Health and Disease Symptomology in Luo Children

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Abstract

**Objectives:** This paper examines the impact of orphanhood on the health of Kenyan Luo children through the use of a clinical history and physical exam. Orphans were hypothesized to have poorer health than non-orphans; differences were expected in both males and females.

**Methods:** Four hundred eleven Luo children (9±1 yr), residing in western Kenya were recruited to participate in a cross-sectional study examining health via a structured clinical history and physical exam.

**Results:** Using a t-test as the method of analysis, no significant differences in the clinical history and physical exam were found between the two groups of male children or the two groups of female children.

**Discussion:** Results from this study suggest that Luo children would benefit from health education as well as prevention and treatment for parasitic and fungal infections.

Introduction

The HIV/AIDS pandemic is creating a generation of orphaned children in Africa. The continent of Africa is home to 95% of the world’s children who have lost one or both parents to AIDS (Human Rights Watch 2001; Matshalaga 2002:324). It is estimated that by the year 2010, approximately 18 million African children under 18 years of age will be orphaned as a result of the pandemic (UNICEF 2005). According to a report by UNAIDS (2006), the HIV/AIDS pandemic has not peaked so the extent of the orphan crisis has yet to be fully realized. The number of HIV/AIDS orphans will continue to increase long after the crisis peaks so it is important to determine how best to aid these children to ensure that they are healthy and well-nourished.

In addition to the risk of becoming orphaned, the World Health Organization (2006) reports that a child born today in Africa may face more health risks throughout his life than a child born on any other continent. This high risk of poor health may be the result of several factors, including both the high HIV/AIDS prevalence on the continent and the rates of poverty (World Health Organization 2006). Currently, the leading causes of death among African children 5-14 years old are lower respiratory tract infections, HIV/AIDS, traffic accidents, measles, and trypanosomiasis (African sleeping sickness) (World Health
Organization 2006). Furthermore, many Africans do not have access to adequate healthcare.

Child health in Nyanza Province, the site of data collection, is considered to be poor. For children under the age of 5 years, causes of morbidity and mortality in the region are consistent with those seen across Kenya: malaria, diarrhea, measles, malnutrition, and respiratory, parasitic, and skin infections (Central Bureau of Statistics 2003; Kenyan Ministry of Health 2004). Although both infant mortality and under-5 child mortality rates are extremely high in Nyanza Province (Kenyan Ministry of Health 2004), over 50% of the families surveyed in the Kenyan Demographic and Health Survey 2003 reported seeking healthcare for child illness (Central Bureau of Statistics 2003).

Although not well studied, several means exist through which orphanhood could impact child health. Orphans often live in poor socioeconomic homes where there may be a lack of food, education, and clothing (Kenyan Ministry of Health 2004). Orphaned children who are living in households in which one or more persons are infected with HIV/AIDS will be exposed and potentially infected with more diseases than children living in non-AIDS affected homes. Length of disease episodes was found to be longer in those children living in homes where someone was infected with HIV/AIDS (Bridge et al. 2006:74). It is possible that children living with grandparents may suffer from poorer health as elderly people are more susceptible to many infectious diseases. These children may be exposed to disease more often. Furthermore, children living with an elderly caregiver may not receive adequate healthcare if the elder does not have the resources to pay for a physician and pharmacy visit.

Several researchers have found orphans to have poorer health than non-orphans. In one study, orphan self-reported morbidity per parent/guardian of diarrhea, fever, and cough was higher than that of non-orphans (Sarker, Neckerman, and Muller 2005:10). Results may have occurred because the children involved in this study were younger (12-59 months) than the children who were recruited to participate in the present study. Despite the difference seen in illness prevalence, no differences were found in treatment seeking behavior between the two groups of parents (Sarker, Neckerman, and Muller 2005:10). Lack of difference in treatment seeking behavior suggests that although orphans are reported to be sicker more often, their caregivers may have the ability to meet their healthcare needs. A study investigating children in Zimbabwe found poor health to exist in orphans (Watts et al. 2007:12). In Zimbabwe, orphans and other vulnerable children were more likely to have reported recent episodes of diarrhea or respiratory tract infections (Watts et al. 2007:12). Similar to the previously discussed study, these results were found to occur in children less than 5 years of age. Therefore, as discussed above, it is possible that the difference in health could be due to the young age of the children studied.

