Family practices that influence the uptake of the Intergrated Management of Childhood Illnesses (IMCI) strategy among mothers at the MCH/FP clinic at Pumwani Maternity Hospital, Kenya

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SUMMARY

Background: Since 1999 the Government of Kenya has introduced the Integrated Management of Childhood Illness (IMCI) in an attempt to reduce child mortality. The IMCI strategy, developed by WHO and UNICEF, aims to improve the management of childhood illness at the primary health care level. The aim of this study was to determine the family practices that influence the uptake of the IMCI strategy among mothers in the MCH/FP clinic at Pumwani Maternity Hospital.

Methods: A cross sectional survey was conducted at Pumwani Maternity Hospital MCH/FP clinic. A sample size of 385 mothers at the MCH/FP clinic was interviewed for quantitative data. All independent variables identified to significantly associate with *'uptake of IMCI'* at bivariate analysis was considered together in a multivariate analysis. SPSS version 22 was used for statistical analysis.

Results: Out of the 385 respondents interviewed, 78.4% children were well, 74.3% were of normal weight and 88.6% had been fully immunized. At multivariate analysis, statistically significant predictor family practices of IMCI uptake were fever experience, cough experience, living in Nairobi and giving iron supplements to the children.

Conclusion: The uptake of the IMCI strategy, though high, was not optimal. There were many children who were underweight, had illnesses and were not fully immunized. These findings highlight the need for continuous strengthening of the IMCI strategy in health facilities.

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Introduction

The 4th millennium development goal (MDG) is to reduce child mortality by two thirds between 1990 and 2015 [1]. Between 1990 and 2008, the death rate for children under five decreased by 28 per cent, from 100 deaths to 72 deaths per 1,000 live births. That means that, worldwide, 10,000 fewer children under-five die each day. However, the current rate of progress is well short of the MDG target of a two-thirds reduction by 2015 [1].

Despite substantial efforts to improve the health and nutritional status of children in developing countries in the last two decades, every year about 12 million children die before they reach their fifth birthday, many during the first year of life [2]. The majority of these deaths occur in the African region. Most countries in Africa continue to register high infant mortality rates (IMR) ranging from 50 deaths per 1000 live births to 191 deaths per 1000 live births and under-five mortality rates (U5MR) ranging from 100 deaths per 1000 live births to 320 deaths per 1000 live births. Approximately 70% of these deaths are due to only five conditions - acute respiratory infections, diarrhea, malaria, measles and malnutrition - or a combination of these conditions. Malnutrition is an underlying factor in about 54% of the deaths [2].

In Kenya, child mortality remains unacceptably high, the infant mortality rate is 52 deaths per 1,000 live births and the under-five mortality is 74 deaths per 1,000 live births [3]. Since 1999 the Government of Kenya has introduced the Integrated Management of Childhood Illness (IMCI) in an attempt to reduce child mortality. The IMCI strategy, developed by WHO and UNICEF, aims to improve the management of childhood illness at the primary health care level [4].

Integrated Management of Childhood Illnesses (IMCI) is a broad strategy with an overall objective of contributing to reducing child morbidity and mortality in developing countries. It encompasses a range of interventions to prevent illness and reduce deaths from common childhood conditions, and to promote child health and development. The strategy combines improved management of common childhood illnesses with aspects of nutrition, immunization, and other important factors influencing child health, including maternal health. The IMCI strategy involves the following three components:

1. Improvements in the case management skills of health workers through training, support supervision and provision of locally adapted guidelines on Integrated Management of Childhood Illness and activities to promote their use.
2. Improvements in the health systems required to deliver quality care.

3. Improvements in the household and community practices for child survival, growth, and development [2].

By 2007, almost two-thirds of districts were implementing IMCI to some degree, mainly focusing on improving case management skills and health care delivery systems. However, implementation of IMCI remains highly inadequate. The three major challenges are: low training coverage; trained health workers not following guidelines; and barriers to access for community members [4].

