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The Acceptability of Clean Delivery Kits on the Atlantic Coast of Nicaragua: A Focused Ethnography

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Abstract

Anecdotal reports suggest rates of puerperal sepsis/umbilical cord infection in the Southern Atlantic Autonomous Region (RAAS) of Nicaragua are high, as maternal/infant mortality rates are. Clean delivery kits (CDKs; sealed containers, clean razor blades, soap, string to tie umbilical cords, and clean plastic sheeting) have been shown to decrease perinatal infection rates in low-income countries. Participant observation, focus groups, and key informant interviews with parties involved in delivery practices and policies were conducted in this focused ethnography to determine the cultural acceptability of CDKs for midwives in the RAAS. The CDKs were acceptable in their contents, although remain controversial. Although evidence points to deliveries taking place at home without the use of sterile equipment, the Ministry of Health policy is for deliveries to take place in hospitals/health clinics.

Keywords

eastern Nicaragua; midwives; Bluefields; women's health

Maternal mortality related to complications from childbirth or pregnancy is a significant health issue globally. In 2000, the United Nations adopted the Millennium Development Goals (MDGs) to address eight global challenges, and the fifth MDG is to reduce maternal mortality between 1990 and 2015 by three quarters (United Nations [UN], 2010). The UN (2010) notes that the leading causes of maternal mortality include hemorrhage and hypertension. These are responsible for approximately 53% of maternal deaths globally although both can be prevented and/or managed. Maternal sepsis accounts for approximately 8% of maternal mortality globally (UN, 2010).

Current progress towards this MDG varies by geographic region. Localized culturally appropriate and acceptable interventions are necessary to achieve sustainably improved health outcomes (Leffers & Mitchell, 2011). Strategies to address maternal mortality include increasing access to quality reproductive health resources for women globally (UN, 2010). The purpose of this study was to explore the cultural acceptability of one such resource called clean delivery kits (or CDKs) on the Atlantic Coast of Nicaragua.

Characterized by ethnic diversity, the Atlantic Coast of Nicaragua is home to six distinct ethnic groups. Little is known about the health experiences of each of these ethnic groups.

Thus, this study sought to explore the cultural acceptability of CDKs designed to decrease maternal mortality within the diverse cultural context of the Atlantic Coast of Nicaragua.

Clean Delivery Kits

One effective way to address health complications related to deliveries is through CDKs. CDKs are sealed plastic bags that include a plastic sheet, a razor blade, three cord clamps or string (dental floss), soap, and instructions for use. The kit may also include a pair of gloves and a bulb syringe. Several studies have described the use of CDKs in low-income countries and have recently shown that the presence of the kits has improved the cleanliness-related behaviors of midwives.

Two recent studies have demonstrated the efficacy of the kits. Winani et al. (2007) combined the CDKs with teaching clean techniques to lay midwives in Tanzania. In a sample of 3,262 pregnant women, researchers found that if the mothers were delivered using the CDKs, they were less likely to develop puerperal infection (OR 3.2, $p = .001$) and their babies were less likely to develop cord infections (OR 13.1, $p = .001$). Darmstadt et al. (2009) conducted a similar study with 334 Egyptian women. In a bivariate analysis, children of mothers who used the kits compared to those who did not were less likely to develop cord infections ($p = .025$), and were less likely to develop puerperal sepsis ($p = .024$). Multiple logistic regression analysis showed an independent association between CDK use and cord infection ($p = .041$). The analysis was borderline for puerperal infections ($p = .057$).

In a qualitative study, Beun and Wood (2003) explored the acceptability of CDKs in Nepal. Because umbilical cords are traditionally cut on a coin for good luck, a clean plastic coin had to be added to each kit. Decisions regarding whether to use CDKs were made by the mother-in-law and the husband, not the midwife or the mother. Discarding any kind of equipment was considered waste-ful and as a consequence, CDKs often were reused. The soap in the kit was understood to be for bathing the baby and not washing the midwives' hands. Midwives used only one cord tie instead of the three provided.

In light of the work of Beun and Wood, it was deemed necessary to conduct a focused ethnographic study to discover those things that might affect the acceptability and use of CDKs in a culturally diverse setting before any attempt to introduce them. Because these kits had been shown to reduce maternal/child morbidity and mortality in other settings, if they proved to be culturally acceptable, the next step would be to implement them to determine their effectiveness in decreasing maternal/child morbidity and mortality.

