

Improving Private Drug Sellers' Practices for Managing Common Health Problems in Nepal

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ABSTRACT

Background: In most Asian countries, 50 - 90% of pharmaceutical sales are made in private drug outlets, by personnel with some training in drugs but not for the treatment of common health problems. The objective of the study was to determine effects of focused training for private drug sellers to improve practices in treating acute respiratory infections and diarrhoea in children, and anaemia in pregnancy in Nepal.

Methods: Randomized controlled, four way nested design study incorporating four interventions for drug retailers in both hill and *terai* districts. One group received mailed printed educational materials followed by mailed feedback; a second received small group training followed by feedback; a third received small group training only; and a fourth, the control group, received no intervention. Surrogate customer method was used to assess practices. Outcomes were measured using multivariate linear regression.

Results: A significant increase in the asking of key history questions, recommendation (prescribing by drug retailers) of cotrimoxazole, and advice-giving for pneumonia; a significant increase in ORS recommendation, and advice giving for diarrhoea including the avoidance of antidiarrhoeals; and a significant increase in asking key history questions and recommending appropriate products in pregnancy cases.

Conclusions: Training intervention as well as training followed by practice feedback was effective in improving the management of common illnesses and pregnancy by private drug sellers.

Keywords: drug sellers; multiple interventions

INTRODUCTION

Self-treatment through modern medicines is well documented throughout developing world. In Asian countries, 50-90% of pharmaceutical sales are made in private retail outlets.¹⁻⁴

Up to 70% of illnesses are self-treated with modern pharmaceuticals^{1,2,5-9} purchased in private outlets, and even prescriptive products are sold without prescription.^{6,8,10,11}

In developing countries, consumers prefer retail pharmacies as primary source of care but appropriateness of dispensing (drug recommendation) is found to be

far from acceptable.¹²⁻¹⁹ Recommendation without prescription by retailers often results in irrational use and waste of resources.²⁰⁻²⁶

In Nepal, about 90% of pharmaceuticals used are dispensed by more than 8,000 retailers located throughout the country, mostly managed by non-pharmacists known as professionals.^{27,28}

Because of the demonstrated capacity of DDA/MOHP to train retailers, we sought to determine the effect of a focused training in improving drug recommendation, correct advice, and referral practices.

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METHODS

The study was a randomized controlled trial conducted in 12 districts located in the hill and *terai* ecological zones of three geographic regions in Nepal. Within each region, two districts were randomly selected from among those lying in the more northern, less accessible hill zones, and two districts from those lying in the more southern, more accessible *terai* zones.

Within each district, drug sellers were selected in clusters from randomly chosen bazaars, or market areas. In total, 342 retailers were included in the baseline assessment, 325 in the two month follow-up assessment and 314 retailers in the six month follow-up assessment.

The study had a nested four-way design with pre-post comparisons. The 12 study districts were randomly assigned to one of four groups: small group training only; small group training followed by mailed feedback of practice data one month later; mailed printed educational materials followed by mailed feedback on individual and from the region recommendation practices one month later; and a control group that received no intervention. One of the two *terai* and one of the two hill districts in each region was first assigned to receive training and the other to receive no training. Then half of the drug sellers in both the training and non-training districts were randomly assigned to receive feedback, resulting in the four study groups described above. The remaining half of the drug sellers from both the groups served as control group.

The intervention aimed to improve care for three clinical conditions commonly presented for treatment in drug shops in Nepal: acute respiratory infection (ARI) in children, acute diarrhoea in children, and anaemia in pregnant women. The specific practices emphasized in the intervention educational materials are listed in (Table 1). These practices were also assessed to evaluate the impact of the intervention at two months and six months after the intervention.

The training intervention was conducted for a small group (10-15) of drug sellers within each district designated to receive training and training plus feedback, with two to three training conducted per district. Training course contents were based on local recommendations for treatment of the three target conditions as well as on the findings of focus group discussions (FGDs) carried out during a formative study. The printed materials mailed to the feedback-only group were sent by registered mail after the completion of training and included the educational materials used in the training. The feedback consisted of data on the individual drug seller's practices, evaluated during surrogate customer

encounters and comparing individual practices with data from peers as well as with recommended practices.

