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Improving breastfeeding in rural Tanzania using Bardach's Policy Analysis Methodology

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Improving Breastfeeding in Rural Tanzania Using Bardach's Policy Analysis

Methodology

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Dedication

To my dear husband who has been extraordinarily patient as I have pursued a number of dreams these past few years. Thank you for your guidance, support, and being the remarkable rock on which I could lean on during some trying moments of this project's creation.

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Thank you to my advisors, Dr. Maria deValpine and Dr. Andrea Knopp, who helped me navigate some difficult waters in creating a viable project. I would not have been successful without your consistent guidance and patience.

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Abstract

Appropriate breastfeeding has the potential to have the broadest impact on childhood survival in children under five years (U5Y) compared to all other preventive interventions. The World Health Organization (WHO) and United Nations International Children's Emergency Fund (UNICEF) recommend that all facilities providing maternal services and newborn care have a written policy addressing breastfeeding that is routinely disseminated to staff. Shirati hospital, in rural Tanzania, does not have a breastfeeding policy. Bardach's 8-Fold Pathway for policy analysis methodology (adapted by Collins for health policy) was used to evaluate three promising breastfeeding policies to improve compliance with this recommendation. They include exclusive breastfeeding education, complementary food education, and community health worker (CHW) home visits. Analysis identified exclusive breastfeeding with adjunct complimentary food education as the most compelling policy to increase breastfeeding at Shirati hospital. With improved feeding practices, chronic malnutrition rates are expected to decline in and around Shirati.

Keywords: Pediatric malnutrition, Tanzania, policy analysis, exclusive breastfeeding, complementary food, community health worker, Bardach 8 Fold Pathway

Introduction

Malnutrition is one of the leading causes of death worldwide for children under five years old (U5Y) (WHO, 2017). It is found throughout Tanzania and persists specifically in rural areas such as Shirati district, located in the Mara region. This policy analysis will address chronic pediatric malnutrition identified at a hospital in Shirati, Tanzania, and evaluate which policies are best suited to improve this problem locally. After completing a literature review to identify gaps in standards of care affecting U5Y malnutrition health outcomes in Tanzania, a critical component was observed: a written breastfeeding policy at all facilities with maternal and newborn services is recommended by WHO and UNICEF (UNICEF, n.d). At present, Shirati hospital does not have a policy addressing breastfeeding. Using Bardach's (2005) and Collin's (2005) eight-fold path to policy analysis methodology, breastfeeding policies were evaluated to identify the most appropriate for this hospital to improve compliance with this recommendation and improve pediatric malnutrition rates. Geographical, political, and historical aspects of Tanzania will be addressed as part of the policy analysis.

Background

In 2016 more than 5.6 million children U5Y died from causes that were largely preventable or easily treatable. About half of the deaths of children U5Y are attributable to the underlying effects of malnutrition on disease processes (Paul et al, 2011; Raymond, Kassim, Rose, & Agaba, 2017). The leading cause of death in post-neonatal children includes diarrheal diseases and respiratory infections including pneumonia, for which malnutrition is a risk factor (WHO, 2017). One of the Millennium Developmental Goals (MGD4) was to reduce child mortality by two thirds before 2015 with interventions to

prevent malnutrition. This goal was not achieved and malnutrition remains a significant problem in low-income countries (Semali, Tengia-Kessy, Mmbaga, & Leyna, 2015).

Stunting is the expression of chronic undernutrition and is irreversible. It is one of the best indicators for pediatric health and reflects social indicators like disparities or discrimination (Aguayo, Menon, de Onis, & Branca, 2016). Wasting, also called acute malnutrition, puts children at a 5-20% higher risk for mortality from common diseases, such as pneumonia or diarrheal disease, when compared to other non-wasting children (Mother and Child Nutrition, 2017). In addition to mortality risk and stunting, malnutrition can also cause cognitive delays, susceptibility to infections, nutritional deficiencies, gross motor function deficits, and increases in national health care costs (Raymond, Kassim, Rose, & Agaba, 2017; Sudfeld et al., 2015). In Tanzania, 34.7% of the children are stunted, and wasting is found in 3.8% (Ministry of Health and Social Welfare, 2014).

