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Ethnicity and breastfeeding in Kenya

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Abstract:

Breastfeeding bestows a myriad of nutritional and anti-infectious benefits to a child. However, despite recommendations by World Health Organization and countless other national and international organizations, many mothers terminate breastfeeding earlier than recommended. Current literature features numerous studies that have sought to determine patterns in sub-optimal feeding; however, these studies often fail to examine the role of cultural tradition as a variable independent of geographic region or socioeconomic status. This study examined the breastfeeding habits of women from four different ethnic groups – the Kamba, Kikuyu, Luo and Maasai – all living in a slum community near Nairobi, Kenya. Analysis of variance between the four cultural groups revealed that Maasai mothers breastfed for a significantly shorter duration than mothers from the Kamba, Kikuyu, or Luo ethnic groups. These findings indicate that cultural tradition should be taken into account in breastfeeding-related education, training and promotion.

Background

Benefits of breastfeeding

The benefits of breastfeeding for child nourishment, growth, and protection against disease cannot be overstated. Breastmilk provides protein, carbohydrate, and lipid macronutrients vital for infant growth, weight gain, and metabolic development (Heinig 2001, Kramer 2002). It secretes IgA antibody molecules that expose the infant's naive immune system to intestinal microflora, promoting rapid development of the infant's limited immune system (Hanson 2002). For example, secretory anti-*Giardia lamblia* molecules in breastmilk can protect against infection by this diarrhea-causing parasite (Walterspiel 1994). Additionally, children who had been breastfed performed higher on

cognitive tests than those who were never breastfed, even after adjusting for covariables such as mother's education and socioeconomic status (Anderson 1999).

Furthermore, breastfeeding has been shown to decrease frequency and severity of a multitude of diseases common in infants. Infants who were not breastfed are twice as susceptible to otitis media, or middle ear infection, as infants who were breastfed for at least four months (Duncan 1993). Breastfeeding exclusively for more than four months significantly decreases the infant's susceptibility to asthma and lower respiratory infections (Oddy 1999), otitis media or middle ear infection (Duncan 1993), and *Haemophilus influenza* type B (Cochi 1986). In addition, breastfeeding can protect against a wide range of specific viral and bacterial pathogens that cause diarrheal disease in children. This fact is crucial, as diarrheal disease is one of the leading killers of children under five years old, killing roughly 800,000 each year (UNICEF 2009). It secretes anti-*Giardia lamblia* antibodies to defend against infection from this parasite, lessens the severity of Shigellosis (Clemens 1986), eliminates symptoms of rotavirus (Espinoza 1997), and reduces length and severity of infections by enterotoxigenic *E. coli* (Long 1999). In fact, infants breastfed exclusively for at least four months were two to three times less susceptible to diarrheal disease than infants fed supplemental food or liquids before the same age (Popkin 1990). Evidence also suggests that it protects against a wide range of systemic infections, including sudden infant death syndrome (Ford 1993), Crohn's disease (Koletzko 1991), and even the cancers that most frequently affect children, leukemia and lymphoma (Shu 1999, 1995). The list of diseases and symptoms that breastfeeding can prevent or attenuate is as varied as it is numerous.

Other aspects of breastfeeding, both cultural and biological, can also benefit the child's health. Frequent breastfeeding delays the return of the mother's monthly ovulation (Kramer 2002), potentially delaying a second pregnancy (Van Landingham 1991) and reducing the number of births per mother. Furthermore, in some cultures, social taboos prevent mothers from returning to sexual relations while breastfeeding (Van Landingham 1991). Among the Gogo women of Tanzania, a woman who becomes pregnant while breastfeeding, especially before the child is one year old, may be judged, ridiculed, and reprimanded by her peers and elders (Mabilia 2005). For families living in poverty, reducing sibling competition can increase the health and fitness of each individual child, as scarce resources may be concentrated on a smaller number of individuals.

Because of these well-documented benefits, the World Health Organization encourages mothers to participate in a significant period of exclusive breastfeeding. These recommendations are especially relevant in developing countries, where access to alternate or supplemental nutrition is unavailable or cost-limiting. The official WHO recommendation is as follows, as written in the Global Strategy on Infant and Young Child Feeding:

"As a global public health recommendation, infants should be exclusively breastfed for the first six months of life to achieve optimal growth, development and health. Thereafter, to meet their evolving nutritional requirements, infants should receive nutritionally adequate and safe complementary foods while breastfeeding continues for up to two years of age or beyond." (WHO 2002).

In Kenya specifically, public officials are working to promote and encourage exclusive breastfeeding. Following a seven-year national breastfeeding promotion campaign in the 1980s, Kenyan health care workers were significantly more knowledgeable about and active in encouraging mothers to breastfeed early and exclusively (Bradley 1992). More recently, in September of 2012, the Kenyan Parliament passed a bill requiring infant formula to contain notice labels detailing appropriate use of formula. The bill also bans gifts of formula samples to health workers in an effort to encourage the health workers to promote natural breastfeeding. These measures by the WHO and the Kenyan parliament are just two representations of a widespread initiative by health professionals and policymakers to promote breastfeeding, and they correspond to an overall increase in breastfeeding levels. In Kenya, the number of infants who were breastfed exclusively for six months more than doubled between 2003 and 2009, rising from 13 to 32 percent (KNBS). However, this still leaves over two-thirds of Kenyan babies who are not breastfed optimally.

