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M. W. Kamau, BSc (Nurs), MSc (Public Health), Lecturer Presbyterian Universityof East Africa, A. O. Makokha, BSc, MPhil, PhD (Food Science), Associate professor, Jomo Kenyatta University of Agriculture and Technology, P. O. Box 62000-00200, Nairobi, J. K. Mutai, BA, MA, PhD (Sociol), Research Officer, Kenya Medical Research Institute and Lecturer, Jomo Kenyatta University of Agriculture and Technology, P. O. Box 62000-00200, Nairobi, I. K. Mugoya, MBChB, MSc, Programme Manager, Ministry of Public Health and Sanitation, Division of Vaccines and Immunisation and Lecturer, Jomo Kenyatta University of Agriculture and Technology, P. O. Box 62000-00200, Nairobi , Kenya

FACTORS INFLUENCING VITAMIN A SUPPLEMENTATION AMONG MOTHERS OF CHILDREN UNDER FIVE YEARS OLD AT MBAGATHI DISTRICT HOSPITAL, KENYA

M. W. KAMAU, A. O. MAKOKHA, J. K. MUTAI and I. K. MUGOYA

ABSTRACT

***Background*: Vitamin A supplementation is one of the best-proven and most cost-effective interventions to improve vitamin A status and save children's lives.**
***Objective*: To assess factors affecting practices and utilisation of Vitamin A supplementation services among mothers with children below five years attending Mbagathi District Hospital.**
***Design*: Cross-sectional descriptive study.**
***Setting*: Mbagathi District Hospital (MDH) Maternal and Child Health Clinic (MCH) and Paediatric Out Patient Department (POPD).**
***Subjects*: Mothers attending MDH MCH and POPD.**
***Main Outcome Measures*: Utilisation, Practices and Awareness of vitamin A supplementation (VAS)**
***Results*: A total of one hundred and fifty eight respondents were interviewed. About a half (52%) of the respondents had their children up to date with VAS while less than a half (43%) of the mothers had received vitamin A after delivery. Three quarters of the respondents' children had missed the vitamin A capsule because they were either not aware of schedule (41%) or had stopped coming to clinic (35%). This notwithstanding, 91% of the respondents neither encountered any problems when seeking VAS services nor had negative beliefs or superstitions about vitamin A.**
***Conclusion*: The main factors affecting utilisation of VAS services was lack of information and awareness among both health workers and mothers. These services are averagely well utilised at MDH though still below the National 80% coverage target.**

INTRODUCTION

Vitamin A deficiency (VAD) is estimated to affect at least 250 million children in the developing world. It is a major contributor to child morbidity in sub-Saharan Africa, where an estimated 42% (43.2 million) of children under five-years have VAD. Effective and sustained VAD control could reduce the under-five mortality in the region by 25% and avert over 645,000-child deaths annually (1-4). According to 1999 Kenya Micronutrient Survey (5), 76% of children had VAD making Kenya one of the countries with low serum levels according to the World Health Organization (WHO). By 2008, this level had risen to 84% (2).

Approximately two-thirds of the 10.8 million child deaths worldwide can be prevented by available interventions such as VAS (6). This is essential to meet the fourth Millennium Development Goal (MDG), which is to reduce child mortality by two thirds among children aged below five years by 2015 (3). Through the efforts of WHO and its partners, an estimated 1.25 million deaths due to VAD have been prevented since 1998 in 40 countries. In 1999, administration of over 97 million doses in 50 countries helped avert an estimated 242,000 deaths (8).

Vitamin A Supplementation has been proved to be an efficient and effective way to mitigate against VAD for all age groups. Given twice a year, VAS has been shown to reduce all-cause mortality of children under five years by 23-34% while post-natal supplementation provides further benefits to the child through enriched breast milk (3,4,6). In Kenya VAS is routinely administered to children below five-years and post-partum mothers within six weeks post delivery. Though no major stock-out has been reported, VAS coverage remains far below the target (2).

