

## Original Research

# Impact of educational intervention on knowledge of dispensers working at community pharmacies in Pakistan

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### ABSTRACT\*

**Objective:** To evaluate the impact of training of dispensers on knowledge of dispensers working at community pharmacies in context to storage temperature, prescription terminologies and status of medicines in Islamabad, Pakistan.

**Method:** A randomized, controlled, blinded intervention study was designed and implemented. Before the implementation of intervention, a baseline study was performed to assess the knowledge of dispensers working at community pharmacies. The study population included all community pharmacy outlets in Islamabad. Pharmacies of Islamabad which were visited in pre intervention phase ( $n=118$ ) were divided into two geographical regions: A (intervention) and B (control). Thirty pharmacies were randomly selected from each region. Keeping in view the results of the baseline study an educational intervention was designed to improve the knowledge of dispensers working at community pharmacies in Pakistan. **Results:** A significant difference in the overall knowledge of dispensers was observed between the pre-post intervention groups. Knowledge of dispensers regarding storage of drugs, prescription terminologies and status of drugs was improved after the training. On the other hand no significant difference was observed between the pre-post control groups.

**Conclusion:** The study has highlighted that improvements in knowledge of dispensers working at community pharmacies are possible through suitable interventions. But, results of interventions can only be sustainable through continuous monitoring and reinforcement of the training.

**Keywords:** Pharmacists' Aides; Professional Practice; Health Knowledge, Attitudes, Practice; Pharmacies; Pakistan

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### IMPACTO DE UNA INTERVENCIÓN EDUCATIVA SOBRE EL CONOCIMIENTO DE LOS DISPENSADORES QUE TRABAJAN EN FARMACIAS COMUNITARIAS EN PAKISTÁN

### RESUMEN

**Objetivo:** Evaluar el impacto de la formación de los dispensadores sobre el conocimiento de estos dispensadores que trabajan en farmacias comunitarias en relación a la temperatura de almacenamiento, terminologías de medicamentos de prescripción y *status* de los medicamentos en Islamabad, Pakistán.

**Métodos:** Se diseñó e implementó un estudio de intervención controlado, aleatorizado y ciego. Antes de la implantación de la intervención, se realizó un estudio de base para evaluar el conocimiento de los dispensadores que trabajaban en farmacias comunitarias. La población en estudio incluyó todos los establecimientos de farmacia comunitaria de Islamabad. Las farmacias de Islamabad que fueron visitadas en la fase pre-intervención ( $n=118$ ) fueron divididas en dos áreas geográficas: A (intervención) y B (control). Treinta farmacias fueron aleatoriamente seleccionadas en cada región. Con la experiencia del estudio basal, se diseñó una intervención educativa para mejorar el conocimiento de los dispensadores que trabajan en farmacias comunitarias en Pakistán.

**Resultados:** Se observó una diferencia significativa pre- y post-intervención en el conocimiento general de los dispensadores en el grupo intervención.

Después de la formación, se mejoró el conocimiento de los dispensadores en relación a almacenamiento de medicamentos, terminología de medicamentos de prescripción y *status* de los medicamentos. Por el contrario, no se observó diferencia significativa pre-post en el grupo control.

**Conclusión:** El estudio ha remarcado que, a través de intervenciones adecuadas, se pueden conseguir mejoras en el conocimiento de los dispensadores que trabajan en farmacias comunitarias. Pero, los resultados de las intervenciones solo pueden ser sostenibles mediante una monitorización continua y un aumento de la formación.

**Palabras clave:** Auxiliares de Farmacia; Ejercicio profesional; Conocimientos, Actitudes y Práctica en Salud; Farmacias; Pakistán

## INTRODUCTION

Knowledge of dispensers is an important prerequisite for provision of quality services at community pharmacies but may not always reflect in their real practices.<sup>1,2</sup> Changing the knowledge, behavior and practices of dispensers working at community pharmacies might be a slow process but the likelihood of achieving improvements exists.<sup>3</sup> Improving dispensing practices at community pharmacies is possible by using a mix of focused interventions.<sup>4</sup> Three types of interventions have been used including educational, managerial and regulatory, alone or in combination.<sup>5</sup> The literature suggests that the majority of dispensers are willing to learn and contribute towards rational dispensing and expressed the need for training.<sup>6-8</sup> The incentives reported for the dispensers to participate in intervention are uplift in social status, increase in their knowledge, increased ability to help their own families and earning better profits.<sup>9</sup> Education is the intervention most widely used for improving the practices of drug sellers across the world.<sup>10</sup>

It involves focused small group training, one on one educational training, peer-educators, in-service training, moderated group discussion, large group training, feedback or peer review.<sup>11,12</sup> Persuasive educational intervention enables behavior change by addressing barriers to change.<sup>13,14</sup> A study conducted in Nigeria, showed that it is possible to train a large number of drug sellers quickly and cheaply by using peer-educators.<sup>15</sup> Though educational interventions have been shown to be effective in some studies, variations exist depending on the scenario.<sup>13,16</sup> The present study aimed to document and compare the impact of educational intervention on knowledge of dispensers working at community pharmacies in Islamabad, Pakistan.

