SA Journal of Child Health

ARTICLE

Using community-based interventions to improve disease prevention practices of caregivers of under-5s in Ile-Ife, south-western Nigeria

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Objectives. To compare caregivers' knowledge and practice of key disease prevention household and community practices in two local government areas (LGAs), in one of which Community-Integrated Management of Childhood Illness (C-IMCI) had been implemented.

Design. A cross-sectional design.

Setting. Osun State, Nigeria, between August and September 2007.

Subjects. Mothers or caregivers of children 0 - 59 months of age and their index children.

Results. The IMCI key disease prevention practices were generally better applied in the C-IMCI-compliant LGA than in the non-compliant LGA. Significant differences were observed in the proportion of caregivers who would wash their hands with soap after using the toilet (p=0.0445), after attending to a child who has passed stool (p=0.000), before feeding a child (p=0.000), before preparing food (p=0.000), and before eating (p=0.0385).

More caregivers from the compliant than the non-compliant LGA had ever used a method to prevent malaria. More than a quarter of caregivers from the non-compliant LGA did not use any method to prevent malaria.

More caregivers from the non-compliant LGA showed deficiencies in their knowledge base of HIV/AIDS infection. Knowledge was particularly poor with respect to mother-to-child transmission of HIV. Only 39% of caregivers from the non-compliant LGA believed that a child can be infected with HIV/AIDS.

Under-5 mortality has remained very high in sub-Saharan Africa despite enormous investments in health system reforms and several vertical programmes.[1] Of the almost 11 million deaths of children before their fifth birthday in low- and middle-income countries each year,[2] half are due to just five conditions: malaria, pneumonia, diarrhoea, measles and HIV, often in combination.[3] Malnutrition contributes to over 60% of these deaths.[4] The Integrated Management of Childhood Illness (IMCI) is a strategy developed by the World Health Organization (WHO), the United Nations Children's Fund (UNICEF) and other technical partners[1,5,6] that seeks to address these problems through three components – improved case-management, improved health systems support, and improved family and community practices, also known as Community-IMCI (C-IMCI). Since families have the major responsibility of caring for their children, success in reducing childhood mortality and in promoting optimal growth and development of children requires a partnership between health workers and families with support from their communities to ensure improved health practices for child care at home, timely recognition and prompt care seeking when the child is sick, and compliance with treatment.[7,8]

Nigeria commenced implementation of the IMCI strategy in 1997, initially in six local government areas (LGAs) in one each of the six geopolitical zones.[9] Community resource persons (CORPs) were trained to provide caregivers with information on key practices and ensure that they adopted these practices.

This study describes differences in key disease prevention practices of households and communities between a C-IMCI-compliant LGA (Ife Central) and an LGA in which C-IMCI had not been implemented (Ife North), both in Osun State, south-western Nigeria. This information will help in assessing the achievement of the objectives of the community IMCI strategy, and may also be useful in advocating for expansion to non-C-IMCI-compliant areas in the country.

Methodology

Study sites

The study was conducted in two LGAs in Osun State, an inland state in the south-western zone of Nigeria,[10] between August and September 2007. Ife Central is the only LGA in this zone that is C-IMCI compliant so far. Ife North was selected from the remaining 29 non C-IMCI-compliant LGAs in Osun State by ballot. The two LGAs represent a mixed blend of rural and urban communities, with the majority of the population involved in farming and trading in local produce.

Study design

The survey employed a comparative cross-sectional design.

Study population

The study subjects were mothers/caregivers of children 0 - 59 months of age, and their index children.

Sampling technique

A multi-stage sampling procedure was used to select 260 and 255 respondents from the compliant (Ife Central) and non-compliant (Ife North) LGAs, respectively, as described below.

In the first stage, 2% of the enumerated areas (EAs) in each LGA were selected using a systematic random sampling method. Ife Central has 180 EAs and Ife North has 163. At each site, the required sample sizes of 260 and 255 were divided by the selected number of EAs to determine the number of respondents that were to be recruited from each EA. In Ife Central, 65 respondents from each of 4 EAs were recruited. In Ife North, 85 respondents from each of 3 EAs were recruited.

In stage 2, all the streets in the selected EAs of the two LGAs were systematically labelled high (H) or low (L) (secondary sampling units), and one street was randomly selected (using a ballot system) from each EA. Interviews with subjects in eligible households began in low-numbered houses and continued towards the high-numbered ones if an 'L' street was selected, and in the reverse order for an 'H' street.