A key barrier to sustainable programming remains the lack of recognition of the need for VAS. Although linkages with other interventions produce high coverage, minimum efforts have been made to effectively communicate the importance of vitamin A for child survival. Knowledge, attitude, and practice surveys have revealed this failing at various levels, from policy makers to caregivers. Unless this knowledge gap is addressed, a transition from a push-driven to a demand-driven intervention cannot be expected (9). Successful supplementation programmes require appropriately designed information, education and communication strategies. To ensure VAS is accepted and adhered to by caregivers, it is necessary to ensure that the rationale for VAS is explained, specific questions answered and clear instructions given (10).

In Kenya, VAS has performed poorly compared to immunisation services despite the two using the same delivery strategies and structures. The core to understanding factors affecting VAS countrywide lie in gaining a basic understanding of the knowledge, awareness, attitudes, beliefs, constraints and practices of caregivers, who mostly are the children's mothers, because this determines their demand and utilisation of VAS services. This study assessed the factors affecting practices and utilisation of VAS services among mothers of children under five years old attending MDH.

MATERIALS AND METHODS

A descriptive cross-sectional study was conducted among mothers of children under five years old attending Mbagathi District Hospital (MDH) Maternal and Child Health Clinic (MCH) and Paediatric Outpatient Department (POPD). Mbagathi District Hospital is the largest district hospital in Nairobi province, Kenya, which serves as a referral hospital for all the health centres and dispensaries in the Province. The study was conducted between June and July 2009.

Approval for scientific and ethical clearance was sought from the KEMRI Scientific Steering Committee and National Ethical Review Committee respectively. Emphasis on issues of confidentiality and privacy were made clear at the time of consenting to participate in the study and participants were required to give written informed consent prior to their voluntary participation in the study.

Sample size calculation was based on VAS coverage among children under five years old in Dagoretti District, where MDH is located. This coverage was 10.7% for the period between January and June 2007. Fisher's formula [$N = Z^2 P (J - P) / d^2$] was used to calculate the sample size, giving minimum sample size of 147 respondents. A systematic random sampling was used where every alternate respondent was recruited. Key informants were purposively chosen for in-depth interviews and focus group discussions.

Quantitative data were collected by administering questionnaires to mothers with children under five years old. The data were coded, entered, validated and analysed using *Epi Info version 3.3.2*. Data cleaning and validation were done prior to analysis. Descriptive statistics were done for different groups. Proportions of independent variables in different groups were compared by calculating chi square (x^2). To measure strength of association between the exposures and the outcomes, bivariate analysis was done. Ninety-five confidence intervals (95% CI) and two-tailed p-value were calculated to assess significance of results obtained. Two-tailed level of significance used was 5% (p-value 0.05). Multivariate analysis was used to control for confounders and effect modification. Qualitative data were collected through focus group discussions (FGDs) and in-depth interviews (IDIs) of both mothers and health workers. Two FGDs were conducted; one at MCH and one at POPD consisting of 8-10 mothers each. Five IDIs were conducted; one mother at MCH, one mother at POPD, Nursing Officer in-charge at MCH, Nursing Officer in-charge at POPD and the nutritionist at MCH. With consent of respondents, the FGDs and IDIs were tape-recorded. Records were transcribed and translated into English then typed in Microsoft Word and exported to *NVIVO version 7* for thematic analysis.

RESULTS

Table 1 summarises the socio-demographic characteristics of respondents. A total of 158 respondents aged between 18 and 41 years were interviewed with a mean age of 26 years. The highest proportion (47%) had gone up to upper primaryeducation level and had one child (46%).

Table 2 shows that about a half, 52%, of the mothers had their children up to date with the recommended schedule for VAS while 3% did not know whether their last child had received all doses of vitamin A due. Majority (90%) of the respondents knew the colour of the capsule their children had received. Most (77%) of the children had received the capsule during routine visit to the clinic although about half (53%) of the mothers preferred campaigns and outreaches.

While most (88%) of the mothers reported they would take their children for the next dose of vitamin A, the reasons for the same were varied as shown in Table 2. They include; it was good for the child (77%), to complete doses of vitamin A (13%) and because they were told by health worker (10%). Very few (4%) of them would fail to take their children for the next dose due to lack of time (46%), failure to know the

benefit (31%) or far distance / lack of transport (23%).