Predictors of sub-optimal feeding

Despite overwhelming evidence in support of prolonged breastfeeding, many mothers wean their babies well before the recommended age. Even many years after the publishing of the WHO guidelines, widespread understanding and implementation has been a slow process. Various cross-sectional studies have shown that a majority of nurses or healthcare workers in African hospitals were unaware of the appropriate breastfeeding practices, recommending water, formula milk, and solid food to infants before six months of age (Shah 2005) or even citing breast milk as a cause of diarrheal disease and mental

retardation (Utoo 2012). Even among mothers who support breastfeeding and understand its value, several factors may lead to early termination. Mothers who consciously terminate breastfeeding early cite perceived difficulties or inconvenience associated with breastfeeding, their own poor health habits, the need to return to work or school, pain, and prior negative experiences with breastfeeding as reasons to initiate weaning (Dennis, Simard 2005). As suboptimal feeding puts children at a higher risk of infection and mortality, determining the factors that may predict this behavior is the first step toward addressing these deficiencies.

Adverse living conditions in Kenya further complicate breastfeeding decisions. According to the UN, a slum is defined as a community characterized by inadequate housing security and structure, overcrowding, and insufficient access to sanitation, clean water, and appropriate infrastructure (UN 2002). Living in poverty often leads to food insecurity and malnourishment (Von Braun 1993). Diarrheal diseases are especially prevalent in areas with poor water quality (WHO 2003), a staple of slum communities. Infectious diseases and emerging epidemics spread more quickly in overcrowded living conditions (Siegel 1997). The rate of HIV/AIDS infections in slum communities in Kenya is 13%, nearly twice that of the national rate of 7% (Merkel & Otai, 2007). Though mother-to-child transmission of HIV is a pressing concern, researchers have found that children of HIV-positive mothers who breastfed exclusively for at least six months were half as likely to become infected after six weeks than children whose diet was supplemented with breastmilk alternatives before that age (Coovadia 2007).

Due to these additional risk factors, the nutrients, antibodies, and vitamins that breastmilk provides are even more critical to the health of a child raised in a slum. However, some mothers living with poverty and food insecurity express concern that breastmilk will not provide adequate nutrition (Fjeld 2008). Even when mothers are aware and approving of exclusive breastfeeding, they feel that their own nutritional inadequacies would lead to insufficiently nourishing breastmilk for their child, and therefore will complement the child's diet with supplementary foods (Fjeld 2008, Sibeko 2005). However, studies have shown that breastfeeding remains the best method of child feeding for at least the infant's first four to six months of life, as even malnourished mothers can produce adequate breastmilk (Huffman 1990).

The factors influencing a mother's breastfeeding decisions and practices are multivariate and personal, but it is possible to identify trends in a population. Several factors are often correlated with patterns in breastfeeding duration, including the mother's marital status, education level, or socioeconomic status, or the child's sex and perceived size (Kimani-Murage 2011). However, different surveys have found conflicting results about what qualities predict suboptimal weaning. In a Canadian study, university-educated women were more likely to initiate breastfeeding than high school graduates (Simard 2005). In contrast, a broader study by the National Research Council Panel on Fertility Determinants found that more educated mothers breastfed their children for shorter durations (Bulatao 1983). In an Ohio State University Hospital, older and more affluent mothers had higher breastfeeding rates (Grossman 1990), while breastfeeding decreased with increasing affluence among urban women in Thailand (Knodel 1980). A plethora of determinants can influence the initiation, duration, and exclusivity of breastfeeding, and

trends and patterns are by no means universal. The societal differences between Thailand and Ohio, for example, are obvious and unavoidable. Cultural and ethnic heritage has a tremendous impact on nearly all health-related decisions and practices, including infant feeding. Despite this fact, however, little research has been conducted to determine the impact of cultural tradition and ethnicity while controlling for socioeconomic standing, education level, or immigration status variables.

The importance of cultural variation

Cultural variation can impact health, education, and access to support, all factors that can affect the duration of breastfeeding. Access to education and support varies broadly among ethnic groups, often depending on proximity to urban settings and the ruling elite (Alwy 2004). Health status between ethnic groups in Africa also varies dramatically – one study observed that the Luo’s mortality rate for children under 2 years old was double that of the Kikuyu (Tabutin 1992). In breastfeeding-specific studies, the cultural factor is occasionally taken into account. An eastern Massachusetts study found that immigrants were far more likely to breastfeed for the recommended amount of time than American-born women of the same socioeconomic status. This correlation was an even stronger predictor of optimal breastfeeding than the wealth or education level variables (Celi 2005), indicating that cultural tradition is a significant factor. However, these studies often fail to investigate the role of ethnicity independent from socioeconomic status or geographic location. It’s true that ethnicity is a continuum and the lines separating ethnic groups can be blurred, especially in urban Africa (Cohen 1974). However, cultural practices handed down over decades in a specific ethnic group could have a profound

impact on how and when a mother decides to wean her child. In this study, culture is defined as the practices and beliefs common to a particular group that are transmitted through social means (Phinney 1996). Many distinct and diverse cultural groups live together in individual slum communities in Nairobi, under very similar living conditions (KNBS, 2010). Therefore, these Kenyan slum communities provide an ideal controlled setting to study culture as a variable independent from geographic region and socioeconomic status.