The sampling unit was the household. In any household visited, eligibility for participation was the presence of a child under 5 years old (i.e. 0 - 59 completed months). When there was more than one child in the household, a ballot system was adopted to select the reference child.

Data collection techniques and instruments

Structured questionnaire. An interviewer administered a 23-page structured questionnaire (adapted from one originally developed by WHO/Nigeria) to caregivers of eligible children. The instrument covers the four key areas of household practices, viz. growth promotion, disease prevention, home management and care seeking.

Weighing of reference children. Standardised and calibrated stand-on scales were used to weigh the children, with their underpants on. For children who could not stand, the mother was weighed together with the child, then the mother was weighed alone and the difference was recorded as the child's weight.

Evidence of immunisation was obtained from the immunisation card or by history. Vitamin A coverage rate was sought by history and also by checking the immunisation/child health card. Information was obtained on what caregivers had done during their child's last illness.

Quantitative data management

Completed questionnaires were checked for completeness, errors and inconsistencies; any detected were verified and corrected by the respective interviewers.

Epi Info software (version 6.04c) was used for data entry, validation, cleaning and analysis. Prevalences of key practices were calculated. Frequency distributions were generated for all categorical variables and means and standard deviations were determined for continuous variables. Anthropometric measurements were converted, using EpiNut to standard z-scores. Underweight was defined as z-scores of -2 or less for the Child Growth Standards reference value for age (National Center for Health Statistics). The chi-square test was used to compare categorical variables for possible significant differences between compliant and non-compliant LGAs. All statistical tests were carried out at a 0.05% level of significance, at a 95% level of confidence. The statistical power of the study was 90%.

Ethical considerations

Approval was obtained from the Research and Ethics Committee of Lagos University Teaching Hospital. Written informed consent was obtained from study participants.

Results

Two hundred and sixty and 255 questionnaires were administered in Ife Central and Ife North LGAs, respectively. Two hundred and forty-two and 246 valid questionnaires were collected, yielding response rates of 93.1% and 96.5%, respectively, from the LGAs. Table I shows that there were significant differences between the respondents from the two LGAs.

Disease prevention

Hand-washing practices. Table II shows that the majority of caregivers in both LGAs used soap to wash their hands after using the toilet, but far fewer used soap to wash their hands after attending to a child who had passed a stool. Significantly more caregivers from the C-IMCI-compliant LGA than from the non-compliant LGA used improved hygienic practices (Table II).

Malaria prevention. Caregivers from the C-IMCI-compliant LGA were more than 1.5 times more likely than those from the non-compliant LGA to have used a method to prevent malaria ((95.5% v. 56.5%). Caregivers' practices with respect to methods used in malaria prevention are set out in Table III.

HIV/AIDS prevention. Caregivers' knowledge and beliefs with regards to HIV/AIDS are shown in Table IV. More caregivers from the non-compliant than from the compliant LGA showed deficiencies in their knowledge base of HIV/AIDS infection. Knowledge was particularly poor regarding mother-to-child transmission (MTCT) of HIV. One-fifth of respondents from the non-compliant LGA erroneously believed that a child can contract HIV by playing with HIV-infected children. However, the proportion of HIV-infected children was very low in both LGAs.

Discussion

The IMCI strategy was developed in an attempt to reduce the nearly 12 million deaths of children under 5 that occur each year. Its implementation in Nigeria started in 1997 with the first two components. The community component (C-IMCI) was introduced in 2005 after a country-wide baseline survey of key family and community practices that impact on child survival.[9]

The study has demonstrated the benefits of implementing C-IMCI. Better outcome indicators were observed after C-IMCI implementation in the compliant LGA. Caregivers

TABLE I. DEMOGRAPHIC CHARACTERISTICS OF RESPONDENTS AND INDEX CHILDREN (*N* (%))