With the high prevalence of child mortality and morbidity while there is an IMCI strategy in place, this study investigated the current uptake and the family practices that influence the uptake of the IMCI strategy. The findings will enable policy makers determine the gaps in the IMCI strategy so as to reduce the burden of childhood illnesses.

Materials and Methods

Study area: The study was done in Nairobi at the MCH/ FP clinic at Pumwani Maternity Hospital. The hospital is located in the east side of Nairobi and is surrounded by the low-income residential areas of Eastleigh, Mathare, Muthurwa, and Majengo. The MCH/FP clinic at the hospital attends to an average of 315 mothers and their children from different religious, cultural and social backgrounds every month. The clinic also has an average of 17 health workers of different cadres including clinical staff, counselors and nutritionists at any one time attending to the mothers.

Study design: The study used a cross sectional survey to determine the family practices that influences the uptake of the IMCI strategy among mothers in the MCH/FP clinic at Pumwani Maternity Hospital.

Study population: The study population comprised 385 mothers attending the MCH/FP clinic at Pumwani Maternity Hospital.

Data collection: Quantitative data was collected using semi structured questionnaires. Both close and open ended questions were used to collect data on social demographic, household characteristics and family practices.

Data analysis: In bivariate analysis, all independent variables were associated with the dependent variables (*uptake of IMCI)* to determine which ones had significant association. Odds Ratio (OR) and 95% Confidence Interval (CI) were used to estimate the strength of association between independent variables and the dependent variable. The threshold for statistical significance was set at $\alpha = 0.05$ and a two-sided p value at 95% confidence intervals (CI) reported for corresponding analysis. In multivariate analysis, all the variables which showed a statistically significant association with child morbidity status, child weight status and child immunization status in the bivariate analysis were then considered and

included in the multiple unconditional logistic model to assess individual variable influence on the uptake of IMCI, after controlling for confounders.The logistic regression model that best predicts the IMCI uptake from the various predictors considered has p-value <0.001. The model used was: Logit P (predictors of IMCI uptake) = $\alpha + \beta1 + \beta2 + \beta3 + \beta4 + \beta5 + \beta6$. SPSS version 22 was used for statistical analysis.

Ethical consideration: A written informed consent was sort from the participants. KEMRI ERC approved the study.

Results

Demographic characteristics

Majority (97.9%) of the respondents at the MCH/ FP clinic live in Nairobi and 2.1% do not. The mean age of the respondents was 26.46 (+/- 4.7) years, age range was 14 –43 years with the youngest respondent being 14 years while the oldest was 43 years. The mean weight of the children in the study was 5.698 kgs while the average age was 5 months.

Morbidity status, weight status and immunization status of the children attending the MCH/FP clinic

The uptake of the IMCI strategy among mothers attending the MCH/FP clinic at Pumwani Maternity Hospital was measured using the following variables: morbidity (wellness) uptake, weight uptake and the immunization uptake, according to the age, of the children of the respondents who were interviewed. On the day of interview, about 21.6% of the respondents had children with various ailments, while 78.4% of the respondent's children had no health related complaints, as shown in Table 1. Majority of the respondents (74.3%), had children who were of normal weight while 25.7% of the respondents had children who were underweight. Table 1 depicts this occurrence. About 11% of the respondent's children had not been fully immunized for their ages while 89% had been fully immunized for their ages. This is shown in Table 1.

Table 1: Child Heath Status

Health characteristic	Status	Frequency (N)	Percentage (%)
Morbidity status	Well	301	78.4
	Unwell	84	21.6
Weight status	Normal weight	286	74.3
	Underweight	99	25.7
Immunization status	Fully immunized	342	89
	Not fully immunized	43	11

Family practices that influence the uptake of the IMCI strategy among mothers attending the MCH/FP clinic

Child wellness uptake

The variables that showed statistical significant association with child wellness uptake included: religion, bleach/ chlorine as water cleanser, LPG/ natural gas as cooking fuel, charcoal as cooking fuel, frequency of listening to radio, previous illness experience. After adjusting for other factors, results of the logistic regression model indicated statistically significant predictor factors to child wellness uptake to be; fever experience, which showed that those who had had a previous fever experience had 78% reduced chance of the child being well (95% CI 0.077 – 0.660: P=0.007) than those who had no previous fever experience. Respondents whose children had had a previous cough experience had 56% reduced chance of having well child (95% CI 0.226 – 0.838:P= 0.013). This is shown in Table 2.