Cultural groups represented in the study

Though they now inhabit the same slum communities, the Kikuyu, Kamba, Luo, and Maasai all have unique and distinct cultural histories. The Kikuyu and the Kamba, the two most closely related ethnic groups in this study, have had culturally distinct lineages for at least five hundred years (Kaplan 1984). The Kamba originated as hunter-gatherers, but transitioned to an agriculture-based economy upon arrival in the Mbooni Hills region of Kenya in the 1600s (Kaplan 1984). The Kikuyu, another agricultural Bantu tribe that migrated to East Africa, traditionally made their living farming millet, beans, and maize (Middleton 1965). They lived on land jointly owned by their own *mbari*, or clan group descended from a common ancestor and ranging from a few dozen to several thousand members (Middleton 1965).

The Luo and Maasai, by contrast, are not of Bantu origin. The Luo arose from the Western group of Nilotic tribes, most likely emerging as a distinct group in South Sudan sometime during the first millennium (Ogot 1967). Early Luo were

predominantly fishers, farmers, and herders with roots in the Lake Victoria region, immigrating to Kenya around the beginning of the sixteenth century (Ogot 1967).

The final ethnic group that was included in this study, the Maasai, also emerged from a period of Nilotic expansion (Spear 1993). The Maasai as we know them today may not have made a distinct break from other groups until the seventeenth century or later (Spear 1993), but they take their roots in pastoralist groups dating back hundreds of centuries. Though they did include some agricultural practices, the dominating force in the Maasai economy was the herding and hunting of livestock (Hodgson 2001). This fact was a defining characteristic of the Maasai, widely acknowledged by their neighbors. One creation myth of the Kikuyu reflects their relationship with the 'People of Cattle' (Spear 1993) – the creator of the world told one of his sons, Maasai, to keep livestock, and giving agricultural responsibility to his son Gikuyu (Middleton 1965).

Naturally, the lifestyles of all of these peoples changed drastically during and after European colonization. Colonization broke down centuries-old traditions and failed to implement workable substitutions for these institutions (DuPré 1968). Colonization bound and divided Luo land ownership, an action that hindered farming, halted migration and overpopulated the new national barriers (DuPré 1968). Similarly, Maasai notions of land as a communal territory rather than a singularly owned set of resources was shaken by the reallocation of property by colonial powers (Spear 1993). In a matter of years, the lands that Maasai cattle had grazed for centuries were confiscated, and their cattle introduced to and infected by a new wave of epidemic diseases (Rigby 1992). Individuals and families from all indigenous Kenyan cultural groups were marginalized by British colonization, and

the slum communities that remain today are a reflection of the widespread relocation of indigenous groups to make way for European settlers (Arimah 2010). Many members of these diverse cultural groups were relocated into uniformly inhabitable slums, necessitating significant lifestyle changes. For example, the traditionally nomadic Maasai had to adapt to the confinement and permanence of urban life. The aggregation of distinct and diverse cultural groups into nearly identical living conditions provides a unique opportunity to study lingering cultural traditions and how they affect modern health practices. This study broadly controls for geographic and regional location as well as socioeconomic status, providing the opportunity to focus in on cultural tradition and its role in breastfeeding practices.

Objective

This study aimed to determine what factors, if any, predict suboptimal breastfeeding practices among mothers of four ethnic groups living in urban slum communities near Nairobi, Kenya. Factors examined included ethnic group of origin, maternal employment status, level of familial support, and child's gender. This study also examined the relationship between breastfeeding duration and the focal child's body mass index (BMI), a measure of the ratio between a person's height and weight. While BMI is only one method of determining a child's health, it is a relevant one, particularly in impoverished communities where malnourishment is rampant.

Methods

Participants

Data was collected in the summer of 2012 by a joint team with members from the University of Tennessee – Knoxville, Kenyatta University in Kenya, and The Orphans and Vulnerable Children Project, a Kenyan NGO. 53 focal children were observed in the study from four main cultural groups found in Kenya. The study included 14 Kamba, 11 Kikuyu, 19 Luo, and 9 Maasai children. The child's primary caregiver identified the child's ethnicity. In cases where the mother and father were from a different ethnic group, the child was usually identified with the mother's cultural group, as the mother was predominantly the primary caregiver. Information about breastfeeding practices, mother's occupation, and perceived friend and family support was obtained by interviewing the focal child's mother or primary caregiver. 3 interviewees did not provide information regarding breastfeeding, so these statistics were calculated for 50 focal children, including 13 Kamba, 10 Kikuyu, 18 Luo, and 9 Maasai. Twenty-four of the focal children for whom breastfeeding data was collected were male, while twenty-six were female. All of the families participating in the study lived in a slum community on the outskirts of Nairobi, Kenya.