The Atlantic Coast of Nicaragua

Nicaragua is the second poorest country in the Western Hemisphere (U.S. State Department [USSD], 2008). The Southern Atlantic Coast of Nicaragua, called the Southern Atlantic Autonomous Region (RAAS, in its Spanish acronym), is unique in its ethnic makeup and relatively isolated from the rest of the country. The only city in the region is Bluefields, with a population of approximately 48,000. Six ethnic groups live in the mostly rural RAAS: Mestizo (mixed European and indigenous American descent); Creole (of African descent); Garífuna (a second Afro-Caribbean group); and Rama, Sumu, and Miskitu (three indigenous groups). It is only within the last 3-4 decades that the Mestizo population has been predominant on the Atlantic Coast, where previously the Creole population had been. Because of political and economic instability, the region has seen a significant amount of migration. The lingua franca for the area is Spanish, but an English-language based Creole is also spoken, as well as three indigenous languages (USSD, 2008). Each culture also has unique health beliefs and practices. Within this diverse cultural context, special and specific

attention must be paid when introducing any health intervention that might be influenced by cultural beliefs and/or practices.

Little research has been conducted exploring the health and health experience of each of the populations living on the Atlantic Coast of Nicaragua. Barrett (1993) chronicles the growth in health-related infrastructure on the Atlantic Coast since the 1979 Sandinista Revolution and notes the importance of cultural competence in health care provision in this diverse region. Coe (2008) has conducted the only study on midwives and maternal health on the Atlantic Coast, and describes in detail traditional practices used by Rama midwives living on Rama Cay (a site included in this study as well), with emphasis on the specific plants used in traditional medicine there. Coe notes that 70% of births in eastern Nicaragua take place at home, suggesting that adoption of CDKs could make a significant impact on maternal outcomes.

For all of Nicaragua, there are 4.4 births per woman, but the rate is higher in the rural areas (Pan American Health Organization [PAHO], 2008). The infant mortality rate is 31.0 per 1,000 live births, and the maternal mortality ratio is 86.5 per 100,000 (Pan American Health Organization [PAHO], 2007). When compared to other countries in Central America, the infant mortality rate in Nicaragua is higher than the region's 29.6 deaths per 1,000 live births, and the maternal mortality ratio is lower than the 109.2 per 100,000 of the region (PAHO, 2007). According to the Ministry of Health of Nicaragua (Ministerio de Salud, 2009), the maternal death rate in Nicaragua includes a percentage of women who died of puerperal sepsis caused by a "dirty" delivery. Health statistics disaggregated by ethnic group or geographic region within Nicaragua are not available internationally. Because most of the health care agencies and much of the population of Nicaragua is on the Pacific Coast, it is difficult to determine how the statistics for the whole country apply to the predominantly rural and poorer Atlantic Coast. Anecdotal reports indicate maternal morbidity and mortality on the Atlantic Coast are worse when compared with the rest of the nation.

Some health care is privatized in Nicaragua, but most is provided through the *Ministerio de Salud* (MINSa), a national governmental agency headquartered on the Pacific Coast of Nicaragua. Health care in rural areas is provided through health centers, which are sometimes served by nurses and physicians who travel from one center to another. These health centers are also sometimes staffed by a physician and nurse (or nurse alone) who do not travel. Nicaraguan health policies require that student nurses and physicians in their final year of training spend a year providing public service in a rural area before they are eligible for national licensure. These students are often the most consistent health care providers at the rural health outposts (personal communication, April 13, 2010).

Within this economic and political context, the purpose of this study was to explore the cultural acceptability of CDKs on the Atlantic Coast of Nicaragua. Authors sought to describe current birthing practices to better understand localized health care provision and to describe cultural considerations imperative to the potential implementation of CDKs designed to improve maternal mortality.

Methods

Focused ethnographic methods were used in this study, including participant observations, focus groups of midwives, and key informant interviews. A focused ethnography is complementary to the standard ethnography and is aimed at answering a specific or practical question that needs to be addressed before further research can be conducted. A focused study is usually of shorter duration than a standard ethnography and with more intense data collection on a narrower question (Knoblauch, 2005). The first author was conducting a

larger ethnography on the health experiences of Creole women in Bluefields (the political seat and largest city in the RAAS), and the second author joined the first author during the spring and summer of 2010 to conduct this focused ethnography. This study was approved by the Institutional Review Board (IRB) of the University of Virginia.