For all four groups including control the retailers' knowledge about key symptoms of each health condition, when to refer serious cases and acceptable treatments were assessed through individual interviews conducted in their shops using structured questionnaires. The interviews were conducted after the surrogate visits, as mentioned below. The interviews were conducted at baseline and six months after the intervention. No interview was conducted two months after the intervention. The surrogate customer method was used to assess the retailers' actual recommendation and advice-giving practices.^{19,30} Three surrogate customer visits, one for each study condition, were made to all drug shops in the sample during baseline, and two months and six months after the intervention.

The interview questionnaire focused on three major areas: knowledge about key symptoms to differentiate mild and serious illness; knowledge about when to refer cases to health institutions or health workers for treatment; and reported treatment practices. The baseline questionnaire also included questions on educational level, languages spoken, and other relevant socio-economic indicators.

Surrogate customers were trained to present standardized case scenarios to assess treatment practice. For a child with cough, the customer was trained to describe a case with classic symptoms of severe pneumonia, requiring at least antibiotics and preferably referral. The child was first described as having cough and cold for three days, and if asked, the customer mentioned a runny nose; fever; chest in-drawing; difficult and very rapid breathing; lethargy; not taking fluids well; cyanosis; and previous treatment with home cough mixture. For a child with diarrhoea, the case described involved simple watery diarrhoea with 5-6 motions during the previous day, and probably needing only ORS. If asked, the surrogate described the child as three years old; with no vomiting, fever, blood, or mucous; eating and playing a little less than usual; a little weak but wanting to drink; and with no medicine used. Finally, the customer presenting as the husband of a pregnant woman needing an iron-folate preparation described his wife as pale-looking and feeling weak. If asked, she was described as seven months pregnant with her second child and unspecified difficulties during her first pregnancy; with no vomiting; taking no medicine; and with poor appetite.

After each visit, the surrogate customer was interviewed by the supervisor to complete a structured debriefing form developed and validated for each target condition during field testing to collect key elements

of information about communication with the drug seller and the treatments recommended during the visit. The surrogate customer purchased all of the drugs recommended by the drug seller.

We used multivariate linear regression methods to assess the impact of the intervention on changes from baseline to follow-up in knowledge and reported recommending practices of the three study groups and the control group. The outcome variables in these analyses were the Symptom Knowledge Index, the Referral Knowledge Index, and the Recommendation Quality Index derived from interviews with shop attendants. The key predictor variables in all models were indicators for whether the drug shop in which the respondent worked was assigned to a group receiving training, to a group receiving feedback, as well as an interaction term to look at the combined effects in shops that received multiple interventions. For simplicity of interpretation, the interaction term was dropped in models in which it was not significant. All models included terms to adjust for baseline differences between the study groups as well as for overall changes in the scores between the two assessments. We also adjusted for key demographic variables found to be associated ($p < 0.10$) with the baseline values of the study outcome in univariate models. Candidate variables included zone (terai/hill); respondent age, gender, and educational level; whether the respondent had received the government orientation training or a refresher course; and whether the respondent was the owner of the shop.

We used logistic regression models to determine the effect of the intervention on the actual practices of shop attendants observed during simulated customer visits. Outcome variables were based on specific messages included in the intervention materials (Table 1) and included indicators for whether the shop attendant assessed the key symptoms and danger signs, communicated recommended advice to the patients, and followed the recommendations for products to be sold or avoided for each condition.

Table 1. Key clinical and behavioural issues addressed in the intervention materials for the three target health conditions.

Topic	Main Issues Addressed in the Intervention Materials
Diarrhoea/Dehydration	
Main symptoms	Child under 5 with frequent loose stools, blood or mucous in stool
Key danger signs	Not passing urine for 6 hours, unable to drink, deep sunken eyes
Key advice to give	Use ORS frequently, increase other liquids and food, continue breast feeding
Recommended practices	Sell ORS, do not sell antimicrobials or anti-emetics, refer to health institution or qualified health worker if danger signs present
Acute Respiratory Infection/Pneumonia	