Data Collection

Focal children were weighed in kilograms wearing light clothing and no shoes, and their heights were measured in centimeters while barefoot and standing. Body Mass Index (BMI) was calculated using the focal child's measured height and weight, and BMI percentile and was found by comparing BMI-for-age to the WHO's child growth standards (WHO & UNICEF, 2009).

The mother's specific occupation was reported during the primary caregiver interview. Three responders indicated that maternal occupation was "Not applicable,"

while three interviewees declined to respond. Twenty-five women self-reported fourteen different occupations, listed as follows: sewing, sewing and midwife, baby care, baby care and community health work, company clerk, sell food or drink, food packer, sell milk and bead products, waitressing, sell milk or bead products and tailoring, garbage collection, community health working and charcoal packaging, shopkeeping, and selling cosmetics in shop. These women were grouped into the “employed” category (n=27). The remaining responders (n=22) self-reported unemployment.

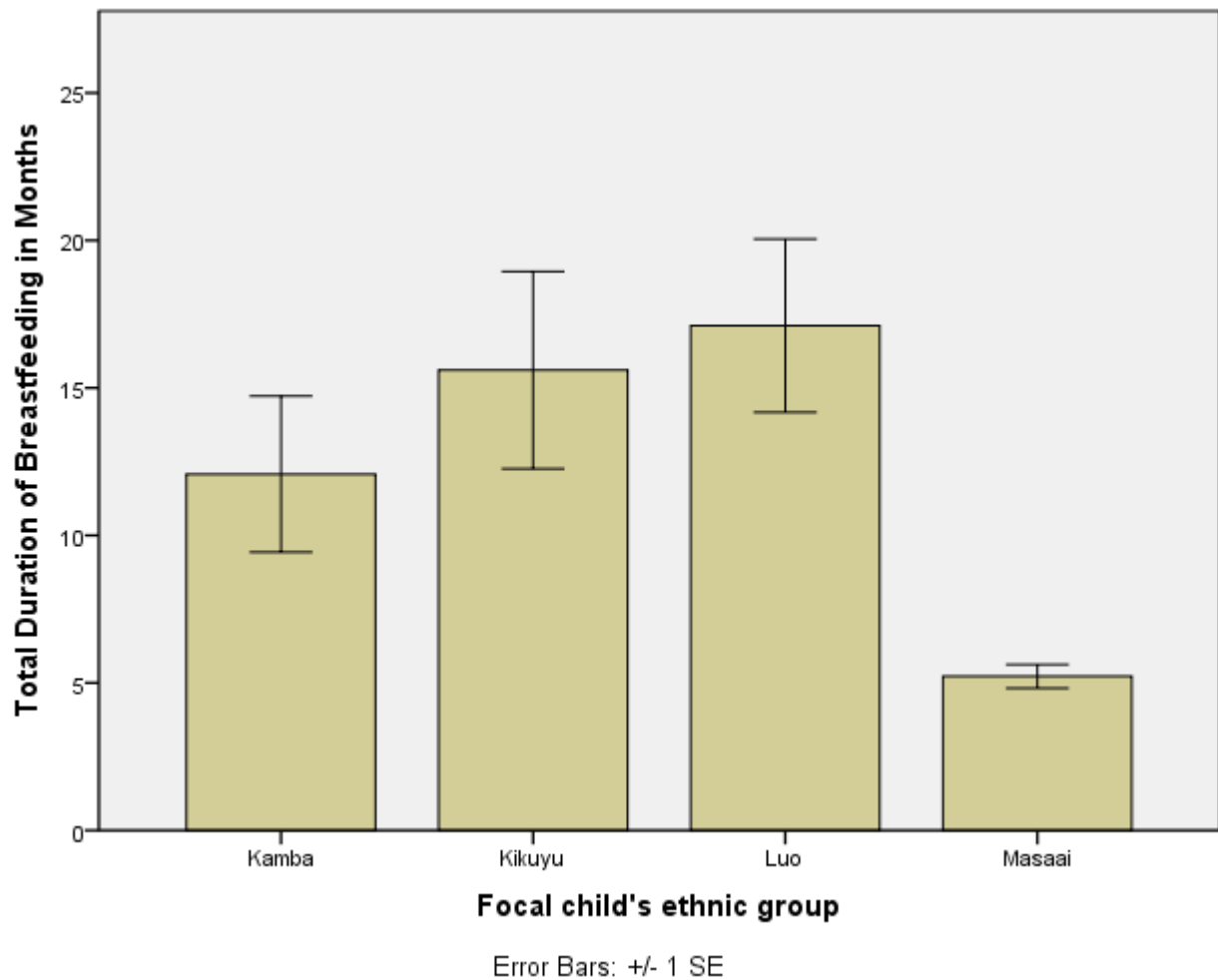
Level of support was determined by running a four-variable K-cluster on the interview questions “Do you receive support from family?” and “Do you receive support from friends?” This resulted in four categories – mothers who receive no help, those who receive help from family but not from friends, those who receive help from friends but not family, and those who receive help from family and friends (n = 23, 3, 12, and 12, respectively). Data was analyzed using a univariate generalized linear model with support cluster as the independent variable and total duration of breastfeeding as the dependent variable. In a secondary analysis, the last three clusters were grouped into a broader category – those receiving support from anyone (n = 27). A 2 x 2 ANOVA was then conducted, this time using absence or presence of any support as the independent variable.