Figure 1 shows the reasons given for children missing VAS which include: the mother not being aware of the VAS schedule (41%), completed immunisation (34%), child being sick (7%), lack of time (5%), negative staff attitude (5%), stock-out of vitamin A capsules (5%) in other health institutions and long distance from the health institutions (3%).

Less than a half (43%) of the mothers had received vitamin A after delivery (Table 1). Out of these, 77% received VAS within the recommended period of up to six weeks after delivery, 7% after the recommended six weeks post-delivery and 5% during pregnancy while 11% could not remember when they received VAS. Level of education and parity were among the major determinants of post-natal VAS as respondents with college education had the highest proportion (52.9%) of those who received vitamin A after their last delivery while mothers with three children and above had the lowest (34.4%).

Table 1

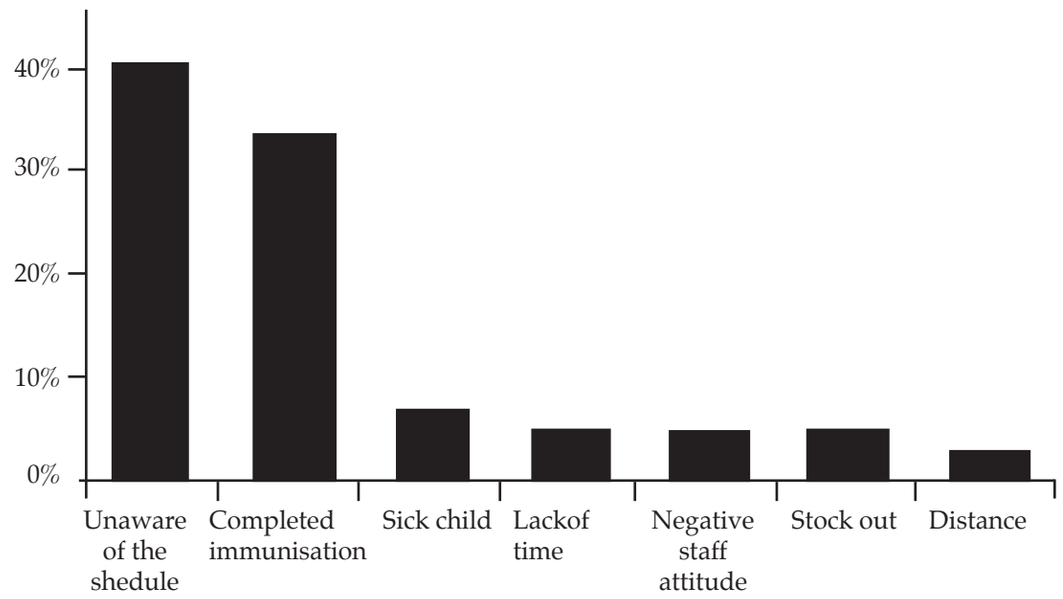
Socio-Demographic Characteristics of Respondents

Variable	Number	Percentage
l. Department		
MCH	81	51
POPD	77	49
2. Maternal age		
Below 20	3	2
20-25	72	45
26-30	57	36
30-35	20	13
Above 35	6	4
3. Residence		
Nairobi North	9	6
Nairobi East	37	23
Nairobi West	105	67
Others	7	4
4. Occupation		
Employed	71	47
Unemployed	81	53
5. Marital Status		
Married	129	83
Unmarried	27	17
6. Highest Education		
College	35	22
Secondary	49	31
Primary	73	47
7. Living children		
1	72	46
2	44	28
3 and Above	40	26
8. Religion		
Christian	151	96
Muslim	7	4