Setting

Data were collected at MINSA offices and clinics, at the Bluefields Indian and Caribbean University (BICU) in Bluefields, and in rural health centers in Rama Cay and Kukra Hill. The latter two communities are villages in the RAAS only accessible by boat. Rama Cay is one of a series of islands south of Bluefields peopled by the Rama Indians. The health center on Rama Cay is staffed by a registered nurse (RN) who is permanently assigned there and a certified nursing assistant who is not.

Kukra Hill is a community northwest of Bluefields. Originally the home of Kukra Indians, it is now primarily inhabited by Mestizos who farm in the surrounding area. Spanish is the language of most of the population although there are some Creole speakers. Two physicians work at the health center (one permanently assigned and another performing the mandatory year of service after graduation from medical school). One permanent RN staffs the facility, and at times, graduate nurses are assigned to the center. MINSA officials aided researchers in establishing meetings with the lay midwives in Kukra Hill and on Rama Cay.

Sample

Two midwives and an RN from MINSA participated in the focus group on Rama Cay. Nine midwives and an RN from MINSA participated in the focus group in Kukra Hill. When asked, lay midwives in both places uniformly stated that they learned their trade from their mothers and/or other midwives and had no formal (MINSA) nursing or medical training. The midwives in the study had all been practicing for a number of years.

Procedures for Data Collection and Analysis

Focus Groups—MINSA officials on Rama Cay and in Kukra Hill helped researchers identify potentially interested midwives to participate in focus groups. The first and second author then conducted both focus groups. Midwives and RNs were consented and then participated in single focus groups lasting approximately 1 hour. Focus groups were conducted in Spanish with the aid of a translator.

Key Informants—To augment focus group findings, five key informants were interviewed by the first and second author based on professional expertise or personal experiences working with women's health or directly with midwives in communities surrounding Bluefields. Key informants included Ministry of Health officials involved in maternal/child health and clinicians in and around Bluefields. Each was interviewed for approximately 1 hour, and the majority of interviews were conducted in English (any conducted in Spanish were done with the help of a translator). Questions ranged from: current birth practices; cultural acceptability of the CDKs and their components; training of midwives, nurses, physicians; MINSA policies specific to the study; and the cultural context unique to the RAAS.

Data Analysis—Faculty of nursing at the Bluefields Indian and Caribbean University (BICU) School of Nursing (currently the only school of nursing on the Atlantic Coast of Nicaragua) advised with the development of the study and the maintenance of ethical protocols, including ensuring that all study questions and materials were culturally appropriate. Participant observation, key informant interview, and focus group data were separately coded by both authors, and from this, findings emerged. Rigor was addressed

through creating an auditable trail of research decisions made in order to promote transparency (Sandelowski, 1993).

Results

According to the director of the school of nursing at BICU, 73 midwives work in Bluefields. Data on who is delivering babies in the rural areas surrounding Bluefields are not available. Most of the deliveries are at home and are attended by lay midwives (Coe, 2008; personal communication, July 5, 2010).

The acceptability of the CDKs was based on three considerations: the contents of the kits, the need for the kits, and the political acceptability of the kits.

First Consideration: The Contents of the Kits

All the midwives and professional clinicians found the plastic sheeting, floss, and razor blade (referred to by its brand name, Gillette, by everyone) acceptable. Many midwives and nurses believed that an alcohol-based hand gel would be better than a bar of soap. No other items were suggested for the kits. Many said that they had used kits like these in the past (provided by MINSA) but did no longer. Such kits going out of use was important information.

Supplies for the kits were easily located by researchers and relatively cheap in stores in Bluefields although it would have been more difficult and presumably more expensive to locate the CDK components in Kukra Hill and on Rama Cay. Hardware and building supply stores in the central area of Bluefields carried several varieties of plastic sheeting. A two-foot by two-foot sheet (the thickness of a shower curtain) was easy to find, and bleach in which to soak the plastic before it was put in the kit was readily available. Pharmacies and corner convenience stores (*pulperias*) carried packs of three individually wrapped blades, bar soap, and waterless hand sanitizer gel. Groceries and stalls in the central market sold gallon-sized plastic bags of freezer-bag thickness in which to fit the components of the kits.