Main symptoms	Child under 5 with running nose, cough and mild fever
Key danger signs	Chest in-drawing, fast breathing or difficult breathing
Key advice to give	Use home remedies, clean child's nose, continue breast feeding, give more liquid and food than usual, visit health institution or qualified health worker if danger signs appear
Recommended practices	Sell paracetamol if fever, sell no antibiotics unless fast breathing, sell five days of cotrimoxazole if danger signs, do not sell cough medicines
Anaemia in Pregnancy	
Main symptoms	Pale face, lethargic, fatigue, excessive vomiting in a pregnant woman
Key danger signs	Swelling of face, hands and feet, pain in the lower abdomen and back, bleeding
Key advice to give	Regular check up from health institution, visit health institution if danger sign or no improvement in symptoms after one month treatment with iron preparation and nutritious food, tetanus toxoid
Recommended practices	Sell iron and folic acid for at least 3 months, sell no drug other than iron and folic acid, refer to health institution or qualified health worker if danger signs present

All models controlled for the value of the outcome measure for the condition in question observed in that shop during the baseline simulated visit. As in the linear regression models above, the terms of interest were indicators for inclusion in the training group, in the feedback group, and an interaction term if the shop was part of both interventions. Again the interaction term was dropped if it was not significant.

RESULTS

Baseline Characteristics of the Study Groups

Baseline characteristics of the shops and interview respondents and key baseline practices in the four study groups are shown in (Table 2). Two-thirds of the shops in all groups were located in the terai. Shops employed an average of 2.1 counter attendants (maximum of 6), with about 25% of shops having only a single employee. Most survey respondents were male with an average age of 33, had 10 years of education, over 80% were owners of their shops, and about two-thirds had participated in government orientation training.

Table 2. Comparison of baseline shop and respondent characteristics, knowledge about target conditions, and practices of study groups.

Baseline Characteristic	Training Only	Feedback Only	Training and Feedback	Control
Characteristics of drug shops				
No. of drug shops	84	86	86	86
Percent located in <i>terai</i> zone	66%	66%	71%	72%
Average No. of staff in shop	2.0	2.0	2.1	2.2
Characteristics of survey respondents				
Average age	33	33	33	34
Percent male	89%	88%	94%	92%
Percent who own the shop	83%	83%	81%	81%
Percent with >10 years schooling	79%	69%	71%	80%
Percent with orientation training *	59%	63%	71%	79%
Scores on knowledge indexes				
Symptom Knowledge (range 0 - 60)	24.9	25.3	25.7	32.0
Referral Knowledge (range 0-30)	6.1	6.1	7.3	6.4
Recommending Quality (range -5 - +6)	1.0	1.1	0.7	0.5
Key practices				
Asked 1+ key symptoms of pneumonia	2%	3%	2%	5%
Sold cotrimoxazole for pneumonia	5%	8%	6%	7%
Asked 1+ key symptoms of dehydration	2%	12%	5%	6%
Sold ORS for diarrhoea	40%	37%	35%	34%
Asked 1+ key danger signs in pregnancy	51%	60%	53%	57%
Sold iron-folate for pregnant woman	71%	71%	58%	67%

* Government of Nepal course to orient drug sellers to good drug stock keeping and dispensing practice

Knowledge about symptoms and danger signs, reasons for referral, and dispensing quality were very comparable across study groups. On the whole, average knowledge about symptoms was much higher than knowledge about reasons for referral.

Overall, dispensing practices for simulated customers seeking care for children with pneumonia were very poor, with almost no questions asked in any of the study groups to ascertain key symptoms or danger signs, and very low rates of selling cotrimoxazole, the recommended practice. Questioning about key symptoms for diarrhoea/dehydration was equally poor, although slightly better in the feedback-only intervention group. About a third of the drug sellers in all groups sold ORS for a case of diarrhoea. Practices for managing care in pregnant women were much better in all groups. Over half of the men presenting as simulated customers seeking care for their pregnant wives were asked relevant questions about the pregnancy, and 58-71% in all groups were sold iron-folate preparations.

Changes in Knowledge and Reported Practice

Results from multivariate regression models examining the impact of the intervention on knowledge and reported practice are shown in (Table 3). Shop ownership and location in the *terai* zone were important predictors in all models. On the whole, baseline differences between study groups were not significant except for somewhat higher baseline scores in the training groups on the Recommendation Quality Index.

Overall, being in one of the two training intervention groups resulted in significant post-intervention improvements in knowledge about symptoms and danger signs among interview respondents, with average adjusted score increases of 11% (2.53 points). Training was also associated with even larger significant improvements in knowledge about referral signs, with average adjusted gains of 3.76 points, or a more than 50% increase over baseline scores. Being in the feedback group was not associated with improvements in knowledge on either index, and neither intervention was associated with improvement in reported recommending quality.

