ORIGINAL ARTICLE

THE IMPACT OF TRAINING ON MALARIA TREATMENT PRACTICES: A STUDY OF PATENT MEDICINE VENDORS IN BIRNIN-KEBBI.

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ABSTRACT

Background: *Patent medicine vendors are major providers antimalaria treatment in Nigeria. The management of malaria by this informal sector of healthcare delivery is however dominated by negative practices. This study determines the influence of training on antimalaria treatment practices of patent medicine vendors.*

Methods: *Fifty-five patent medicine vendors selected through a multistage sampling technique in Birnin-Kebbi were recruited into the study. Their baseline treatment practices were determined and the negative ones identified. Intervention training was instituted and its impact assessed using a interviewer-administered questionnaire. Simulated visit mystery client survey which involved direct observation of patent medicine vendors practice was conducted after the intervention and the results compared with self reported post intervention practices.*

Results: *The negative practices identified included inappropriate dosage regimen, frequent unnecessary use of injectables and alteration of physicians' prescriptions. Following the intervention training of the patent medicine vendors, the overall appropriate treatment practice score rose from baseline value of 3.6% to 45.5% (p<001). However, direct observation of treatment through mystery client survey showed no improvement, the appropriate treatment practice score being comparable to pre-intervention value (5.5% versus 3.6%; p>0.05) and significantly lower than the post training values (p<0.001). The results of the mystery client survey were comparable only to pre-intervention values, (5.5%) versus 2 (3.6%); p>0.05) and was significantly lower than the post intervention values (p<0.0001). Profit was the core factor underlying the negative practices among the patent medicine vendors.*

Conclusion: *Though single intervention training improves the knowledge of patent medicine vendors on the treatment of malaria, gaps persisted between knowledge and practice. Continuous training of this group of informal healthcare givers is recommended.*

Keywords: *Patent medicine vendors, malaria treatment, intervention training.*

INTRODUCTION

Malaria represents one of Africa's greatest health challenges being a leading cause of mortality in children[1-3]. A key component of malaria control measures in Roll Back Malaria strategy (RBM) is malaria case management[3]. In Nigeria patent medicine vendors were licensed to operate with a view to bridging the accessibility problem in health care. Formal training was, however, not required prior to the licensing of patent medicine vendors. Nonetheless, ease of access, low cost of treatment and poor health-seeking behaviour of the population have made them major providers of treatment for common ailments including malaria[4]. The Roll Back Malaria Programme emphasizes community participation, partners hip and country-specific measures to combat malaria. If these must be achieved, the relevance of PMV can not be ignored because they treat over 50% of malaria cases.[3] The treatment practices of the PMV has however been found to be deficient and inappropriate[5]. There is therefore the need to improve their knowledge in case management of malaria. This study determines the influence of training on the antimalaria practices of patent medicine vendors in Birnin-Kebbi, Nigeria.

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METHODS

Birnin Kebbi, the capital of Kebbi State is a north-western Nigerian city, with a population of 228,265[6] and comprised mainly of Hausa and Fulani tribes. It is in a malaria endemic area. The predominant occupation is subsistent farming. The literacy rate and health care access are low with values of 33.2% and 37.1%, respectively[6]. These, in addition to the low socio-economic status of the population, have made informal health sector especially patent medicine practice a common source of health care delivery. Fifty-five registered PMV were selected by multi-stage sampling technique involving stratification and

computer generated table of random numbers. A pre-tested structured, interviewer administered questionnaire, adapted and modified from a training manual for management of malaria in Nigeria[7,8] was used to assess their malaria treatment practice, before and after intervention training. Baseline assessment of the treatment practice of the PMV was made and wrong practices were identified. Intervention training was given and its impact on these practices determined. The intervention included education on appropriate treatment of malaria given in two sessions of lectures, discussion and demonstrations, each session lasting for two hours at three weeks interval. Parameters used in assessment included choice of anti-malarial drug, dosage adequacy (in terms of dosage form, dosage strength, interval and treatment duration), compliance with doctors' prescription, pre-medication counseling and referral practices. Appropriate practice was defined as the correct choice of first-line drug in adequate dosage (Strength, interval and duration). Each correct answer in the questionnaire is allocated 1 mark. The average correct score is obtained for each aspect of the practice.