Results

Preliminary analyses examined whether mother’s employment status, levels of social support, and children’s gender predicted variation in breastfeeding duration. ANOVA tests indicated that none of these factors significantly predicted breastfeeding duration.

An ANOVA, with cultural group Kamba, Kikuyu, Luo, and Maasai as the independent variable and breastfeeding duration as the dependent variable, indicated that the cultural group significantly predicted breastfeeding duration ($F[3] = 2.97, p = .04, \eta^2 = .162$). The mean total length of breastfeeding was 12.08 months for the Kamba, 15.60 months for the Kikuyu, 17.11 months for the Luo, and 5.22 months for the Maasai (Figure 1). Pairwise nonparametric t-tests between the individual ethnic groups revealed a significant difference between the Kikuyu and the Maasai ($t(9.26) = 3.08, p = .01$), the Kamba and the Maasai ($t(12.55) = 2.57, p = .02$), and the Luo and the Maasai ($t(17.625) = 4.008, p = .001$). No significant difference in mean duration of breastfeeding was found between the Kikuyu and the Luo, the Kikuyu and the Kamba, or the Kamba and the Luo.

Figure 1: Mean duration of breastfeeding in months by cultural group

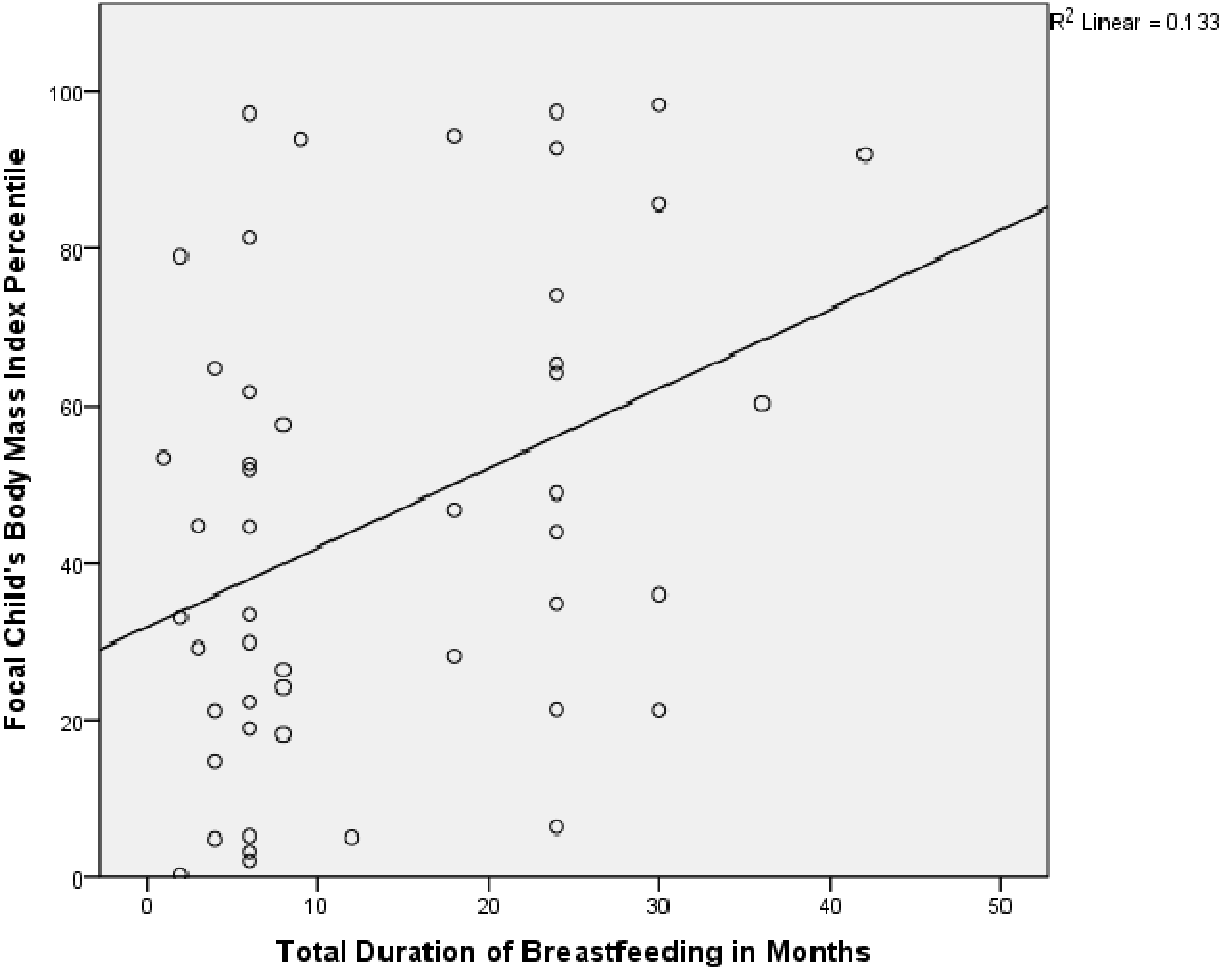


Breastfeeding length-BMI correlation

Pearson's correlation tests examining the relationship between the total length of breastfeeding and focal children's body mass index showed a significant positive correlation ($p=0.009$, $R^2=0.133$) (Figure 2), as did correlations between total length of breastfeeding and focal child's BMI percentile as determined by WHO standards ($p=0.011$, $R^2=0.139$). As an overall trend, longer breastfeeding duration indicated higher BMI. However, despite this correlation's statistical significance, the graph showing the

relationship between total length of breastfeeding and body mass index percentile is very scattered, and the linear fit line has a very low R squared value (0.133).

Figure 2: BMI percentile vs Total Duration of Breastfeeding in Months



Discussion

In this study, cultural group was the primary factor that predicted the length of breastfeeding for each child. When the geographic region and socioeconomic status of the mothers was controlled, maternal occupation, child's gender, and mother's reported level

of support had no significant effect on the length of breastfeeding. However, the data did indicate that Maasai mothers living in slum communities in Nairobi breastfed their children for a significantly shorter duration than mothers from the Kamba, Kikuyu, and Luo ethnic groups.