Table 2: Multivariate analysis of factors influencing child wellness uptake among mothers attending MCH/ FP clinic at Pumwani Maternity Hospital

Variable	Adjusted Odds Ratio	P>|z|	[95% Conf. Interval]
Religion	3.169	0.083	0.860 – 11.677
Bleach/ chlorine as water cleanser	0.652	0.164	0.356 –1.192
LPG/ natural gas as cooking fuel	1.454	0.217	0.802 –2.638
Charcoal as cooking fuel	0603	0.114	0.322 – 1.128
Frequency of listening to radio	0.605	0.118	0.322 – 1.137
Diarrhea experience	0.625	0.085	0.366 –1.066
Fever experience	0.225	0.007*	0.077 – 0.660
Cough experience	0.435	0.013*	0.226 – 0.838

**Statistically significant factor*

Child weight uptake

The variables that showed statistical significant association with child weight uptake included: giving

iron supplements, complementary feeding, previous diarrhea, fever and cough experience and action taken to stop fever. These are summarized in Table 3. After adjusting for other factors, results of the logistic regression model indicated statistically significant predictor factors to child weight uptake to be; previous cough experience, where, the children who had had a previous cough experience had a 2.7 times increased chance of being of normal weight than those who had not had (95% CI 1.110 – 6.647:P = 0.029).

Table 3: Multivariate analysis of factors influencing child weight uptake in the IMCI strategy among mothers attending MCH/ FP clinic at Pumwani Maternity Hospital

Variable	Odds Ratio	P>|z|	[95% Conf. Interval]
Iron supplements	1.514	0.185	0.820 – 2.794
Diarrhea experience	1.291	0.330	0.772 – 2.157
Fever experience	1.780	0.056	0.986 – 3.211
Cough experience	2.717	0.029*	1.110 – 6.647

**Statistically significant factor*

Child immunization uptake

The variables that showed statistical significant association with child immunization status included: residence, radio acquired health information, wood as cooking fuel, less than 5 people in the household, giving iron supplements to the child and age. (Table 4)

After adjusting for other factors, results of the logistic regression model indicated statistically significant predictor factors to child immunization uptake to be; residence, which showed that it was 14 times more likely that the respondents who lived in Nairobi will be fully immunized (95% CI 2. 1.940 – 107.592: P=0.009) than those who did not reside in Nairobi. It was also 3 times more likely that respondents who were giving iron supplements to their children would have fully immunized children (95% CI 0.568 – 6.438:P=0.021).

Table 4: Multivariate analysis of factors influencing child immunization uptake in the IMCI strategy among mothers attending MCH/ FP clinic at Pumwani Maternity Hospital

Variable	Odds Ratio	P>|z|	[95% Conf. Interval]
Residence	14.447	0.009*	1.940 – 107.592
Radio acquired health info	0.514	0.061	0.256 – 1.030
Wood as cooking fuel	1.139	0.886	0.193 – 6.723
0 - 5 people household	1.913	0.295	0.568 – 6.438
Iron supplements to child	3.168	0.021*	1.191 – 8.428
Age (10 -20)		0.635	
Age (21 – 25)	0.407	0.407	0.049 – 3.401
Age (26 – 30)	0.737	0.713	0.144 – 3.756
Age (31 – 35)	0.524	0.438	0.102 – 2.688
Age (36 – 45)	1.028	0.973	0.207 – 5.109