As an additional method of post intervention training assessment, simulated visits-mystery clients survey (MCS) was done. Twenty-two research assistants were divided into 11 pairs. Each group visited five patent medicine shops; one made direct complaints of malaria symptoms to the patent medicine vendor and the other presented a simulated physician's prescription. Each prescription included a stat dosage of intramuscular promethazine (phernegan). The clients assessed the knowledge of PMV on administration of injection and their willingness to administer it. The MCS determined subjects' anti-malaria practices were scored.

Data analysis was done using Epi-info computer software, version 3.3.2 (2005). Chi-square and where appropriate, Fisher Exact tests were used to compare proportions. Student t test was used to test the difference between two means. All observations were estimated at 5% level of significance at 95% confidence interval.

RESULTS

Socio-demographic characteristics of the PMV. The entire PMV bit one were males aged 32.8 $\pm$ 9.5 years (range 17-55 years) and had practiced for 7.6 $\pm$ 5.7 years with no previous intervention training. Over 85% of them had secondary and post secondary education. Thirteen (23.6%) of the subjects were PMV Apprentices.

Anti-malaria treatment practice

The overall pattern of PMV treatment practice is shown in Tables 1, 2 3 and 4. The predominant choice of first-line drug was chloroquine (90.9% and 69.1%) at pre- and post-intervention training, respectively. The proportions of the PMV that administered adequate dosage of chloroquine to a child of five years at baseline were 81.8% (form), 3.6% (strength), 14.5% (interval), and 70.9% (duration). Corresponding values for artemeter-lumefantrine were 36.4%, 10.9%, 25.5% and 25.5%. Similar patterns were observed in the treatment of adult malaria. Following the intervention training, the knowledge of appropriate treatment practice improved markedly from 3.6% at baseline to 45.5% ($p<0.0001$).

The observed pattern of the PMVs' response to prescriptions, premedication counseling, referral and other practices are shown in Table 5. Statistically significant differences existed between pre- and post-intervention values in the knowledge of referral symptoms and practice of pre-medication counseling ($p<0.05$).

Simulated visit mystery client survey showed that the following anti-malarial drugs were available in the patent medicine shops: chloroquine, amodiaquine (Camoquine®), primaquine, Paludrine®, pyrimethamine, sulphadoxine/pyrimethamine (Fansidar®), halofantrine (Halfan®), mefloquine, artemether, artesunate and artemisinin-based combination drugs (e.g. Coartem®)

The post intervention and mystery clients' visits assessment are compared in Tables 4, 5 and 6. Mystery client survey determined appropriate antimalaria practice score compared favourably with pre-intervention values (5.5% versus 3.6%; $p>0.05$) but was significantly lower than the to the post-intervention value of (5,5% versus 45.5%; $p<0.0001$).

Key negative practices identified included inappropriate choice of drugs, inappropriate dosage regimen, unnecessary use of injections, and alteration of prescriptions and non referral of difficult cases.

DISCUSSION

This study shows as previously observed[9,10] that PMV is almost exclusivel an occupation for

Table 1: Prescription pattern of PMVs for malaria treatment of Adults.

Parameter	Chloroquine	Fansidar	Coartem
1st choice of anti-malaria drug	41 PMVs	9 PMVs	5 PMVs
Preferred dosage form	Injection	Tab	Tab
Average dosage strength prescribed	5ml	3 tablet	2 tablets
Average dosage interval prescribed	Twice daily	Once daily	Once daily
Average treatment duration	2 days	1 day	5 days

Table 2: Prescription pattern of PMVs for malaria treatment of children 1-5 years old.