Though the women in this study now all live in urban settings, Maasai pastoralist traditions of cattle herding may have lingering effects on their feeding practices. As cattle are a key element in the economy and traditions of the Maasai, cow's milk has long been a staple in the Maasai diet (Nestel 1986). Even in the slum community, many of the Maasai still kept cattle and made their living using their livestock. However, bovine milk is not an equal substitute for human breastmilk, lacking required mineral balances of iron, vitamin E, sodium, and potassium, and containing protein and fatty acids that are harder for a child to digest (Heinig 2001, Hanson 2002). For these reasons, breastmilk should not be supplemented by other food sources until the child is at least six months old.

Though it was hypothesized that the mother's occupational status, the child's gender, or the mother's level of social support may have affected breastfeeding duration, this was unsupported by the data. In studies conducted in first world countries, working mothers terminate exclusive breastfeeding earlier than unworking mothers, likely because of time spent away from the baby (Simard 2005). However, this pattern was not seen in the Kenyan study, possibly because even many working mothers worked from home or in child-care or some other setting in which the baby's presence would not disrupt work.

It was also hypothesized that the child's gender could impact how long the mother decides to breastfeed, as in a 2011 study by Kimani-Murage. Thankfully, this was not the

case in the Kenyan study. This pattern is likely seen more often in cultures that value sons over daughters, and was not evident among any of the Kenyan cultural groups in this study.

The third variable assessed that did not significantly predict breastfeeding duration was the mother's level of social support. This variable was self-reported and thus may have been interpreted differently by the different interviewees. Furthermore, the presence or absence of social support does not necessarily correlate to the quality of support. A mother whose family is present to care for the baby or who receives uneducated or faulty advice could actually be more likely to wean her baby before the recommended age.

Breastfeeding education and promotion is an ongoing and crucial process. While home deliveries and cultural traditions surrounding the birthing process remain, more and more women worldwide are delivering their babies in hospitals. Thus, health care workers can have a significant impact on a mother's feeding practices, provided they are perceived as knowledgeable and trustworthy guides. In light of these findings, it is advisable to take cultural context into account when educating mothers about proper infant feeding. Even if social health workers possess ample knowledge and understanding regarding breastfeeding, their advice is useless if not applied appropriately (Bradley 1992). To implement better feeding practices across a wide range of mothers, advisors should adapt their instruction to respect cultural traditions while still emphasizing breastfeeding's importance. By involving a diverse group of community leaders in the education process, breastfeeding advocates can be better assured of trustworthy and culturally sensitive training.