Because of the relative inaccessibility of Bluefields and the RAAS from the rest of the country (there is no direct overland route from the capital, Managua, to Bluefields), presumably inexpensive items such as these can sometimes be more expensive. Still, the approximate cost of each kit was less than US\$2.00.

Second Consideration: The Need for the Kits

On the Atlantic Coast of Nicaragua, four different birth scenarios affected the need for the kits: hospital births for women living in Bluefields, hospital or health center births via *casa materna*, traveling by *panga* to the hospital or health center, and births attended by midwives.

Hospital Births for Women Living in Bluefields—The first scenario is hospital births which were common in Bluefields and many nearby areas. The CDKs were not required because hospitals had sterile (autoclaved) cord clamps, scissors, and other equipment. Women came to have hospital births through three different routes. The first route was for women who lived in Bluefields who most often took a taxi to the hospital once labor was established.

Hospital or Health Center Births via Casa Materna—The second route to the hospital was through the Bluefields' *casa materna*. Women from rural areas come a few days or weeks before their due date and live there. There are currently two *casa maternas* in the

RAAS, one in Bluefields next to the hospital and another in Kukra Hill located about five miles from the health center. Both are buildings with a kitchen, facilities to wash clothing, and sleeping dormitories (including mosquito netting for all beds because malaria and dengue are endemic). The *casa materna* in Bluefields can house roughly 20 women. This number does not represent the number of expecting women because females in family, sisters and mothers, can stay with the women. The *casa materna* in Kukra Hill is smaller but can house roughly 12 women. The *casa maternas* were established to serve women in rural areas who are determined to be high risk by a physician or nurse working in a rural area. These are women who require immediate attention when they go into labor and for whom a long trip to the hospital or health center would be dangerous; for example, women determined by palpation to be carrying twins or women with histories of placenta previa or abruption.

Traveling by Panga to the Hospital or Health Center—A third route for a hospital birth was confined to nearby villages, such as Rama Cay, where women already in labor were brought to the hospital at Bluefields if they failed to progress, bled heavily, or developed other problems. But the trips to the hospital were by *panga*, an open canoe-shaped boat with an outboard motor and limited running lights. Thus, the trip was only considered safe during the day in calm seas. Sometimes, a moonlit passage with clear skies and minimal wind was considered calm seas. The nurse at Rama Cay explained that it was better to take a chance delivering at the health center on the island than to endanger both mother and baby in a boat ride on heavy seas or in total darkness.

Births also took place in the rural health centers in places like Kukra Hill and Rama Cay when the weather was not cooperative. The health centers were supplied with autoclaves and sterile equipment for births. MINSA had begun a push to have all births occur in the hospital in Bluefields or the health centers in 2007 in order to decrease the maternal child morbidity and mortality. The goal was to have all pregnant women come to the health centers for prenatal care and then to be delivered there by the lay midwife (if the woman chose) or by the nurse or physician.

Births Attended by Midwives—The protocol was for the midwife to come with the expectant mother to prenatal visits at the clinic. During one of these prenatal visits, the doctor or nurse would give sterile equipment for the birth. The stated goal was for the women to come in to the clinic with the midwife for delivery. If there was an accidental home birth, the mother was to be transported to the health center as soon as possible.

If most births took place in hospitals or in health clinics and midwives were given sterile supplies, there would be no need for CDKs. But we were told that the protocol was not always being followed and many births took place at home without sterile equipment.

Third Consideration

The Political Acceptability of the Kits—As noted earlier, MINSA officials helped us establish meetings with the lay midwives in Kukra Hill and on Rama Cay. The meetings were ostensibly to allow us to gather data, but the MINSA professionals wanted to use the meeting at Kukra Hill to teach and reinforce their protocol. In Kukra Hill, the health center nurse, joined later by the physician, told the midwives how important it is that they bring all their clients in for prenatal care. She also said that when midwives brought their clients in for deliveries the midwives could attend and do the actual delivery. From the reaction of the midwives to this message, it was clear that they had heard it many times before. They would repeat back to the nurse the many advantages of prenatal care and delivery in the health center.

At the beginning of the focus group before the talk by the professionals, however, the first question we asked was: Where are babies born? The group of lay midwives answered in unison “at home.” This answer was in spite of the fact that the group was meeting in a *casa materna* where women were waiting to deliver at the Kukra Hill Health Center. We were told that home births were also common on Rama Cay despite the presence of the health center and the promise of a short ride to Bluefields.