Practice parameter	Chloroquine	Fansidar	Coartem
1st choice of anti-malaria drug	50 PMVs	3 PMVs	2 PMVs
Preferred dosage form	Syrup	Syrup	Syrup
Average dosage strength prescribed	5ml	5 ml	5 ml
Average dosage interval prescribed	Thrice daily	Once daily	Once daily
Average treatment duration	5 days	1 day	5 days

Table 3: Appropriateness of PMVs' malaria treatment practice.

Practice	***Pretest*** Appropriate practice No (%)	**Post-test No** Appropriate practice No (%)	***p value***
Right choice of first line anti-malaria drug	5 (9.1%)	17 (30.9%)	0.01
Right dosage form	20 (37.0%)	49 (89.1%)	<0.001
Right dosage strength	5 (9.1%)	26 (47.3%)	<0.001
Right dosage interval	8 (14.5%)	32 (58.2%)	<0.001
Right treatment duration	15 (27.3%)	44 (80.0%)	<0.001
Appropriate Practice	2 (3.6%)	25 (45.5%)	<0.001

Table 4: Comparison of appropriateness of treatment regimen during pre, posttest and mystery client survey.

Practice	Pretest No (%)	Post-test No (%)	MCS No (%)
Right choice of first line anti-malaria drug	5 (9.1)	17 (30.9)	7 (12.7)
Right dosage form	20 (37.0)	49 (89.1)	45 (81.8)
Right dosage strength	5 (9.1)	26 (47.3)	20 (36.4)
Right dosage interval	8 (14.5)	32 (58.2)	31 (56.4)
Right treatment duration	15 (27.3)	44 (80.0)	10 (18.2)
Appropriate Practice	2 (3.6)	25 (45.5)	3 (5.5)

Appropriate Practice at Post-test vs. MCS: $p < 0.0001$ while Appropriate Practice at pretest vs. MCS: $p = 1.0000$

Table 5: Comparison of general treatment practices of the PMVs in pre and posttest and mystery client survey.

Other practices of the PMVs	Number (%) of subjects (n=55)*		
	Pretest	Post-test	MCS
Action taken when customer cannot afford cost of doctors' prescriptions:			
Defer treatment	5 (9.1%)	6 (10.9%)	0 (0.0%)
Give cheaper drugs	11 (20.0%)	9 (16.4%)	20 (36.4%)
Give credit	13 (23.6%)	27 (49.1%)	0 (0.0%)
Reduce dose	24 (43.6%)	6 (10.9%)	35 (63.6%)
Others	2 (3.6%)	7 (12.7%)	0 (0.0%)
Action taken when customer cannot afford cost of PMVs' Prescriptions:			
Defer treatment	0 (0.0%)	7 (12.7%)	0 (0.0%)
Give cheaper drugs	24 (43.6%)	21 (38.2%)	27 (49.1%)
Give credit	11 (20.0%)	19 (34.5%)	0 (0.0%)
Reduce dose	15 (27.3%)	7 (12.7%)	28 (50.9%)
Others	0 (0.0%)	1 (1.8%)	0 (0.0%)
Knowledgeable of referral indicator symptoms	34 (61.8%)	50 (90.9%)	-
Referred patient in the past 1 month	2 (3.6%)	1 (1.8%)	-
Pre-medication counseling	11 (20%)	45 (81.8%)	5 (9.1%)
Ability to read doctors' prescription	30 (54.5%)	40 (72.7%)	42 (76.4%)
Full compliance with doctors' prescription	10 (18.2%)	12 (21.8%)	8 (14.5)
Ability to administer injection	20 (36.4%)	20 (36.4%)	40 (72.7%)
Willingness to administer injection	17 (30.9%)	20 (36.4%)	34 (61.8%)

* Each PMV had one or more options. N/A means not applicable (not assessed by MCS)

Table 6: Premedication interview and counseling offered by PMV.