References

- Alwy, A. & Schech, S.B. (2004). Ethnic Inequalities in Education in Kenya. *International Education Journal*, 5(2), 266-274.
- American Academy of Pediatrics. (1997). Policy Statement: Breastfeeding and the use of human milk (RE9729). *Pediatrics*, 100, 1035–1039.*****
- Anderson, J., Johnstone, B., & Remley, D. (1999). Breast-feeding and cognitive development: A meta-analysis. *American Journal of Clinical Nutrition*, 70, 525-535.
- Arimah, B. (2010). The face of urban poverty: Explaining the prevalence of slums in developing countries. Working paper. *World Institute for Development Economics Research*, No. 2010, 30.
- Bradley, J. E. (1992). Breastfeeding Promotion in Kenya: Changes in Health Worker Knowledge, Attitudes and Practices, 1982–89. *Journal of Tropical Pediatrics*, 38(5), 228-234.
- Bulatao, R.A. (1983). *Determinants of Fertility in Developing Countries: A summary of knowledge*. Washington DC: National Academy Press.
- Celi, A. C. (2005). Immigration, Race/Ethnicity, and Social and Economic Factors as Predictors of Breastfeeding Initiation. *Archives of Pediatrics and Adolescent Medicine*, 159(3), 255-60.
- Clemens, J.D. (1986). Breastfeeding as a determinant of severity in shigellosis: Evidence for protection throughout the first three years of life in Bangladeshi children. *American Journal of Epidemiology*, 123, 710–720.
- Cochi S.L., Fleming, D.W., Hightower, A.W., et al. (1986). Primary invasive *Haemophilus influenzae* type b disease: A population-based assessment of risk factors. *Journal of Pediatrics*. 108, 887–896.
- Cohen, A. (1974). *Urban Ethnicity*. London: Tavistock Publications.
- Coovadia, H.M., Rollins, N.C., Bland R.M., Little, K., Coutsooudis, A., Bennish, M.L. & Newell, M.L. (2007). Mother-to-child transmission of HIV-1 infection during exclusive breastfeeding in the first 6 months of life: an intervention cohort study. *The Lancet*, 369, 1107-1116. DOI:10.1016/S0140-6736(07)60283-9
- Duncan B., Ey, J., Holberg C.J., et al. (1993). Exclusive breast-feeding for at least 4 months protects against otitis media. *Pediatrics*, 91, 867–872.

- DuPré, C.E. (1968). *The Luo of Kenya*. Washington, D.C.: Institute for Cross-Cultural Research.
- Espinoza, F., Paniagua, M., Hallander, H. *et al.* (1997). Rotavirus infections in young Nicaraguan children *Pediatric Infectious Disease Journal*, 16, 564–571.
- Fjeld, E., Siziya, S., Katepa-Bwalya, M., Kankasa, C., Moland, K.M., & Tylleskar, T. (2008). 'No Sister, the Breast Alone Is Not Enough for My Baby' A Qualitative Assessment of Potentials and Barriers in the Promotion of Exclusive Breastfeeding in Southern Zambia. *International Breastfeeding Journal* 3(1), 26.
- Ford, R., Taylor, B., Mitchell, E., Enright, S., Stewart, A., Becroft, D., *et al.* (1993). Breastfeeding and the risk of sudden infant death syndrome. *International Journal of Epidemiology*, 22, 885–890.
- Grossman, L.K., Fitzsimmons, S.M., Larsen-Alexander, J.B., Sachs, L., & Harter, C. (1990). The infant feeding decision in low and upper income women. *Clinical Pediatrics*, 29, 30-37.
- Hanson, L., & Korotkova, M. (2002). The Role of Breastfeeding in Prevention of Neonatal Infection. *Seminars in Neonatology*, 7(4), 275-281.
- Hodgson, D.L. (2001). *Once intrepid warriors: gender, ethnicity, and the cultural politics of Maasai development*. Bloomington: Indiana University Press.
- Long, K., Vasquez-Garibay, E., Mathewson, J. *et al.* (1999). The impact of infant feeding patterns on infection and diarrheal disease due to enterotoxigenic *Escherichia coli*. *Salud Publica Mexico*, 41, 263–270.
- Heinig, M.J. (2001). Host Defense Benefits of Breastfeeding for the Infant: Effect of Breastfeeding Duration and Exclusivity. *Pediatric Clinics of North America*, 48(1), 105-123.
- Kaplan, I. (1984). *Kenya, a country study*. Washington, DC: Foreign Area Studies, American University.
- Parliament of Kenya. (2012) Breast milk Substitutes (Regulation and Control) Act. Nairobi, Kenya.
- Kimani-Murage, E.W. (2011). Patterns and Determinants of Breastfeeding and Complementary Feeding Practices in Urban Informal Settlements, Nairobi Kenya. *BMC Public Health*, 11, 395.
- KNBS, (2010). *Kenya DHS, 2008-09 - Final Report (English)*. Nairobi, Kenya and MEASURE DHS, ICF Macro, Calverton, Maryland, USA.FR229.

KNBS. (2010). Kenya National Bureau of Statistics. *Economic Survey*. Nairobi: Government Printer.

Knodel, J., & Debavalya, N. (1980). Breastfeeding in Thailand: Trends and differentials 1969-79. *Studies in Family Planning*, 11, 355-377.

Koletzko, S., Griffith, S., Corey, M., Smith, C., & Sherman, P. (1991). Infant feeding practices and ulcerative colitis in children. *British Medical Journal*, 302, 1580-1581.