While country-wide statistics are helpful in identifying and anticipating problematic issues for Tanzania as a whole, specific data for Shirati is limited. Data for the district level is available and found that stunting was moderate in 23.5% of the U5Y Mara district population and severe in 8.6% in 2014. Wasting was found to be moderate in 4.1% of the U5Y Mara population and severe in 0.8% of the population U5Y (Tanzania Food and Nutrition Center, 2014).

Current Tanzanian interventions to address malnutrition include: micronutrient supplementation for both pregnant women and children, water and sanitation hygiene (WASH) education, infant and young child feeding (IYCF) education, disease prevention and management (such as deworming or malaria treatment and prevention), treatment for

acute malnutrition, nutrition education in primary schools, child anthropometric assessments, and cash transfers for vulnerable populations. Of the interventions that target chronic malnutrition, there are only a few that have not been broadly disseminated in the Mara region. IYCF education is inadequate in Mara and has the lowest achieved target population rates compared to the other regions (United Republic of Tanzania, 2017).

Optimal breastfeeding has the potential to prevent over 800,000 deaths in developing countries for small children. This translates to 13% of all deaths in children U5Y, having the broadest impact on childhood survival in children U5Y compared to other preventative interventions (UNICEF, 2015). Three evidence-based, culturally appropriate infant feeding policies were identified for comparison in the Mara region of Tanzania. Exclusive breastfeeding education, complementary food education, and community health worker (CHW) home visits all have merit to improve chronic malnutrition in Tanzania.

Bardach and Collins Method

Bardach's policy analysis method, adapted by Collins (2005) for health policy, is comprised of eight steps (Bardach & Patashnik, 2016). These include defining the circumstances that make up the issue so that the problem can be better understood and framed. The problem will then be researched to identify evidence that supports several policy solutions. Once these policy options are identified, the outcomes will be projected with predictions on how each policy will affect the target population. Evaluation of the policies will be guided by the DECIDE framework with multiple domains, used by the WHO to develop their 2017 breastfeeding guidelines, to weigh the outcomes so that a

final decision can be made on which policy option is most appropriate. The following analysis aims to identify the most effective and sustainable policy to improve breastfeeding or an aspect of infant feeding for the target population in Shirati, Tanzania.

Define the Context

In Tanzania more than 40% of the population lives in regions where food shortages are common and 28% live below the poverty line (Altman, 2015; WFP USA, n.d.). Tanzania is ranked the lowest on the Human Development Index and is classified as a “least-developed country,” (WFP USA, n.d.) having one of the highest rates of undernutrition in both South and East Africa (Action Against Hunger, 2017).

Economically, 26.6% of Tanzania’s gross domestic product (GDP) comes from agriculture. Additional income comes from mining, construction, gold, natural gas, and tourism. Climate change is estimated to cost Tanzania 2% of its GDP annually by the year 2030. Because the agricultural sector employs so much of the population, it is expected that this will worsen the nutritional picture for the country with the heaviest burden on rural farmers (Action Against Hunger, 2017).

Tanzania is a coastal country with sub-Saharan climate. Communicable diseases are a significant resource burden, especially in rural areas where poor sanitation and limited access to safe drinking water are common. Poverty is predominantly found in rural areas with 40% living below the basic needs poverty line. The country is about equally split among Muslim and Christian religions, and the life expectancy is 59 years (The United Republic of Tanzania, 2013). It is considered one of the most peaceful countries in Africa and is governed by a presidential democracy that has operated since 1992. The political party Chama Cha Mapinduzi (CCM) is the dominant ruling power

since Tanzania's independence in 1961 and has won the last five general elections (Action Against Hunger, 2017).

Gender inequality continues to be a challenge in Tanzania where social customs limit women's rights. There are no political or legal frameworks to support this inequality, but it remains a cultural practice, especially in rural areas. The Tanzania Social Institutions and Gender Index score (SIGI) is high, showing discrimination, at 0.2504 (Social Institutions & Gender Index, 2014). SIGI scoring uses a multi-faceted approach to capture inequality throughout women's lifespan in the respective country. Women make up 50% of the population in Tanzania and they represent 52% of the employed population, 54% of the agricultural work force, and work an average of 62.3 hours weekly while men average 48.3 (Action Against Hunger, 2017). Despite this, women are rarely considered the head of the household, have low literacy rates, and often do not have medical decision-making power. This was especially true in Shirati where women often sought permission from their spouse before going to the hospital, even in emergencies. The chief medical officer at Shirati hospital stated this was a common practice and that it could waste precious time for medical interventions in an emergency (B. Chirangi, personal communication, March 15, 2017).