Table 2
Practices and Utilisation of VAS services

Variable	Number	Percentage
l. Proportion of youngest child up to date with VAS (n=158)		
Yes	82	52
No	71	45
Do not know	5	3
2. Circumstances under which child received VAS (n=95)		
Routine Visit to clinic	73	77
Campaigns/outreaches	12	13
Visit to clinic for illness	10	10
3. Reasons for going for next dose (n=135)		
Good for child	102	76
To complete doses of vitamin A	18	13
Told by health worker	15	11
4. Reason for not going for next dose (n=13)		
Lack of time	6	46
Do not know the benefit	4	31
Distance/ Transport	3	23
5. Mothers VAS (n=145)		
Received VAS	62	43
Did not receive VAS/Unsure	83	57
6. Period when mother received VAS (n=62)		
Within 6 weeks post delivery	48	77
After 6 weeks post delivery	4	7
During pregnancy	3	5
Not sure when	7	11
5. Mother's recommended strategy for VAS (n=151)		
Campaigns/Outreaches	86	53
Fixed sites like Hospitals	65	47

Figure 1
Reasons why child had missed VAS



The utilisation as well as awareness of V AS services was consistently noted to increase with the level of education and higher among the employed compared to the unemployed. Mothers with post-primary education were more likely to be aware of the correct VAS schedule (PR 3.23, Chi-square 12.7, p-value <0.001) compared to respondents with primary education (Table 3). Respondents who were married were less likely (PR 0.39, Chi-square 4.45, p-value 0.035) to know the correct VAS schedule compared to their unmarried colleagues. Post-primary education (PR 2.81, Chi-square 6.98, p-value 0.008), being unmarried (PR 0.4, Chi-square 4.3, p-value 0.038) and being employed (PR 2.6, Chi-square 6.37, p-value 0.01) were associated with higher likelihood of being aware of the correct timing of VAS for mothers (Table 4). At multivariate analysis, the level of education remained was the only factor that was statistically associated (p-value < 0.001) with awareness about VAS schedule for both children and mothers.

Figure 2 shows other problems/constraints reported to affect VAS utilisation such as: lack of time/busy work schedule for mothers (2%), long waiting period at clinic (2%), unfriendly staff (2%) and lack of transport to the health facilities (1%). Failure to screen children for VAS status whenever they visited health facilities as well as improper recording were other factors noted to affect VAS coverage.

Table 3
Proportions of Utilisation among Various Groups

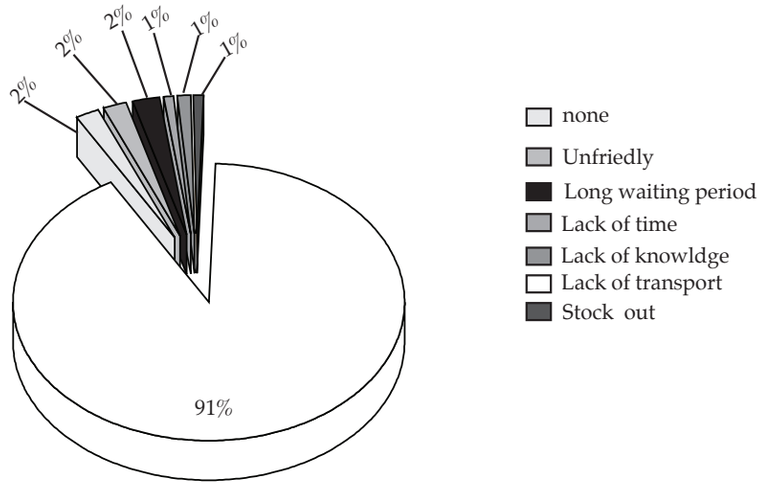
Variable	Number	Percentage	Prevalence	Chi-square	Confidence	P-value
Ratio interval						
1. Last child received all doses due						
a) Age: Up to 25 yrs	34	55.7				
Above 25 yrs	37	51.4	1.19	0.25	0.60-2.36	0.62
b) Education: Post-Primary	40	54.8				
Primary	31	52.5	1.09	0.07	0.55-2.18	0.8
c) Occupation: Employed	35	55.6				
Unemployed	34	53.1	1.10	0.08	0.55-2.22	0.78
d) Marital status: Married	57	53.8				
Unmarried	13	52.0	1.07	0.03	0.45-2.57	0.87
e) No. of children: One	32	56.1				
Two and above	39	52.7	1.15	0.15	0.57-2.30	0.70
2. Received vitamin A after last delivery						
a) Age: Up to 25 yrs	31	44.3				
Above 25 yrs	31	40.8	1.15	0.18	0.60-2.23	0.67
b) Education: Post-Primary	37	45.7				
Primary	25	39.1	1.31	0.64	0.67-2.55	0.42
c) Occupation: Employed	30	44.8				
Unemployed	30	40.5	1.19	0.25	0.61-2.32	0.61
d) Marital status: Married	47	39.8				
Unmarried	13	50	0.66	0.91	0.28-1.55	0.34
f) No. of children: One	29	42.0				
Two and above	32	42.7	0.97	0.006	0.50-1.89	0.94