**Statistically significant factor*

Discussion

This study measured the health status of the children at the MCH/FP clinic. The study found that about a quarter of the children were underweight. This result is higher than the KDHS 2008/09 report where 16% of children under five were underweight (low weight-for-age) and 4% were severely underweight. The result is also higher than the results found in a study conducted in the informal urban settlements in Nairobi that found that the prevalence of underweight (low weight-for-age) was 11.8%; 3.1% of the children were severely underweight and the prevalence of underweight children was highest among children aged 24-35 months [5]. This shows a major gap in feeding practices in this demographic. The study also measured appropriate for age immunization status of the children. Majority of the children in the study were found to be fully immunized. The result is higher than studies conducted in the informal urban settlements in Nairobi that found the up-to-date (UTD) coverage with all vaccinations at 12 months was 41.3% and 51.8% with and without the birth dose of OPV, respectively [6] and in Khartoum state of Sudan that found approximately three quarters of children under the age of five had been vaccinated correctly either completely or had received the specific dose of vaccination for their age against one or more of the

six killer diseases [7]. This shows that vaccine coverage is quite good but still not 100%. The morbidity or wellness of the children on the day of interview was measured by asking the care givers if they were bringing the children for a routine checkup or for treatment. About a fifth of the respondents in this study had children with various ailments, while a majority of the respondents' children had no health related complaints. The results are lower than those found in a study done in under 5 children in the urban slum area of Bhubaneswar City, Odisha that found that about half of the children were suffering from some form of morbidity [8].

This study also found that previous fever experience significantly reduced the chances of having a well-child and, likewise, previous cough experience reduced the chances of having a well-child significantly. This can be attributed to the child's surrounding environment. In a study done in South Africa the results showed that absence of electricity for heating purposes was associated with a 30% increase in risk for acute respiratory syndrome, while not having one's own refuse receptacle was associated with a doubling in the risk [9]. Also, a study carried out in the USA found that children living in polluted areas experienced significantly more cough and phlegm, rhinitis, pneumonia, and early respiratory infections than control subjects [10]. A study done in four sub Saharan countries found that in general, vaccination against fever-related diseases and the use of improved toilet facility reduces fever prevalence while the use of bed nets by children and mothers did not show consistent relationship across the countries [11]. The authors of a study done in developing countries argue that in order for any real reduction in mortality and quality of life to be sustained, attention needs to be focused equally upon the environmental and social factors which underlie much of the childhood diseases in the developing world [15]. The study also found that previous cough experience increased the child's chances of being of normal weight by 2.7 times. The finding however contradicts a study done in western Kenya that reported that having upper respiratory infections or other illness in the past month predicted underweight [12]. Further focused research is required on the direct effects of previous ailment experiences on the weight of a child. The study found that living in Nairobi was 14 times more likely for the respondents to have an appropriate for age fully immunized child. This finding is in agreement with the KDHS 2008/09 [3] report that found full vaccination coverage among urban children is somewhat higher than among rural children and a study done in the Khartoum state of Sudan that found that mothers of children from urban areas reported correct vaccination more than mothers of children in rural areas [7]. In the study, the respondents who were giving their children iron

supplements were 3 times more likely to have a fully immunized child than those who were not giving iron supplements. This can be related to contact with a health facility as this would ensure contact with health workers and the right information given to the care givers. A study done in India found that the presence of an Urban Health Center within 2 km of a slum was associated with more than twice the likelihood of children being completely or partially immunized [13]. A study conducted by the ARISE project also found that community-centered health workers contributed to immunization coverage improvement by providing services and information directly, building effective community partnerships, and ensuring continuity in the relationship between health workers and client [14].

Conclusion

The IMCI uptake in this study was measured using the wellness uptake, weight uptake and immunization uptake of the respondents' children. The IMCI strategy is supposed to reduce the number of underweight, sick and not fully immunized children. The results showed that the IMCI uptake was not optimal for all the parameters. The factors that positively influenced the IMCI uptake among respondents at the MCH/FP clinic at Pumwani Maternity Hospital included: previous cough experience on child weight status, living in Nairobi and respondents who were giving their children iron supplements had positive impact. While the negative family practices were previous fever experience and previous cough experience on child wellness status.

In conclusion, increasing contact of respondents with health facilities or health workers is paramount. Appointing regional IMCI champions mandated with ensuring all facets of the strategy are being supported and implemented and conducting further research on correlations between the family practices and IMCI uptake needs to be prioritised.

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