Shirati hospital, located in the Mara region of Tanzania, which is located in the northwest area of Tanzania near the border of Kenya and on Lake Victoria, is two hours from the closest town and five hours from the closest city. The hospital serves predominately low-income families in resource-constrained environments where a large portion of the population is below the UN poverty line. The hospital is in the Rorya district that has over 265,000 people (United Republic of Tanzania, 2013).

State the Problem

Shirati Hospital currently has no infant breastfeeding policy. UNICEF and WHO recommend that any hospital that treats women and children must have a written breastfeeding policy to improve infant nutrition. They have established global recommendations and guidelines for breastfeeding that include the initiation of breastfeeding within an hour of birth, exclusive breastfeeding for the first six months of life, and then introducing complimentary foods in addition to breastfeeding thereafter. These guidelines aim to improve childhood nutrition and decrease chronic malnutrition rates (WHO, 2017).

One of the main contributors to global low rates of exclusive breastfeeding is having hospitals, health care practices, or policies that are not explicitly supportive of breastfeeding. At the health-systems level, having a written breastfeeding policy is recommended as one of the first steps that facilities can take to improve exclusive breastfeeding practices and improve overall infant nutrition (WHO, 2014).

Search for the Evidence

Northern, Eastern, Lake, and Zanzibar zones of Tanzania were found to have suboptimal breastfeeding practices when compared to the rest of the country, especially in rural areas (Victor, Baines, Agho, & Dibley, 2013). Shirati is in a northern, lake, and rural region. A cross-sectional survey (Tanzania Demographic and Health Survey) done in 2010 found that only 46.1% of women reported initiating breastfeeding within one hour of giving birth, about 50% of infants less than six months were getting exclusive breastfeeding, and 17% of the infants surveyed were predominately breastfed. An updated report from 2014 showed that only 41% of Tanzanian mothers were practicing

EBF and that these numbers are lower than when they were measured in 2005 (Government of the United Republic of Tanzania, 2015). Currently only 4% of pregnant women and only 17% of lactating women in the Mara region are getting education regarding exclusive breastfeeding (United Republic of Tanzania, 2017). Focusing on target groups with suboptimal breastfeeding has been suggested as a starting point to improve overall breastfeeding rates (Victor, Baines, Agho, & Dibley, 2013).

Very early or delayed introduction of complementary foods is a common practice throughout Tanzania, however, there are no available statistics regarding women's education on complementary feeding practices in the Mara region (United Republic of Tanzania, 2017). One study suggests that the majority of infants in Tanzania are getting cereal based complimentary foods before reaching six months of age. These cereal based porridges are typically used without the addition of vegetables or animal proteins making them nutritionally insufficient (Muhimbula & Issa-Zacharia, 2010). The introduction of complimentary foods before the child is six months or the use of nutritionally inadequate foods has been identified as a major contributor to slowed growth rate, putting a child at risk for chronic malnutrition or stunting (Muhimbula & Issa-Zacharia, 2010).

In urban Dodoma the median age for the introduction of foods or non-breast milk fluids is three months and 90% of infants are exposed to these before being six months of age (Kulwa et al., 2014). A longitudinal study evaluated the use of complementary foods in children from the Manyoni district in central Tanzania and found that breastfeeding was common (used for an average of 21.7 months) but there was an early introduction of complementary foods. The introduction of complementary foods before six months was noted in 74.4% of participants. The main contributor to this was the mother's perceptions

that they had insufficient breast milk. While many of these women were seen in antenatal or postnatal clinics, older female family members were consulted more often regarding breastfeeding challenges rather than health care workers (de Bruyn et al., 2018).

Another intervention that has been utilized to improve breastfeeding rates is the use of Community Health Workers (CHWs). These are community members that provide healthcare support at the household level. They are typically chosen by the community and serve as trusted members that introduce interventions away from the hospital or medical group in which they are trained. They play an important role in rural communities by improving health care access, addressing educational barriers to preventative care, improving coverage for child and maternal health interventions, and improving follow up care for postpartum families (de Bruyn et al., 2017; Horwood et al., 2017). CHWs are utilized worldwide to improve access to health care services for a wide array of health issues including breastfeeding. In South Africa, they have been widely used to significantly reduce maternal and neonate mortality related to early disease recognition and appropriate breastfeeding practices (Horwood et al, 2017). In particular, CHWs utilized in the Pwani region in eastern Tanzania have been successfully integrated into the communities to improve new mother education (August, Pembe, Mpembeni, Axemo, & Darj, 2016).