On the other hand, many studies investigating the impact of orphanhood on health have failed to find a relationship between orphan status and poor health. These studies have not found a correlation between the morbidity and/or mortality of children who have been orphaned by HIV/AIDS and those who have not (Crampin et al. 2003:17; Kamali et al. 1996:8; Parikh et al. 2007:21; Ryder et al. 1994:8). A study in western Kenya found no significant difference between a recent history of fever or malaria between orphans and non-orphans (Lindblade et al. 2003:8). No difference was found in the
incidence of disease between orphans and nonorphans living in Uganda (Bridge et al. 2006:74).

This paper aims to add to knowledge regarding orphan health through several means. A more comprehensive approach to child health will be taken in this paper. Clinical histories and physical exams will allow for an investigation of overall health as well as commonly reported disease symptoms. Males and females will be investigated separately, which will allow for the investigation of health to be gender specific. Finally, length of orphanhood will also be investigated as a covariate to determine its impact on orphan health. This paper examines the impact of orphanhood on the health of Luo children through the use of a clinical history and physical exam. Specifically, orphans were hypothesized to have poorer health as determined by a clinical history and physical exam than non-orphans. The differences were expected in both males and females.

Methods

Study Population

This project was conducted in Nyanza Province, Kenya from June-July 2007. With a 6.1% HIV/AIDS prevalence rate among adults aged 15-49 years, Kenya is the 17th hardest hit country in Africa (UNAIDS 2006). Approximately 1.1 million orphans live in Kenya (UNAIDS 2006). A large majority of these children are currently living in Nyanza Province, where 30-39% of adults are infected with HIV (UNAIDS 2006). This prevalence rate is one of the highest on the continent of Africa (UNAIDS 2006). In Nyanza Province, it is estimated that 19% of children less than 15 years of age have lost one or both parents to AIDS (United Nations 2005). The primary residents of Nyanza Province, the Luo, are members of the third largest ethnic group in Kenya (National Council for Population and Development 1999).

Sample

Four hundred eleven children (age 9±1 yr) were recruited from 17 schools in the Nyando District and Kisumu Rural. Both Nyando District and Kisumu Rural are located within Nyanza Province and were chosen because of current affiliations that Ohio University College of Osteopathic Medicine has with community leaders in the area. The headmaster at each school was contacted and asked to select male and female children that could participate in the study. It is unknown as to what criteria the headmaster used to select study participants nor if the children selected were representative of the school’s student body. Approximately half of the children invited to participate in the study were orphans and half were non-orphans. An orphan was defined as a child who had lost at least one parent to AIDS or another cause. This definition of orphanhood is consistent with that accepted internationally as well as locally in Kenya (Nyambdena, Wandibba, and Aagaard-Hansen 2003:57). Consent for participation in the study was obtained from a parent/guardian and assent was obtained from the children in accordance with Ohio University’s Institutional Review Board and the Kenya Medical Research Institute. Consent and assent were obtained in Dholuo. Approval has been granted for this research by Ohio University's Institutional Review Board, and Kenya Medical Research Institute’s scientific and ethics committees. Orphans and non-orphans were frequency-matched for age and gender. Selected sample characteristics are displayed in Table 1.
Table 1

Sample characteristics, Mean(SD) or %

<table>
<thead>
<tr>
<th>Variable</th>
<th>Orphan</th>
<th>Nonorphan</th>
<th>Total</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N=210</td>
<td>N=197</td>
<td>N=407</td>
<td></td>
</tr>
<tr>
<td>Age (years)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>9.5(1.2)</td>
<td>9.2(1.4)</td>
<td>9.3(1.3)</td>
<td>0.2</td>
</tr>
<tr>
<td>Female</td>
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<td>8.9(1.3)</td>
<td>9.1(1.2)</td>
<td>0.1</td>
</tr>
<tr>
<td>Gender (%)</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>57.6</td>
<td></td>
<td>45.7</td>
<td>46.7</td>
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<tr>
<td>Female</td>
<td>52.4</td>
<td></td>
<td>54.3</td>
<td>53.3</td>
</tr>
<tr>
<td>Height (cm)</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>134.2(8.0)</td>
<td>133.5(9.4)</td>
<td>133.9(8.6)</td>
<td>0.6</td>
</tr>
<tr>
<td>Female</td>
<td>134.3(9.5)</td>
<td>132.1(8.6)</td>
<td>133.2(9.1)</td>
<td>0.1</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Male</td>
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<td></td>
<td>28.1(4.5)</td>
<td>28.3(4.7)</td>
</tr>
<tr>
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<td></td>
<td>26.9(4.9)</td>
<td>27.6(5.4)</td>
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<tr>
<td>Body Mass Index</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>15.9(2.7)</td>
<td></td>
<td>15.7(1.4)</td>
<td>15.8(2.2)</td>
</tr>
<tr>
<td>Female</td>
<td>15.5(1.5)</td>
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<td>15.3(1.5)</td>
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<tr>
<td>Length of orphanhood (years)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>4.6(2.4)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>4.6(2.3)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Inclusion/Exclusion Criteria