Kramer, M.S. & Kakuma, R. (2002). Optimal duration of exclusive breastfeeding. *Cochrane Database of Systematic Reviews*, 1, CD003517. DOI: 10.1002/14651858.CD003517.

Mabilia, M. (2005). *Breast Feeding and Sexuality: Behaviour, Beliefs, and Taboos among the Gogo Mothers in Tanzania*. New York: Berghahn.

Nestel, P. & Geissler, C. (1986). Potential deficiencies of a pastoral diet: A case study of the Maasai. *Ecology of Food and Nutrition*, 19(1), 1-10.

Oddy, W., Holt, P., Sly, P., Read, A., Landau, L., Stanley, F., et al. (1999). Association between breast feeding and asthma in 6 year old children: Findings of a prospective birth cohort study. *British Medical Journal*, 319, 815-819.

Ogot, B. A. (1967). *History of the Southern Luo: Volume I, Migration and Settlement, 1500-1900*, (Series: *Peoples of East Africa*). Nairobi: East African Publishing House.

Phinney, J. S. (1996). When we talk about American ethnic groups what do we mean? *American Psychologist*, 51, 918-927.

Popkin B. M., Adair, L., Akin, J.S., et al. (1990). Breast-feeding and diarrheal morbidity. *Pediatrics*, 86, 874-882.

Ravallion, M. & Chen, S. (2008). *Dollar A Day Revisited*. Washington, D.C.: The World Bank.

Rigby, P. (1992). *Cattle, Capitalism, and Class: Iparakuyo Maasai Transformations*. Philadelphia: Temple UP.

Shah, S., Rollins, N.C., Bland, R. (2005). Breastfeeding knowledge among health workers in rural South Africa. *Journal of Tropical Pediatrics*, 51(1), 33-38.

Sibeko, L. (2005). Beliefs, Attitudes, and Practices of Breastfeeding Mothers From a Periurban Community in South Africa. *Journal of Human Lactation*, 21.1, 31-38.

Siegel, C., Davidson, A., Kafadar, K., Norris, J. M., Todd, J., et al. (1997). Geographic analysis of pertussis infection in an urban area: A tool for health services planning. *American Journal of Public Health*, 87, 2022–2026.

Simard, I. (2005). "Factors Influencing the Initiation and Duration of Breastfeeding Among Low-Income Women Followed by the Canada Prenatal Nutrition Program in 4 Regions of Quebec." *Journal of Human Lactation*, 21(3), 327-337.

Shu, X-O., Clemens, J., Zheng, W., Ying, D., Ji, B., & Jim, F. (1995). Infant breastfeeding and the risk of childhood lymphoma and leukaemia. *International Journal of Epidemiology*, 24, 27–32.

Shu, X., Linet, M., Steinbuch, M., Wen, W., Buckley, J., Neglia, J., et al. (1999). Breast-feeding and risk of childhood acute leukemia. *Journal of the National Cancer Institute*, 91, 1765–1772.

Spear, T. & Waller, R. (1993). *Being Maasai: Ethnicity and Identity in East Africa*. London: Villiers Publications.

Tabutin, D. & Akoto, E. (1992). Socio-economic and cultural differentials in the mortality of sub-Saharan Africa. In E. van de Walle et al. (eds), *Mortality and Society in Sub-Saharan Africa*. Oxford: Clarendon Press.

UNICEF. (2009). *Diarrhoea: Why Children Are Still Dying and What Can Be Done*. New York, United Nations Children's Fund.

UN-HABITAT (2002). Defining slums: Towards an operational definition for measuring slums. Background Paper 2, Expert Group Meeting on Slum Indicators, October. Nairobi, United Nations.

Utoo, B. T., Ochejele, S., Obulu, M. A., & Utoo, P. M. (2012). Breastfeeding Knowledge and Attitudes amongst Health Workers in a Health Care Facility in South-South Nigeria: the Need for Middle Level Health Manpower Development. *Clinics in Mother and Child Health*, 9, Article ID 235565.

Van Landingham, M. (1991). Contraceptive and Health Benefits of Breastfeeding: A Review of the Recent Evidence. *International Family Planning Perspectives*, 17(4), 131-136.

Von Braun, J. (1993). *Urban Food Insecurity and Malnutrition in Developing Countries: Trends, Policies, and Research Implications*. Washington, DC: International Food Policy Research Institute.

Walterspiel, J. N., Morrow, A. L., Guerrero, M. L. *et al.* (1994). Secretory anti-*Giardia lamblia* antibodies in human milk: protective effect against diarrhea. *Pediatrics*, 93, 28–31.

World Health Organization. (2002), *Global Strategy on Infant and Young Child Feeding*. A55/15. Accessed 1 Feb. 2013.

World Health Organization. (2003), *Emerging issues in water and infectious disease*. Accessed 19 April 2013.

World Health Organization and United Nations Children's Fund. (2009). WHO child growth standards and the identification of severe acute malnutrition in infants and children: A Joint Statement by the World Health Organization and the United Nations Children's Fund. Geneva, WHO.