Shirati College of Health Sciences, who is affiliated with Shirati hospital, offers a basic technician certificate in community health (Mabumbe-Mag, n.d). The certificate allows one to become a “general health aide” who can then become either a CHW, social work aide, or medical attendant (Devlin, Egan, & Pandit-Rajani, 2017). Despite the curriculum being completed at Shirati hospital’s affiliate school, these workers are not

employed by the hospital and are not involved with hospital sponsored community outreach.

Although breastfeeding is practiced in Shirati there is no formal teaching on when to start it, how often it should be reassessed, and when complimentary foods should be introduced. There is also no community outreach aimed at assessing breastfeeding practices or identifying high risk families.

Consider Different Policy Options

The WHO 2017 breastfeeding guidelines are composed of three essential parts: timing of breastfeeding, exclusive breastfeeding, and complementary feeding. These guidelines have the potential to be divided into several actionable policies that will fill the breastfeeding policy gap found at Shirati hospital. Policy options to be compared include: Introduction of WHO/UNICEF Ten Steps to Successful Breastfeeding with exclusive breastfeeding education, hospital-based complementary food education, and CHW home visits in the villages neighboring Shirati.

Exclusive Breastfeeding Education (EBE)

Exclusive breastfeeding, where only breast milk and no other liquid is fed to newborns and infants (except for vitamins, mineral supplements, or medicines), for the first six months of life has been identified as a preventive strategy against malnutrition. The WHO recommends this strategy be initiated within the first hour after birth and continued for a minimum of six months. After this period, breastfeeding should be continued with safe complementary foods that include local, indigenous foods until the child is two years old. The benefits of this exclusive feeding include risk reduction of

diarrheal or gastrointestinal diseases related to contaminated adjunct foods or formulas, risk reduction in acute respiratory tract infections, and improved child survival rates related to improved caloric and nutrient consumption (WHO, 2013).

Ten Steps for Successful Breastfeeding has been cited as a successful intervention to improve breastfeeding initiation, educational reinforcement, and delay early use of complimentary foods (Patil et al., 2015). This program was created jointly by WHO and UNICEF to consolidate all available evidence that supports different aspects of breastfeeding and has been used successfully throughout Africa (WHO, 1998). This program has significantly improved breastfeeding rates and is supported by a systematic review of 58 studies in 2016 (WHO, 2018). See appendix A for a list of actionable steps as recommended by UNICEF and WHO.

Complementary Food Education (CFE)

Complementary food education (CFE) specifically targets families with children aged 6-23 months and includes information on culturally appropriate indigenous foods that can be introduced at the age of six months in addition to breastfeeding.

Complimentary food education has been recommended as a vital component of child health programs and has been suggested as being a cost-effective intervention with long reaching and long-lasting positive impacts on child health (Muhimbula & Isssa-Zacharia, 2010). Complimentary food education programs can be structured into existing outpatient clinics and, with training, can use current health care staff. A CFE policy would include an educational session on complimentary feeding for hospital staff with special attention for those working with women and children.

Community Health Workers (CHW) Home Visits

Introducing a CHW program that focuses on breastfeeding at Shirati hospital is intended to reach patients outside the hospital walls and access rural communities that have very few healthcare resources. CHWs can be trained to assess for compliance with current breastfeeding recommendations and identify at risk families using the Integrated Management of Childhood Illness (IMCI) model (WHO, n.d). This model has been successfully used in Tanzania with other CHW programs (Ramsey et al., 2013). They can be integrated into the community to identify at risk families with barriers to successful breastfeeding and could provide resources for WHO guidelines on breastfeeding and complementary food practices. For high-risk families or those needing an elevated level of care, CHWs can refer patients back to Shirati hospital as needed.