Children between ages 7-11 years and residents of Nyando District or Kisumu Rural were included in the study.

A child was excluded from the study if after the clinical history and physical exam he was thought to be potentially infected with HIV/AIDS. These children were referred to a local clinic per the recommendation of the clinical officer. This exclusion criterion is part of the study because this paper is part of a larger research project investigating the impact of orphanhood on Luo children. One aspect of this research investigated child nutritional status, which would be impacted by HIV/AIDS infection. Similarly HIV/AIDS can affect health because treatment for this disease not readily available or affordable to most Luo. HIV/AIDS children were excluded to prevent any bias.

Data Collection Methods

Clinical History and Physical Exam

The questions asked in the both the clinical history and the physical examination were determined with the help of an American Osteopathic pediatrician. Evaluation of health is equivalent to that performed with an American child of similar ages.

A clinical history was obtained for each study participant by an Osteopathic medical student and a local research assistant. Each child also participated in a physical exam performed by an Osteopathic medical student and a local clinical officer. The training that a Kenyan clinical officer receives is equivalent to that of an American physician’s assistant. Two groups of medical students and clinical officers performed the exams. Examiners were blinded to orphan status. Both sets of examiners performed the same physical exam in the same order. The clinical history and physical exam were not oriented to be nutritionally focused.

The clinical history and physical exam investigated the following systems: cardiovascular, respiratory, eyes/ears/nose and throat, gastrointestinal, urinary, musculoskeletal, endocrine, neurological and integumentary (skin). For example, during the nose portion of the clinical history children were asked if they had recently experienced a runny nose or stuffy nose. When the respiratory system was being examined during the physical exam, lungs were auscultated to identify potential pathologies, i.e. wheezing (indicative of asthma) or rales (indicative of pneumonia). In addition to providing general health information, the clinical history and physical exam were also utilized to identify children potentially infected with HIV/AIDS. The “Revised World Health Organization Clinical Staging of HIV/AIDS for Infants and Children under 15 Years” was used to identify potentially infected children (World Health Organization 2005).

To prevent stigmatization, the clinical history and physical exam were conducted in private areas within the research site (typically a church or school). All information obtained during the clinical history and physical exam was kept confidential and was only available to the principal investigator and the Osteopathic medical student and the research assistant/clinical officer who performed the history/exam.
Abnormal (pathological) findings in the clinical history and physical exam were recorded. For example, in the clinical exam, complaints of nausea, vomiting, and/or diarrhea were recorded as abnormal findings for the gastrointestinal system. A rash or fungal infection observed during the physical exam was reported as an abnormal finding for the integumentary system. Data were entered in PalmPilots® using Entryware® software. Each abnormal finding was recorded and a system was considered to be abnormal if at least one pathological finding was reported per system. The number of abnormal systems was summed for analysis. A total of 9 systems were investigated during the clinical history and the physical exam, therefore the number of abnormal systems could range from 0-9. The same process was repeated for clinical history and the physical exam. A similar analysis has occurred in recently published work investigating Luo elders (Author 2008:23).

**Interview**

Participant interviews were conducted in Dholuo by a trained Luo research assistant. Orphans were also asked how many years they had been orphans. Non-orphans were asked if and how many orphans lived in their homestead. Data were entered in PalmPilots® using Entryware® software.

**Analysis**

Prior to analysis, four children were excluded from the study: two children were excluded because of questionable HIV status; one child was excluded because age was undeterminable; the last child was excluded for both factors, leaving 407 children in the analysis.

