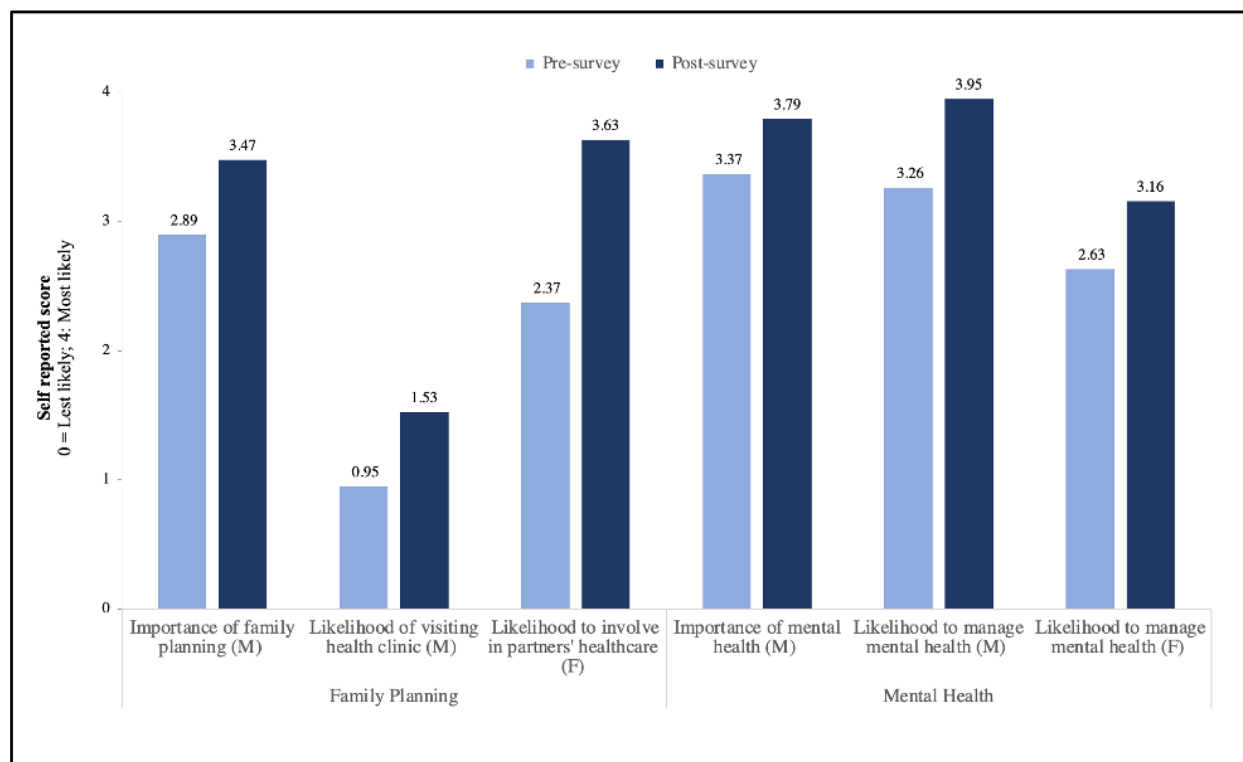


Figure 1. Selected mean scores for survey response

Comparison Between the Films

Although both films were effective, participants' understanding varied significantly. Specifically, comprehension of the family planning film was greater (Mann-Whitney $U = 121.5$, $p = 0.03$; data not shown). Mothers were also significantly more likely to seek help with family planning than with mental health (Mann-Whitney $U = 50.5$, $p = 0.0002$; data not shown).

DISCUSSION

This study builds upon previous literature to suggest film's efficacy for maternal health education and promotion by showing changes in respondents' perceptions and care-seeking behaviors (Maharjan et al., 2022; Mweemba et al., 2021). Understanding, confidence, and likelihood to seek care were all significantly interrelated, reiterating the importance of knowledge in promoting positive healthcare decisions (Peters et al., 2010). Comparing the mental

health and family planning film data demonstrates how individuals conceptualize their beliefs and practices on attaining optimal maternal health, both in mental and physical domains. Additionally, evaluating survey data across the two films is distinct since mental health is more taboo than family planning. Mental health challenges are considerably less acknowledged than physical health challenges, especially in low- and middle-income countries, however, there is an urgent need to normalize discussion on this topic (Hann et al., 2015; Harris et al., 2020).