Project the Outcomes

Exclusive Breastfeeding Education (EBE)

The introduction of an exclusive breastfeeding nutritional policy in Shirati has the potential to improve newborn consumption of breast milk, increase appropriate newborn caloric and nutrient needs, and decrease newborn infection rates. There is a six times greater chance of survival in breastfed children when compared to non-breastfed children, and an exclusively breastfed child is 14 times less likely to die in the first six months of life (UNICEF, 2015). In 2016 a systematic review looked at 58 maternity and newborn studies and found that there was clear evidence that Ten Steps improves not only the initiation of breastfeeding but also its duration and its exclusivity (WHO, 2018).

Complementary Food Education (CFE)

A complementary food education program intervention was implemented in rural Zimbabwe and in Zanzibar, Tanzania. For complementary food education to be successful, a thorough understanding of sociocultural factors must be a priority. These factors include why current behaviors exist, local beliefs about childrearing, and what nutritional options are available (Paul et al., 2011). There is an opportunity for this evaluation in the Ante Natal Care and Family Planning clinic at Shirati hospital but, without a thorough understanding about why current behaviors exist, it is possible that there may be resistance to change. The cultural acceptability for suggested foods or the timing on when to introduce foods will be extremely important for compliance.

Systematic reviews of complimentary food interventions found that multiple types of education (culturally appropriate group nutritional education, individual counseling, home visits, mass media, and interpersonal communication) have improved feeding practices, dietary compliance, child growth, and reduced anemia and morbidities. In order to be successful, these interventions must take into account food availability and the cost of dietary changes (Kulwa et al., 2014). This policy will also be especially difficult for mothers who are experiencing trouble with breastfeeding. The mother's perception that she has insufficient breast milk has been cited as one of the main contributors to introducing complementary foods early (de Bruyn et al., 2018). There will need to be available resources and nurses who can spend extra time with families who need additional support or who are at risk for failed breastfeeding. At this time there is no lactation specialist at Shirati hospital to identify at-risk mothers. By integrating this policy into already existing and trusted clinics at Shirati hospital, new mothers and infants may be screened at follow up appointments for other medical needs.

Community Health Workers (CHW) Home Visits

A cluster randomized control trial in South Africa demonstrated the importance of CHW continued education and how it can improve healthcare outcomes. CHWs, trained with the IMCI program, used algorithms to support pregnant women and assess children. CHWs conducted home visits to assess for nutritional risks and help mothers manage pregnancy concerns, assess sick children, and troubleshoot nutritional barriers. CHWs improved maternal and child health knowledge and improved EBF rates when compared to those who did not complete the training (Horwood et al., 2017). A randomized control trial used CHW, called Mentor Mothers, to improve recovery from malnutrition in similar environmental and sociocultural conditions to Shirati. By program's end, children who received the intervention were five times more likely to reach a healthy weight for their age when compared to the control group (le Roux et al., 2010).

The introduction of this policy will require hiring CHWs to be trained and transported to assigned villages. Currently CHWs are not being used by Shirati hospital, though general medical aids, who can later become CHWs, are trained at the nursing school so the role is somewhat familiar. To start a CHW program will require additional resources from the already financially constrained hospital. The use of student medical aids from the existing CHW program is not recommended because a major determinant of CHW success is that they be members of the target population (Cosgrove et al., 2014). CHWs already embedded within the community in which they will work have pre-established cultural understanding, trust, and inherent knowledge about existing health disparities. Generic medical aids, even if trained appropriately, will be unable to fulfill this requirement. Additionally, CHWs from Shirati's nursing school are assigned work

locations by the government. It would take a concerted effort between the hospital and the government to allow for the graduates to be allocated to Shirati hospital.

Without resources specifically designated for this policy option, the introduction of CHWs will not be feasible. While CHWs are generally considered to be cost effective for various health services (Ramsey et al., 2013; Vaughan, Kok, Witter, & Dieleman, 2015), there are associated start-up and maintenance costs. The average estimated annual cost of utilizing CHWs across all rural sub-Saharan Africa is approximately 2.6 billion dollars (McCord, Liu, & Singh, 2013). One study looked at compensation models for CHWs across rural sub-Saharan Africa and found it to be extremely variable. Authors estimated that it takes approximately 80.00 USD per month to train, transport, equip and supervise CHWs per month at a rural hospital (Taylor, Griffiths, & Lilford, 2017).

Without outside funding, CHWs are unaffordable for many rural programs.