Changes in Recommending Practices

The impacts of the training and feedback interventions on recommending practices for the three target problems are summarized in (Table 4). For treatment of a simulated case of pneumonia, in comparison to the control group, training was associated with a significant increase in the odds of a counter attendant asking about rapid breathing or chest in-drawing (OR=7.9, 95% Confidence Interval = [1.8, 35.6]) and in giving at least

one item of recommended advice (OR=3.0, CI=[1.6,5.3]). There were no significant increases due to training in selling an antibiotic to the simulated customers, but there was a significant increase in the odds of selling cotrimoxazole (2.1, [1.0,4.3]). Feedback had no independent effect on any of the practice measures, but was associated with a significant increase in the odds of not selling cold medicines in the group that received both training and feedback (2.8, [1.0,7.8]).

Table 3. Impacts of training and feedback interventions on knowledge about symptoms, about the need for referral, and on reported practices.

	Estimate	Std Error
Symptom Knowledge (range 0 to 60)		
Intercept	23.70	
Shop owner	1.34	0.66 **
Terai zone	1.03	0.56 *
Baseline difference in training group	-0.57	0.72
Baseline difference in feedback group	0.33	0.72
Overall change at month 6	-1.02	0.89
Effect of training intervention	2.53	1.03 **
Effect of feedback intervention	0.27	1.03
Referral Knowledge (range 0 - 30)		
Intercept	5.95	
Age	0.05	0.03 *
Male respondent	-1.87	0.92 **
Previous government orientation training	-0.75	0.57
Shop owner	1.51	0.73 **
Terai zone	0.07	0.55
Baseline difference in training group	-0.95	0.70
Baseline difference in feedback group	0.57	0.70
Overall change at month 6	0.72	0.87
Effect of training intervention	3.76	1.01 and
Effect of feedback intervention	-0.05	1.00
Recommending Quality (range -5 to +6)		
Intercept	0.29	
Age	0.01	0.01 *
Shop owner	0.23	0.15
Terai zone	-0.47	0.12 and
Baseline difference in training group	0.39	0.15 *
Baseline difference in feedback group	0.16	0.15
Overall change at month 6	0.47	0.19 *
Effect of training intervention	0.32	0.22
Effect of feedback intervention	-0.10	0.22

* p<0.10 ** p< 0.05 and p<0.01

Table 4. Impact of training and feedback interventions on drug seller practices measured in simulated purchase surveys six months post-intervention.

Condition	Recommended Practice	Odds Ratio (95% Confidence Interval) from logistic regression models and	
		Training	Feedback
Pneumonia	Asked key history questions	7.9 (1.8, 35.6) **	0.7 (0.2,1.9)
	Any advice given	3.0 (1.6, 5.3) **	0.9 (0.5,1.6)
	Refer to health worker	1.1 (0.6,1.0)	0.9 (0.5,1.7)
	Sells an antibiotic	1.4 (0.8,2.4)	1.3 (0.8,2.3)
Diarrhoea	Sells co-trimoxazole	2.1 (1.0,4.3) *	1.1 (0.5,2.1)
	Sells analgesic	1.1 (0.6,2.2)	1.4 (0.7,2.6)
	Does not sell cold medicine	1.3 (0.8,2.1) #	1.0 (0.6,1.7)
	Asked key history questions	1.0 (0.2,5.1)	0.9 (0.2,4.6)
Pregnancy	Any advice given	2.2 (1.3,3.8) *	1.1 (0.6,1.9)
	Does not refer to health worker	0.9 (0.4,2.1) #	1.1 (0.5,2.6)
	Sells ORS	2.4 (1.4,4.1) **	1.0 (0.6, 1.6)
	Does not sell antibiotics	0.7 (0.4,1.1)	0.7 (0.5,1.2)
Pregnancy	Does not sell antidiarrheals	1.7 (1.0,2.7) *	1.2 (0.7,1.9)
	Asked key history questions	1.7 (1.1,2.7) *	1.3 (0.8,2.0)
	Any advice given	1.3 (0.8,2.1)	1.2 (0.8,2.0)
	Refer to health worker	1.3 (0.7,2.3)	1.2 (0.6,2.1)
Pregnancy	Sells iron-folate	0.7 (0.4,1.2)	1.3 (0.8,2.2)
	Does not sell vitamins	2.3 (1.3,4.1) **	1.1 (0.7,2.0)