Table 4
Proportions of awareness among various groups

Variable	Number	Percentage	Prevalence	Chi-square	Confidence	P-value
Ratio interval						
1. Aware of Recommended Schedule in children						
a) Age: Up to 25 yrs	37	49.3				
Above 25 yrs	46	55.4	0.78	0.59	0.42-1.47	0.44
b) Education: Post-Primary	55	65.5				
Primary	27	37	3.23	12.7	1.68-6.22	<0.001**
c) Occupation: Employed	44	62.0				
Unemployed	38	46.9	1.84	3.45	0.96-3.53	0.06
d) Marital status: Married	62	48.1				
Unmarried	19	70.4	0.39	4.45	0.16-0.95	0.035**
e) No. of children: One	41	56.9				
Two and above	41	48.8	1.39	1.03	0.74-2.61	0.31
2. Aware vitamin A is given to mothers						
a) Age: Up to 25 yrs	33	54.1				
Above 25 yrs	39	55.7	0.94	0.03	0.47-1.87	0.85
b) Education: Post-Primary	44	60.3				
Primary	28	49.1	1.57	1.61	0.78-3.16	0.20
c) Occupation: Employed	37	61.7				
Unemployed	31	47.0	1.81	2.73	0.89-3.69	0.10
d) Marital status: Married	56	53.8				
Unmarried	15	60.0	0.78	0.31	0.32-1.89	0.58
e) No. of children: One	35	58.3				
Two and above	36	52.2	1.28	0.49	0.64-2.58	0.48
3. Aware when vitamin A is given to mothers						
a) Age: Up to 25 yrs	19	25.3				
Above 25 yrs	20	24.1	1.07	0.03	0.52-2.20	0.86
b) Education: Post-Primary	28	33.3				
Primary	11	15.1	2.81	6.98	1.28-6.18	0.008**
c) Occupation: Employed	25	35.2				
Unemployed	14	17.3	2.60	6.37	1.22-5.53	0.01**
d) Marital status; Married	28	21.7				
Unmarried	11	40.7	0.40	4.3	0.17-0.97	0.038**
e) No. of children: One	19	26.4				
Two and above	20	23.8	1.15	0.14	0.56-2.37	0.71

** Significant p-value (p-value <0.05)

Figure 2
Problems/constraints experienced with VAS



DISCUSSION

The 52% VAS coverage among children less than five years old was higher than the coverage recorded in Dagoretti District between January and June 2008 of 10.7% (2) and higher than one found during a study conducted in Orissa slums of India where only 12.5% had received VAS (11). This could have been due to the fact that the study was conducted one month after a national campaign for both VAS and polio vaccine, which may have increased the coverage more than would be achieved through routine clinic visits. Very high VAS coverage (>90%) have been recorded during campaigns (2). Most children received the VAS during routine visit to the clinic for immunisation. Though more than half (53%) of the caregivers would have preferred to be given VAS through campaigns and outreaches compared to static points, the approach is expensive and not sustainable. The high number of caregivers who reported they would bring back a child for VAS shows that a substantial number of mothers valued VAS. However, reasons given for returning indicate that mothers did not understand the rationale for VAS. They therefore followed what they were told by health workers as a routine. This may explain why some mothers would only attend VAS services when convenient.