Pre-medication practice	Number (%) of subjects (n=55)*		
	Pretest	**Post-test**	**MCS**
Pre-medication counselling			
Age of client (for children)	2 (3.6%)	18 (32.7%)	N/A
Drug reaction	0 (0.0%)	3 (5.5%)	7 (12.7%)
Illness duration	9 (16.4%)	7 (12.7%)	1 (1.8%)
Malaria symptoms	14 (25.5%)	30 (54.5%)	21 (%)
Other common illnesses	2 (3.6%)	1 (1.8%)	8 (14.5%)
Pregnancy	1 (1.8%)	2 (3.6%)	0 (0.0%)
Previous medication	8 (14.5%)	19 (34.5%)	20 (36.4%)
Ensure compliance	0 (0.0%)	19 (34.5%)	0 (0.0%)
Return if fever persists	3 (5.5%)	15 (27.3%)	2 (3.6%)
See doctor if no improvement or symptoms worsen	5 (9.1%)	27 (49.1%)	0 (0.0%)
Eat before medication	6 (10.9%)	10 (18.2%)	0 (0.0%)
Others	1 (1.8%)	0 (0.0%)	0 (0.0%)

the males. Male dominance in the setting of the current study might have been accentuated by restriction of female out door activities. The study also demonstrated and corroborated previous reports[5, 11-15] that training of PMV improves their knowledge of anti-malaria appropriate treatment practice which rose from baseline value of 3.6% to 45.5%. However, mystery client survey showed a wide gap between PMV knowledge and actual practice or implementation. This is consistent with as previous report on this subject[12]. Factors other than knowledge may be involved in the PMVs negative practices.

Majority of the PMV still recognised chloroquine as the first line anti-malaria drug despite the fact that the national policy on this issue has since changed in Nigeria. This is an indication of lack of awareness on the current management of malaria on the part of PMV and the need for training and retraining of these informal health care givers. It also suggests poor community participation in malaria case management as envisaged in the Roll Back Malaria Strategy.

Though inappropriate choice of anti-malaria and inappropriate dosage strength, dosage interval and treatment duration could partly be due to lack the deficiency in the knowledge of PMV, considerations for profit, cost, patients' preference were the reasons adduced by the PMV. In previous studies lack of knowledge was found to be responsible for dosage inadequacies and other negative practices [5, 11, 12]. The need for more sales and profit may explaing the frequent alteration or non compliance to the physician's prescriptions. The implications of these practices with respects to treatment failure and development of resistance can not be overemphasised. It is therefore on th long term not cost effective.

The observed wide gap between the knowledge of PMV and and actual could also be largely profit driven. The observed increase in the number of PMVs willing to administer injections as well as the absence of an improvement in the number of referrals even after training may be due to increased self confidence arising from the training. It is nonetheless worrisome. Some previous studies have shown a significant decline in referral of children with fever and convulsions after the intervention training even though PMVs showed significant improvement in their knowledge of certain signs of severe illness[12]. In that same study, informing caregivers of danger signs of severe illness by the PMVs fell from 15% to 10% after training suggesting that PMV training could have some negative impact in some aspects of PMV practice. However,

Table 7: PMVs' reasons for altering prescriptions.

Reason for altering prescription	No (%) of Subjects (n=55)*
Patient is poor	30 (54.5%)
Patients' wish/demand	25 (45.5%)
The substituted drug does the same work	15 (27.3%)
Need to make sales	45 (81.8%)
Don't see anything wrong with that	11 (20.0%)
Fear of losing customers	19 (34.5%)
Want to help people	21 (38.2%)
Others	6 (10.9%)

the short duration of the training and the educational background of the PMVs may affect comprehension of all the training contents.

CONCLUSION

In conclusion malaria treatment practices of the PMVs were grossly deficient. While training intervention improved their knowledge of appropriate antimalaria treatment practice, such knowledge was not translated into actual practice. Continuous training of the PMV is recommended.

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