The clinical history and physical exam scores were compared between orphans and non-orphans using a t-test. Using confidence intervals of 95%, a p-value of p≤0.05 was considered indicative for a significant correlation. The clinical history and physical exam were analyzed separately so the difference between subjective and objective findings could be investigated. Male and female children were analyzed separately.

In order to determine if an association existed between the clinical history and physical exams scores, and length of orphanhood, a partial correlation analysis was used. Age was entered as a control variable in this analysis because of the relationship that exists between the age of the child and his length of orphanhood. The analysis was run separately for male and female orphans. Alpha=0.05 indicated a significant association. All analyses were performed using SPSS 15.0® statistical software.

**Results**

No significant differences were detected between the two groups of males for the clinical history and physical exam (Table 2). Similarly, there was no significant difference for the clinical history and the physical exam between the two groups of females (Table 3).

### Table 2

**Health measures for males**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Orphan</th>
<th>Nonorphan</th>
<th>p-value</th>
</tr>
</thead>
</table>

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Common complaints emerged during both the clinical history and physical exam for males and females regardless of orphan status. Male children often reported symptoms that could be due to a viral infection or the common cold. They reported having a cough (72.6%), sore throat (61.1%), runny nose (74.2%), stuffy nose (74.7%), and red eyes (75.8%). Two gastrointestinal complaints, diarrhea (54.7%) and abdominal pain (77.4%), were often reported by male children. Male children also reported suffering from dry skin (70.5%) and a rash (55.8%). Female children also reported many findings representative of a cold. They reported suffering from a cough (76.3%), sore throat (66.5%), runny nose (80.5%), stuffy nose (82.8%), and red eyes (71.6%). Abdominal pain (76.7%) and dry skin (50.2%) were also reported by females. Neurological complaints were common complaints mentioned by the female children. They reported that they were acting differently (50.7%), crying (56.7%), sleeping more (65.1%), and were often inconsolable (54.9%). Headaches (54.0%) were another common complaint from the females.

The physical exam yielded several common findings. Lymphadenopathy (swollen lymph nodes) was common finding among both groups of male (74.60%) and female children (77.21%). Rashes were also commonly seen in all children. Most rashes were described by examiners as being either dry or crusted.

Partial correlations indicated that there is no relationship between the clinical history and physical exam scores, and length of orphanhood. This was true for both males and females.

**Discussion**

The data presented here suggest that no difference exists between the health of orphaned and non-orphaned Luo children. Furthermore, no association was found between length of orphanhood, and the clinical history and physical exam scores. These results support much of the current orphan literature which suggests that there is no difference between the health of orphans and nonorphans (Bridge et al. 1996:74; Lindblade et al. 2003:8; Parikh et al. 2007:21; Ryder et al. 1994:8).

Cough, sore throat, nasal congestion, watery eyes, and abdominal pain were symptoms often reported by both males and females regardless of status. These complaints are similar to those reported by the Kenyan Ministry of Health (2004) as being common in Kenyan children. A study investigating the self-treatment of adolescent children found the most commonly reported complaints to be cold, abdominal issues, injuries, and headache (Geissler et al. 2000:50). Many of the complaints reported by the children in the present study may have been symptoms of a “cold.” Abdominal issues were also a common complaint in the present study sample. Other subjective complaints among the females included acting differently, crying, and sleeping more. They also reported feeling inconsolable as well as having headaches. The females were not questioned in depth concerning these complaints, however, it is possible that these symptoms could be the
result of depression. Male and female children also reported having a rash, most often described as being dry or crusted. Overall, many of the subjective complaints made by the Luo children who participated in this project are very similar to those often seen in American pediatrics clinics.

Fungal and parasitic infections were the most common findings in the physical exam. Tinea infection was frequently reported by examiners. When present on the torso and extremity, tinea can appear to be dry skin, which was a commonly reported subjective complaint of both male and female children. Parasitic infestation was also seen in many children. The Kenyan Ministry of Health (2004) reported that the occurrence of parasitic and fungal infections in children is high. All children who participated in this study were treated with mebendazole (100mg), an anti-worm agent. Lymphadenopathy or swollen lymph nodes were commonly noted by examiners during the physical exam. Swollen lymph nodes commonly represent previous or current infection. Therefore it is probable that many of the children who participated in this study may have been recovering from an illness. No other physical exam findings were commonly identified in this sample of Luo children.