It was noted that mothers stopped attending clinics after a child completed the routine immunisation schedule. This is consistent with a study done in Congo where mothers were found to stop attending the clinic after one year because the child had got all the routine vaccines (l2). Despite 45% of the children not being up to date with VAS, some mothers did not give any reason for missing VAS. They said they were bored and lacked motivation, which is consistent with a study in Ghana where mothers lacked motivation to adhere to VAS (10) and seems to indicate a gap in the awareness of V AS. While routine immunisation is scheduled to end before the first birthday, VAS is meant to end at the age of five years, and is given once every six months. Only one dose of vitamin A (at six months) is given to a child before the first birthday. This may explain the higher coverage with the first dose compared to the subsequent doses as indicated by the administrative data at Ministry of Public Health and Sanitation (2). It shows the care takers are better informed about immunisation than VAS schedule and are keen on having children get all vaccines due. Most children therefore missed VAS after the first year. This could mean that there has been less publicity, social mobilisation and health worker sensitisation about VAS compared to routine immunisations. In addition, there were no measures in place to follow up the mothers or their children if they missed VAS. There is therefore a need to sensitise the health workers and educate mothers about VAS and fully emphasize the benefits of completing VAS schedule.

Apart from MCH clinic, VAS status should also be screened at POPD. However, this did not happen hence missing an opportunity to update children's VAS status. Lack of awareness of VAS among health workers leads to missed opportunities for VAS. It also translates to lack of awareness among caregivers since health workers are the primary source of health information.

Level of education and parity were among the major determinants of post-natal VAS. The coverage increased proportional to level of education indicating importance of health education. Although less than half (43%) of the post-natal mothers received VAS, this was higher than the post-natal coverage data recorded in the MOPHS and in Niger where only an estimated 16% of mothers got VAS within 40 days following delivery (13) but similar to a Philippines study where it was 41% (14). This low coverage may be due to the following reasons: (1) Lack of information as evidenced by the high number of mothers who said that vitamin A was never given to mothers (2). Greater emphasis on child health compared to maternal health at MCH clinic as reported (3) Failure to record as supported by lack of a column to record postnatal V AS at MCH register.

Mothers delivering in a health facility are likely to be given VAS immediately after delivery. However, those who miss this opportunity are rarely screened at MCH clinics, hence missing an opportunity to supplement them.

The utilisation as well as awareness of VAS services was consistently noted to increase with the level of education and higher among the employed compared to the unemployed. This is consistent with a study done in Thika, Kenya, on child care practices whereby time taken to perform various activities was found to vary with the mother's education level and her occupation (15). Educated mothers are more likely to be employed than those who were not. On statistical analysis of education level against employment, mothers with post primary education were found to be four times likely to be employed than those with only primary education (PR 3.96, Chi-square 16.4, p-value <0.0001). So being employed among those more educated was not by chance; it was highly significant though employment alone may not be an independent factor for VAS utilisation. Inequalities in service utilisation by educational attainment have also been evident in other studies. Mother's health education and literacy status has been found to play a major role in improving the

health of the child. Nutritional education provides economies of scale and the promise of long-term sustainability to any public health programme (15-16). This indicates a need for health education to raise awareness about VAS among caregivers.

Factors affecting VAS were more often than not information-related as evidenced by the lack of awareness among both health workers and mothers. This is supported by the fact that most respondents did not report problems while seeking VAS services (Figure 2) and consistent supply of vitamin A capsules was reported. This implies there are no major issues with the technicalities of programme operations hence major issue is information gap.

In conclusion, VAS services utilisation at MDH was found to be below the national target of 80% despite there being no stock-out of vitamin A capsules. Utilisation as well as awareness of VAS services increased with the level of education. The major factors affecting utilisation of VAS services were lack of information and awareness among both health workers and mothers.

Awareness about vitamin A should be created among caregivers and health workers so as to increase utilisation. Missed opportunities should be reduced by screening for vitamin A status of all children and postnatal mothers at every contact with health facility.

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