Survey responses support this notion as lower confidence, understanding, and willingness to manage mental health were reported in comparison to seeking family planning services. These findings related to mental health data may be attributed to the lack of conversation on the topic and stigmatization that is deeply embedded in Sierra Leone, with only one instance being

the Lunacy Act of 1902 (Hann et al., 2015; Harris et al., 2020). Additionally, given the prevalence of patriarchal masculinity and widespread gender norms, men are often discouraged from prioritizing or even discussing their mental health (McLean, 2020). Nonetheless, mothers' responses interestingly suggest a significantly lower willingness to manage their mental health as compared to fathers. This highlights the need to encourage mothers to prioritize their well-being, particularly given the innate challenges of giving birth, entering motherhood, and the societal norms and pressure that coincide with this. Open conversations on mental health in community and health-care settings should be frequent to work towards eradicating stigma on this topic.

Correspondingly, previous focus groups conducted by Mothers of Sierra Leone reveal mothers' desire for increased paternal involvement throughout their pregnancy. Although patriarchal ideals are still rampant in Sierra Leone, motivating men to continue adopting roles that foster love and unity in families could improve paternal involvement, mental and physical health for both mothers and fathers, interpersonal relationships, and gender equity (McLean, 2020). This analysis suggests that filmic content can inspire fathers to have an active role in supporting their partner through pregnancy in "contextually and culturally gendered ways" (McLean, 2020). Altogether, the data reveal films are a captivating public health intervention with the potential for larger-scale implementation, particularly in low- and middle-income countries that are facing challenges such as, but not limited to, maternal mortality.

One limitation is the participants' lack of attention while viewing the film, potentially providing inaccurate data. To increase the study's validity, an attention-

check question was incorporated in the pre- and post-intervention surveys. Similarly, to maintain viewers' attention to the mental health film, only about six of the eight minutes were shown. This approach omitted some relevant details but still conveyed essential information on mental health and de-stigmatization. In terms of screening the films, Krio and Temne are predominant languages alongside English, notably requiring translation of the films when necessary. Additional limitations include a small sample size and a time-consuming process, largely dependent on our translator's administration of surveys. This should be considered when establishing similar global health initiatives to ensure their sustainability.

Short documentary films have proven as an efficient public health medium for promoting education, health outcomes, and inspiring behavioral change (Maharjan et al., 2022; Mweemba et al., 2021). To make these approaches more sustainable and impactful, films should be translated into the local languages of the specific community. Mothers of Sierra Leone aims to translate current films to expand outreach into rural communities. It is imperative to expand our reach to these regions, as geographical remoteness heightens the need for health education. Research shows that rural areas have lower health literacy compared to urban settings (Aljassim and Ostini, 2020). To continue investigating the efficacy of filmmaking on maternal health promotion, future research should replicate the use of filmic storytelling in other low- and middle-income nations experiencing persisting global health challenges, including maternal mortality. Longitudinal studies should also assess films' effectiveness in increasing service utilization and improving health outcomes over time.

Understanding community attitudes

can aid in developing appropriate public health interventions. Films that amplify community members' voices can positively impact health-related knowledge and beliefs among mothers and fathers, thereby contributing to a reduction in Sierra Leone's high maternal mortality rate. Both the mental health and family planning films inspired comprehension of health-related topics, confidence, and health-seeking or management behaviors. Mothers of Sierra Leone intends to translate films into local languages, disseminate films in rural Sierra Leonean communities, and shift film production to local community members.

AUTHOR CONTRIBUTION

BE: Conceptualization, Data Curation, Formal Analysis, Methodology, Visualization, Writing – Original Draft, Writing – Review and Editing; CM: Conceptualization, Writing – Original Draft, Writing – Review and Editing; MLV: Conceptualization, Data Curation, Formal Analysis, Methodology, Writing – Review and Editing; MSK: Investigation, Methodology, Writing – Review and Editing; FW: Conceptualization, Methodology, Project Administration, Supervision, Writing – Original Draft, Writing – Review and Editing; MK: Conceptualization, Funding Acquisition, Methodology, Project Administration, Supervision, Writing – Original Draft, Writing – Review and Editing

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CONFLICT OF INTEREST

The authors have no conflict of interest to declare.

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