	C-IMCI-compliant LGA	Non-C-IMCI-compliant LGA	x^{2*}	p^*
Caregivers	*N*=242	*N*=242		
Age (yrs)				
10 - 19	1 (0.4)	3 (1.2)	11.29	0.046
20 - 29	131 (54.2)	132 (53.7)		
30 - 39	86 (35.5)	74 (30.1)		
40 - 49	18 (7.4)	15 (6.1)		
50 - 59	4 (1.7	15 (6.1)		
60 - 69	2 (0.8)	7 (2.8)		
Gender				
Male	2 (0.8)	10 (4.1)	5.33	0.021
Female	240 (99.2)	236 (95.9)		
Marital status				
Single	54 (22.3)	48 (19.5)	12.39	0.015
Married	173 (71.5)	179 (72.8)		
Divorced	6 (2.5)	1 (0.4)		
Separated	8 (3.3)	7 (2.8)		
Widow/widower	1 (0.4)	11 (4.5)		
Educational status				
None	18 (7.4)	22 (8.9)	10.11	0.072
Quaranic school	11 (4.5)	8 (7.3)		
Primary not completed	21 (8.7)	27 (11)		
Primary completed	42 (17.4)	48 (19.5)		
Junior secondary	55 (22.7)	56 (22.8)		
Senior secondary	76 (31.4)	6 (2.4)		
Post-secondary	19 (7.9)			
Children	*N*=242	*N*=246		
Age (mo.)				
0 - 5	27 (11.2)	8 (3.3)	29.46	0.000
6 - 11	69 (28.5)	43 (17.5)		
12 - 23	83 (34.3)	92 (37.4)		
24 - 35	24 (9.9)	54 (22.0)		
36 - 59	39 (16.1)	49 (19.8)		
Gender				
Male	130 (53.7)	125 (50.8)	0.41	0.52
Female	112 (46.3)	121 (49.2)		

*The chi-square test was used to determine significant differences between LGAs.

TABLE II. HAND-WASHING PRACTICES: PROPORTION OF CAREGIVERS WHO WASHED THEIR HANDS WITH SOAP/ASH AFTER SPECIFIC EVENTS (*N* (%))

Hand-washing practices	C-IMCI-compliant LGA (*N*=242)	Non-C-IMCI-compliant LGA (*N*=246)	x^{2*}	p^*
After toilet	211 (87.2)	198 (80.4)	4.04	0.045
After child defecated	103 (42.6)	38 (15.4)	43.66	0.000
Before preparing food	42 (17.4)	3 (1.2)	37.94	0.000
Before feeding child	67 (27.7)	13 (5.3)	44.6	0.000
Before eating	40 (16.5)	25 (10.2)	4.28	0.039
After eating	155 (64.1)	177 (72)	3.50	0.061
After eating oily food	29 (12)	38 (15.5)	1.24	0.266

*Chi-square and *p*-values represent comparisons of data between compliant and non-compliant LGAs after C-IMCI implementation.

demonstrated improved practices and better knowledge than those in the LGA in which C-IMCI had not been implemented in respect of hand-washing practices, prevention of malaria, and knowledge of caregivers on the modes of MTCT of HIV/AIDS.

In spite of these achievements, gaps still needed to be filled in the compliant LGA. For example, despite the fact that caregivers in the compliant LGA demonstrated better hygiene practices than those in the non-compliant LGA, only a minority of caregivers in the compliant LGA did so. Less than half of caregivers in both LGAs reported hand washing with soap after attending to a child who had passed a stool; poor hygiene practices may be related to the misconception that a child's faeces is not harmful. Studies have shown statistically significant reductions in the incidence of diarrhoea

TABLE III. PROTECTION OF CHILDREN FROM MALARIA: CAREGIVERS' METHODS OF MALARIA PREVENTION AND PROPORTION OF CHILDREN USING ITNS (*N* (%))

	C-IMCI-compliant LGA (*N*=242)	Non-C-IMCI-compliant LGA (*N*=246)	x^{2*}	*p**
Ever used a method to prevent malaria				
Yes	231 (95.5)	139 (56.5)	101	0.000
No	11 (4.5)	107 (43.5)		
Methods mentioned for malaria prevention				
Coils	118 (48.8)	78 (31.7)	14.76	0.000
Sprays	69 (28.5)	34 (13.8)	15.81	0.000
Flit gun	17 (7.0)	3 (1.2)	10.46	0.001
Repellants	9 (3.7)	20 (8.1)	3.24	0.072
Screening of doors and windows	60 (24.8)	61 (24.8)	0.000	0.999
Cleaning of environment	36 (14.9)	2 (0.8)	33.60	0.000
Bed nets	42 (17.4)	12 (4.9)	19.30	0.0000112
Bed nets available				
Yes	42 (17.4)	12 (4.9)	18.05	0.000
No	198 (81.8)	234 (95.1)		
Don't know/no response	2 (0.8)	0 (0.0)		
Child slept under ITNs the previous night				
Yes	31 (12.8)	6 (2.4)	18.7	0.000
No	211 (87.2)	240 (97.6)		

*Chi-square and *p*-values represent comparisons of data between compliant and non-compliant LGAs after C-IMCI implementation.