Apply Evaluative Criteria

The updated 2017 WHO breastfeeding guidelines were based on developing and evaluating communication strategies to support informed decisions and practice based evidence (DECIDE) (WHO, 2013). The DECIDE framework for these guidelines used multiple domains to steer development and will be replicated in this policy analysis. These domains include quality of evidence, balance of harms and benefits, values and preferences, acceptability, resource implications, feasibility, and equity and human rights. These domains will be used as the evaluation criteria for the proposed policy options. Quality of evidence refers to the current available research to support this policy and the confidence that the outcomes studied will be representative in the target population. The

balance of harms and benefits refers to the comparison of desirable versus undesirable consequences of the proposed policy. Values and preferences refer to how the target population, the mothers in and around Shirati, perceive the policies' applicability to their situation or the facility where it will be introduced. Acceptability is similar, but references how health care workers and providers perceive the policy working at Shirati hospital. Resource implications will be how cost-effective the policy is and where resources may need to be diverted to implement the policy. Feasibility of the policy refers to instances where the policy was successfully implemented in other settings comparable to Shirati hospital. Equity and human rights refer to how likely the policy will reduce health inequities for both women and children and address those more vulnerable or at risk (WHO, 2017). The policy evaluation matrix table (below) directly compares the three policies across the evaluation domains.

Policy Evaluation Matrix Table

Policy	Quality of Evidence	Balance of Harms and Benefits	Values and Preferences	Acceptability	Resource Implications	Feasibility	Equity and Human Rights
EBE	+	+	+	+/-	+	+	+
CFE	+	+	+/-	+/-	+	+	+
CHW	+	+	+	+/-	-	-	+

Exclusive Breastfeeding Education (EBE)

There is overwhelming high-quality evidence that breastfeeding education for the target population is both appropriate and well-suited (WHO, 2018). The potential

benefits are extensive and there are no identifiable risks. The mothers in Shirati already practice breastfeeding, though not always exclusively, so it is already an acceptable practice. Clinicians at Shirati hospital may have more difficulty adopting the policy as it will require an adjustment in current practices. An educational change in how mothers are taught to feed their children will require attentive oversight until this has become normalized. Changing current routines will be the biggest barrier to successful implementation. Adoption of this policy will not cost Shirati additional financial resources but will require educational training sessions. Sessions of this type, however, are already utilized for training medical and nursing students. Hospital-wide change initiatives require careful planning and re-evaluation at steady intervals. Despite the type of change being implemented, adjustment to unforeseen complications and reinforcement will be needed. Once successfully introduced, this policy will likely improve the nutritional status of newborn children in Shirati and reduce health inequity, as has been shown in similar regions (WHO, 1998; WHO, 2018).

Complementary Food Education (CFE)

There is excellent, high quality evidence that supports complementary food education for both pregnant women and new mothers (Kulwa et al., 2014). There is no identifiable harm in this education and the benefit could have far-reaching consequences in addition to improving chronic malnutrition. Mothers will need to adjust how they are currently supplementing breastfeeding and this may have cultural impacts with the potential for resistance. This teaching will be acceptable at Shirati hospital as it can be implemented in an already established clinic. It will, however, require an adjustment in routines. This educational change will also require staff training, but it can be organized

without monetary resources. Although this change initiative will face challenges comparable to exclusive breastfeeding education, complementary food education has been successfully implemented in similar hospital settings and poses great potential in Shirati (Kulwa et al., 2014). Improving mothers' education about the safety and timing of complementary foods will greatly reduce health inequities in this region.

Community Health Workers (CHW) Home Visits

There is high quality evidence supporting the use of CHW (Haines et al., 2007; Horwood et al., 2017). There is no identifiable harm and the benefits will reach community members outside the walls of Shirati hospital. It is expected that target populations will welcome CHWs because they are already members of the community. Though the role of a CHW is understood at Shirati hospital due to the educational program at Shirati Nursing School, they are not currently used there. Introducing them at the hospital is expected to be acceptable to clinicians and nurses due to their familiarity with these types of programs. Implementing a CHW program may be difficult, however, because resources will need to be added or diverted from other health programs. While similar programs have been established in other regions with comparable populations, outside funding was typically used in those cases (Ramsey et al., 2013). This policy has the potential to reduce health inequities and provide resources for some of the most vulnerable populations in and around Shirati but may need external support not currently available.