At the meeting at Kukra Hill, the lay midwives were also asked what they used when they were delivering at home and they said “Whatever [they] found in the house: scissors, a blade ... and cloths.” Later, after the nurse lectured on the advantages of prenatal care and the availability of equipment from the health center, the lay midwives corrected themselves and said they had been describing the way things used to be done but now they did what the nurse had described—used sterile equipment from the health centers.

At the end of the meeting, the midwives said that what they wanted most were boots, raincoats, and flashlights. It was clear that they intended to continue delivering mothers at home not bringing them to the health center. Although there are no observations to verify, the insistence and repetition of the nurses that midwives should bring patients in for prenatal visits probably indicates that this is not happening often. The midwives’ impromptu report of using whatever they could find in the homes to cut and clamp cords seems to indicate that a great many births, if not the majority of births in the Atlantic Nicaraguan rural areas are being attended by lay midwives who do not have sterile equipment. The CDKs appear to be needed.

Officials of MINSA explained, however, that their goal is to institutionalize birth in Nicaragua. The level of maternal–child infection is too high, and MINSA has decided that the intervention of professional nurses and physicians is necessary. In places like Kukra Hill, the professionals have decided that not all births are taking place at the health center so they are pushing lay midwives to bring clients for prenatal care and, when they do so, are providing sterile equipment for deliveries for free. The reason many women are presumably still not being brought to the health centers for prenatal care is not clear. However, the uncoached testimony of the midwives and the necessity of repeating the need to bring women to the health center indicate they are not. This may have to do with incentives for midwives and their clients. MINSA provides free care. But we were told often of the disruption and expense for mothers of traveling to the health centers, especially over long distances, when other children have to come along or be provided for at home. Midwives charge for deliveries and therefore have little incentives for bringing women into the centers for free care. The midwives argued that for generations they have been providing this service, and they understand the culture and practices of the women in their own communities. They are not averse to learning how better to do their jobs and want to attend workshops and training. Historically, MINSA has provided training to lay midwives (Barrett, 1993; Coe, 2008). MINSA officials in Bluefields confirmed that they do periodically offer trainings emphasizing the need to bring mothers to the hospital or health center to midwives in rural areas surrounding Bluefields.

Conclusions and Recommendations

CDKs are acceptable in their content to midwives in this region of Nicaragua. It also appears that many women in the region do not have the use of sterile equipment. Therefore, the CDKs are needed. However, as MINSA intends to institutionalize births in the RAAS, it is unlikely that midwives will be able to access and use CDKs to attend home births in the communities surrounding health centers. A program that would provide CDKs to midwives and their clients in the RAAS could be seen as working against the goals of MINSA, which

include bringing pregnancy and birth into the professional health care system. This is a crucially important consideration for any international health initiative, as for any potential health intervention to be sustainable, local stakeholders must buy in and goals must be congruent to sustain partnership (Leffers & Mitchell, 2011).

Recommendations based on this study are that CDKs be provided to lay midwives who would be trained in their use. It is unlikely that the presence or absence of these kits will have an effect on whether home births continue in rural RAAS, but it may decrease morbidity and mortality of women and babies. However, any introduction of CDKs should be accompanied by extensive data on how they are used and on the details about how most babies are delivered in these rural areas. MINSA officials' and health care professionals' knowledge of existing midwife practices was sketchy and incomplete. How many babies are born at home and under what conditions are unanswered questions that need to be addressed, specifically in the diverse cultural context of the Atlantic Coast.

In addition, there were several apparent implications for practice. According to those clinicians and administrators at MINSA we spoke with, there was no mechanism for feedback from the midwives for their input on the new policy. This means MINSA is currently lacking important community-specific data necessary to evaluate the effectiveness and utility of their current hospital/health-center-only birth policy.

Implications for research include the necessity of a culturally competent approach. It was crucial for this study that we met with a variety of stakeholders to discuss relevant issues of practice, and thus were able to better appreciate the issue from the points of view of both MINSA and the lay midwives. This perspective is vital to the provision of culturally and politically appropriate and acceptable maternal/child health care in resource-limited communities globally. International aid efforts, regardless of intention, will potentially be unsustainable without culturally appropriate considerations and local buy-in from existing health infrastructure (Leffers & Mitchell, 2011).

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