TABLE IV. PREVENTION AND CARE OF HIV/AIDS: CAREGIVERS' RESPONSES TO HIV/AIDS INFECTION IN CHILDREN, SOME ROUTES OF HIV/AIDS TRANSMISSION IN CHILDREN, AND PROPORTION OF HOUSEHOLDS WITH CHILDREN UNDER 5 YEARS INFECTED WITH HIV/AIDS (*N* (%))

	C-IMCI-compliant LGA	Non-C-IMCI-compliant LGA	x^{2*}	*p**
Caregivers' belief that a child can get HIV/AIDS infection	*N*=242	*N*=246		
Yes	164 (67.7)	95 (38.6)		
No	65 (26.9)	92 (37.4)	52.86	0.000
Don't know	10 (4.1)	57 (23.2)		
No response	3 (1.2)	2 (0.8)		
Routes of transmission of HIV/AIDS	*N*=171	*N*=102		
During pregnancy	74 (43.3)	53 (52)	1.94	0.164
During delivery	68 (39.8)	14 (13.7)	20.62	0.000
From breastmilk	69 (40.1)	8 (7.8)	33.34	0.000
Playing with HIV/AIDS children	2 (1.2)	20 (19.6)	29.32	0.000
Don't know	6 (3.5)	8 (7.8)	2.47	0.116
Others (blood, injection and other correct responses)	13 (7.6)	5 (4.9)	0.76	0.384
Households with children under 5 years infected with HIV/AIDS	*N*=236	*N*=235		
Yes	2 (0.8)	1 (0.4)	0.32	1.000
No	234 (99.2)	232 (98.7)		
Don't know	0 (0.0)	1 (0.43)		
No response	0 (0.0)	1 (0.43)		

*Chi-square and *p*-values represent comparisons of data between compliant and non-compliant LGAs after C-IMCI implementation.

following health education and augmented water supply interventions.[11-13]

Particularly impressive was the high proportion of caregivers in the compliant LGA who had ever used a method of preventing malaria (95% v. 56% in the non-compliant LGA). A very low level use of insecticide-treated nets (ITNs) was reported in both LGAs. Reasons for low use differ according to LGA. While most caregivers from the compliant LGA did not use the nets because of their 'high cost', ignorance was the major barrier to its use in the comparative LGA. This finding is similar to those from the Netmark project, in which a low level of use of household nets was reported in Nigeria because nets were considered very expensive luxury items.[12,14]

The ability to identify some features of AIDS in children shows that there is a certain level of awareness in this regard. Knowledge about MTCT, however, was low across both LGAs. Knowledge of modes of MTCT (such as during pregnancy, delivery and from breast milk) was better in the C-IMCI-compliant than in the non-compliant LGA. After CIMCI implementation more caregivers knew that MTCT could occur through breast milk and that HIV/AIDS cannot be transmitted when uninfected children play with those who are infected. However, the prevalence of HIV-infected children in the study LGAs was low.

A notable observation was that almost 80% of caregivers from the compliant LGA had obtained information on prevention and management of childhood illnesses from trained CORPs, showing the synergistic effect of the community IMCI intervention in building caregivers' capacity in child care. Potential openings for interventions in the non-compliant LGA exist; this is evident in the call of opinion leaders for the establishment of the IMCI programme in that LGA and their willingness to collaborate with government on measures to improve the health status of the community. These openings must be utilised in order to achieve the health-related MDGs by 2015.

Significant differences between the two study LGAs were noted in respect of age and marital status of caregivers, and the age distribution of the index children. In the C-IMCI--compliant LGA, a larger proportion of children was aged under 2 years than in the non-compliant LGA. These differences could potentially act as confounders in the interpretation of the differences between these LGAs. These differences should be explored further.

In conclusion, the positive effect of partnering with communities in improving their health-promoting knowledge and practices has been shown. Such a partnership promotes a sense of belonging and ownership, thereby ensuring sustainability of developmental programmes. The fact that some gaps still exist in the compliant LGA underscores the need to empower communities with regular and appropriate health care information and resources to improve their existing perceptions, knowledge and practices, particularly with respect to the management of childhood illnesses.

Our findings justify scaling up of C-IMCI to other communities that have yet to commence implementation. The gains recorded in the compliant LGA should be consolidated by strengthening existing partnerships between government and community.

Once the strategy is correctly implemented, it is to be hoped that further studies will demonstrate that the gains in health knowledge and practice translate into a reduction of under-5 deaths and disabilities caused by the IMCI-targeted, preventable diseases.

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