All models control for baseline level of dependent variable and for location of drug shop in the *terai* ecological zone

* p<0.05 ** p<0.01

Not significant but interaction with feedback group is significant p<0.05

Shops in the training groups also demonstrated significant improvements in several key measures of recommending practices for diarrhoea in children. Compared to controls, the odds of giving recommended advice more than doubled (2.2, [1.3, 3.8]), as did the odds of selling ORS (2.4, [1.4, 4.1]). The odds of counter attendants not recommending or selling an anti-diarrhoeal also increased significantly (1.7, [1.0, 2.7]). Once again the feedback intervention had no observable effects.

Finally, the training intervention also resulted in some significant improvements in care for pregnant women. Attendants in the training groups had higher odds (1.7, [1.1, 2.7]) of asking about the key potential problems experienced during pregnancy (Table 4). Sales of iron folate, which were already high at baseline, did not change. However, the training only group exhibited a significant increase in the odds of not selling vitamins (2.3, [1.3,4.1]), in line with the training message discouraging this practice. As usual, the feedback intervention had no impacts.

DISCUSSION

In ARI, the impact of training in improving drug sellers' practices on quality of history taking, cotrimoxazole recommendation and number of questions asked in history taking continued up to six months. Training combined with audit feedback had a similar effect.

In the case of diarrhoea, the impact of training in improving drug sellers' practices with respect to ORS recommendations, discouragement of antidiarrheal recommendations, and number of drugs dispensed per customer continued up to six months. However training combined with audit feedback improved practice up to six months for the recommendation of ORS only.

In the case of anaemia in pregnancy, the positive impact of training in improving drug sellers' practices on the quality of history taking and number of questions asked in history taking continued up to six months. Training combined with audit feedback showed no improvement in practice at the six-month mark.

From our baseline assessment, it is clear that the overall quality of practice by drug sellers in managing ARI, diarrhoea, and anaemia in pregnancy is very poor. Although about 60% of drug sellers in Nepal have received the government's 72-hour drug retailers' orientation training, the remaining counter attendants working in these settings have received essentially no training in how to interact with or advise customers from a public health perspective. Moreover, the government orientation training focuses on basic information about commonly used drugs, storage, dispensing procedures,

ethics and laws, and some basic information about the primary health care concept. Unfortunately, it does not cover the essentials of managing common illnesses, namely, adequate communication to determine the nature of the customer's health problem, referral of serious cases to trained health workers, advice to customers about prevention and home management, and key recommended and discouraged sales practices.

Although the training component of our intervention had significant effects in improving some of these practices, the overall changes we observed were small. In order to staff the participating shops so that they could remain open, most of the training sessions were attended by only a single drug seller from each shop. However, on average, there were two or more persons working in each shop dispensing drugs. We do not know the extent to which intervention materials and messages were shared with other employees when drug sellers returned from the training. Furthermore, the persons who received the training might no longer have worked in the shops during the follow-up assessment, or, even more likely, they were not the ones who recommended to the simulated clients, who were trained to interact with whoever was present at the time of their visit. For these reasons, we might expect that any effects observed are underestimates of the changes among the drug sellers who actually participated in the programme, although the effects accurately reflect the overall level of impact of the program in the sample drug outlets.

The mailed feedback included in this intervention demonstrated no independent impact on knowledge or practice, and added nothing to the effects of the training intervention.

CONCLUSIONS

This targeted training intervention has shown the promise of such a strategy for improving the management of common illnesses by counter attendants working in drug outlets in Nepal. We believe that the basic orientation program already required for these individuals should incorporate targeted material on history taking, advice giving, referral skills, and key recommendations about sales practice for common health problems. We have demonstrated that two and half days of such targeted training can have significant impacts on practice. We therefore recommend specific problem based focused training for pharmacy outlets. The public health value of dispensing pharmacy outlets managing common problems deserves government recognition. The Ministry of Health and Population should establish standards for providing this type of service and monitor the quality of service on an ongoing basis.

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