The children in this study, regardless of orphan status, were healthier than expected. Several reasons could account for the unexpected results obtained in this study. One study investigating the health of Luo schoolchildren suggested that illnesses were frequently experienced by the study participants, however, self-treatment was prevalent among these children (Geissler et al. 2000:50). Treatments reported by children were herbal remedies or the purchase of pharmaceuticals (Geissler et al. 2000:50). Dealing with illness was thought to be an “adaptive skill” as opposed to an event that would hinder their daily routine (Geissler et al. 2000:50). It is possible that the Luo children in this study are employing similar means of treatment. Similarly, it is also possible that illness is a part of life for Luo children they have adapted to live with.

Some literature suggests that grandparents may not have the ability to provide adequate care for their orphaned grandchildren (Nyambeda, Wandibba, and Aagaard-Hansen 2001:38; UNICEF 2003). The present study suggests that elderly caregivers and the extended family do have that ability. Results from several studies in Africa indicate that the extended family is capable of providing adequate care for orphans (Crampin et al. 2003:17; Sarker, Neckerman, and Muller 2005:10; Ryder et al. 1994:8). It is possible that the orphans in this study are living in high socioeconomic status homesteads, which has been reported to be a common characteristic of the homes where orphans live (Bicego, Rutstein, and Johnson 2003:56; Parikh et al. 2007:21). The fact that all children in the study were in school supports the theory that they came from homes with high socioeconomic statuses. Older children may also be working to help provide a household income or means for adequate healthcare.

The limitations of this study must be acknowledged. The current study is cross-sectional and therefore does not yield information about the long term effects of orphanhood on children. Age determination was difficult to assess in this study as birth records are not normally kept in Luo society, which means that children outside of the study’s desired age range may have been included. It is important to recognize that these results cannot be generalized to all Kenyan children as the children in the study were mainly Luo. The results should also be interpreted carefully within the Luo community itself because only children from two districts within Nyanza Province were recruited for
participation in the study. It is possible that the headmaster at each school may have created a bias as it is unknown as to the criteria he used to select study participants. Since children were recruited from schools, it is not possible to generalize these results to orphans, as many times orphans are forced to drop out of school to perform household chores, care for sick family members and/or work. As previously mentioned, it is highly probably that these children live in homes with a higher socioeconomic status than the general population because they are all attending school. These children and their family members may be more likely to be taken to a clinic and receive treatment because they have the money for healthcare. Although the clinical history was carefully translated by a native speaker of Dholuo, it is possible that many of the children had difficulty with understanding the questions being asked about their health. The overall assessment of health was subjective and it is possible that physical exam results would differ between clinical officers.

Furthermore, since this was a pilot study other confounding factors that could impact health were not investigated. As mentioned above, socioeconomic status is one such factor. Others include sex of guardian as well as guardian age. Future studies will further investigate these and other potential confounding factors.

Despite the limitations this study presents, it adds to the already existing literature investigating orphanhood and its impact on the health of children. The majority of literature investigating orphan health suggests that there is not a strong correlation between orphan status and health. The present study supports this idea. The age range investigated in this research is different from that in much of the current literature, thus this project increases knowledge about the impact of orphanhood on older children. Furthermore, the sample size in this study exceeds that of many current studies looking at orphans. Additionally, this study utilized a clinical history and a physical exam allowing for a more comprehensive look at health.

Results from this study indicate that the health of orphans is similar to the health of non-orphans. The majority of children were diagnosed as suffering from parasitic infections. Health interventions targeted at this age group should include health education, i.e., strategies to clean water, and ways to improve hygiene. When considering findings from the physical exam, education on fungal, parasite, and malaria prevention and treatment would be beneficial for this population. Access to healthcare should also be improved and made more cost effective to ensure that children living in the most interior of the rural areas are also able to obtain preventative education and treatment.

**Acknowledgements**

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Table 3  

*Health measures for females*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Orphan</th>
<th>Nonorphan</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N  Mean(SD)</td>
<td>N  Mean(SD)</td>
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</tr>
<tr>
<td>Clinical history</td>
<td>110  5.8(1.2)</td>
<td>105  6.0(1.2)</td>
<td>0.9</td>
</tr>
<tr>
<td>Physical exam</td>
<td>109  2.0(1.3)</td>
<td>106  2.3(1.3)</td>
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References