Weigh the Outcomes

All three policy options have mostly positive findings, but exclusive breastfeeding and complimentary food education are nearly exclusively positive. The direct comparison, using the evaluative criteria, shows that exclusive breastfeeding education ranks highest, complimentary feeding education is second, and a CHW program is third.

Exclusive Breastfeeding Education

The exclusive breastfeeding education policy poses significant benefits and scores the highest using the evaluative criteria. The sole limiting barrier to exclusive breastfeeding education will be the creation of a written policy and the implementation process within the hospital itself. The policy will also require consistent evaluation until it has been fully accepted and practiced by staff.

Complementary Food Education

Complementary food education will meet similar implementation challenges as exclusive breastfeeding education. This includes the introduction of a new written policy and staff education, requiring evaluation and support. Another limiting factor is the potential for community resistance as current feeding practices are challenged. Evaluating current cultural practices will need to be done before change can be recommended. This policy will require community support as well as frequent hospital reeducation. There is potential for this policy to be successful, however, and the evaluative criteria show mostly positive implications.

Community Health Workers (CHW) Home Visits

The introduction of CHWs will face multiple barriers and, due to the need for financial resource reallocation, will likely not be feasible at present. Despite CHWs being cost effective and successfully introduced in similar settings with positive results, this policy is not the first choice for implementation. The resource needs and feasibility are limiting factors for this policy and will exclude it as an option at this time.

Make the Decision

Exclusive breastfeeding education should be implemented with the highest priority. The evaluative criteria scoring was extremely high with very little downside aside from the policy introduction in general and the need for reinforcement, as is required for any new policy. Complementary food education should be considered in addition to exclusive breastfeeding education, as this was a close second in terms of feasibility and benefit. The introduction of CHW home visits has too many variables to overcome for this to be an acceptable policy when there are other easier to implement options. Exclusive breastfeeding education is the preferred and recommended policy for introduction at Shirati hospital. Complementary food education is a feasible adjunct policy and should be introduced when families return to Shirati for follow up.

Summary and Conclusion

A literature review on nutritional interventions for chronic malnutrition reveals breastfeeding as the most sustainable, feasible, and culturally appropriate intervention for sub-Saharan Africa and, more specifically, Tanzania. WHO and UNICEF specifically state that all facilities providing maternal services and newborn care should have a written breastfeeding policy routinely disseminated to healthcare staff. Shirati hospital

currently does not have a formal policy on breastfeeding. Implementation of a culturally appropriate, institutionally feasible written breastfeeding policy at Shirati hospital can be expected to improve chronic malnutrition rates in Shirati, Tanzania and will satisfy WHO and UNICEF recommendations for breastfeeding interventions. Using evaluative criteria specific to the WHO's 2017 breastfeeding guidelines, exclusive breastfeeding education with adjunct complimentary food education policies were identified as viable policies and is recommended to be introduced at Shirati hospital. These interventions should improve newborn consumption of breast milk, improve newborn caloric and nutrient intake, and decrease newborn infection rates. These combined policies have the potential to improve compliance with international breastfeeding recommendations and, over time, improve stunting and chronic malnutrition rates in and around Shirati.

Appendix A

Ten Steps to Successful Breastfeeding (WHO, 2018)

Critical Management Procedures

1a. Comply fully with the *International Code of Marketing of Breast-milk Substitutes* and relevant World Health Assembly resolutions.

1b. Have a written infant feeding policy that is routinely communicated to staff and parents.

1c. Establish ongoing monitoring and data-management systems.

2. Ensure that staff have sufficient knowledge, competence and skills to support breastfeeding.

Key Clinical Practices

3. Discuss the importance and management of breastfeeding with pregnant women and their families.

4. Facilitate immediate and uninterrupted skin-to-skin contact and support mothers to initiate breastfeeding as soon as possible after birth.

5. Support mothers to initiate and maintain breastfeeding and manage common difficulties.

6. Do not provide breastfed newborns any food or fluids other than breast milk, unless medically indicated.

7. Enable mothers and their infants to remain together and to practice rooming-in 24 hours a day.

8. Support mothers to recognize and respond to their infants' cues for feeding.

9. Counsel mothers on the use and risks of feeding bottles, teats and pacifiers.

10. Coordinate discharge so that parents and their infants have timely access to ongoing support and care.

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