## METHODS

### Baseline Study

A randomized, controlled, blinded intervention study was designed and implemented. Before the implementation of intervention, a baseline study was performed to assess the knowledge of dispensers working at community pharmacies. The study population included all community pharmacy outlets in Islamabad selling allopathic medicines western or modern medicines including all over the counter and prescription only medicines, excluding herbal and homeopathic medicines. Any shop meeting these criteria was included in the sampling frame.

### Sampling of Pharmacies

A list of pharmacies was obtained from respective District Health Offices. The total population of pharmacies in Islamabad was 169. The sample size was calculated at 95% confidence interval by using Cochrane formula which came out to be 118. Simple random sampling was used to select the pharmacies from the list. For the purpose of interview the most experienced dispenser was selected from the pharmacy and structured

questionnaire was used to get information on knowledge of dispensers at these 118 pharmacies.

### Data Collection Tool

A structured questionnaire with coded responses and few open ended questions was designed by using the references of Drug Act of Pakistan 1976 and relevant rules under, Good Pharmacy Practices guidelines, International Pharmaceutical Federation (FIP) guidelines and inspection book of pharmacies used to get information regarding knowledge, qualification and experience of dispensers. Two Focus group discussions were carried out at different time intervals with four different groups of community pharmacist, drug inspectors (Government officials who inspect quality of drugs and legal requirements at community pharmacies by drug law 1976 Pakistan), academia and members of consumer groups (NGO). Each group comprised of three to four participants for the development, finalization, face and content validity of the data collection tool. Pilot testing was carried out on 12 pharmacies (10%) of total sample size before execution of the final study. The value of cronbach's alpha was 0.726 which was applied to assess the reliability and internal consistency of the tool. The structured questionnaire comprised of a total of 33 questions which included information on demographics, personal information, status in pharmacy, level of education, experience, in service training, storage temperature, prescription terminologies, status of medicines, views and problems about profession and suggestions for improvement. Data collection was planned and permission for survey was obtained from relevant drug inspectors. The study was also approved by the Research & Development wing of Drug Control Organization at Ministry of Health, Government of Pakistan. Local chapters of PCD (Pakistan chemist and druggist association) were also informed and consent was taken.

### Data Collection

Convenience sampling method was used to identify dispensers who responded to the questions listed in questionnaires. It was intended that a pharmacist with a bachelor's degree or diploma in pharmacy be interviewed. However, in cases where a pharmacist was unavailable, the most experienced dispenser was interviewed for the filling of knowledge assessment questionnaire.

### Results of Pilot Study

After data collection, data was analyzed by SPSS. The result of the study revealed that the qualification, knowledge and training of dispensers working at community pharmacies in Pakistan are inadequate and pharmacies are largely operated by non-qualified and untrained dispensers. The results of the study highlights that most of the dispensers are not qualified but have ample years of experience. Nevertheless, this experience of dispensers does not reflect in their better knowledge. The study results highlighted that 90 percent of drug sellers felt that they require training while 84 percent showed their willingness to participate if such opportunity arises.

Table1. Impact of training on knowledge of dispensers working at community pharmacies

Indicator	Knowledge of dispensers	Pre-intervention n = 30		Post-intervention n = 30		% difference
		n	%	n	%	
Medications to be kept in fridge	Correct	7	23.3	29	96.7	+73.4
Temperature range for vaccine storage	Correct	15	50	23	90	+40
Room temperature range	Correct	23	76.7	28	93.3	+16.6
Fridge temperature	Correct	16	53.3	28	93.3	+40
OTC (over the counter)	Correct	2	6.7	18	60	+53.3
POM (prescription only) medicines	Correct	0	0	13	43.3	+43.3
t.i.d (thrice a day)	Correct	19	63.3	28	93.3	+30
b.i.d (twice a day)	Correct	17	56.7	29	96.7	+40
q.i.d (four times a day)	Correct	14	46.7	24	80	+33.3
h.s (at night time)	Correct	10	33.3	24	80	+46.7
s.o.s (when required)	Correct	11	36.7	28	93.3	+56.6
p.r.n (as needed)	Correct	1	3.3	13	43.3	+40
Panadol® (Paracetamol)	Correct	22	73.3	29	89.7	+16.4
Brufen® (Ibuprofen)	Correct	21	70	28	93.3	+23.3
Dulcolax® (Biscodyl)	Correct	19	63.3	24	80	+16.7
Surbex T® (Multivitamin)	Correct	17	56.7	27	90	+33.3
Klaricid® (Clarithromycin)	Correct	20	66.7	29	96.7	+30
Lexotanil® (Bromazepam)	Correct	26	86.7	30	100	+13.3
Deltacortil® (Prednisolone)	Correct	26	86.7	29	96.7	+10
Septran® (Sulfamethoxazole)	Correct	11	36.7	26	86.7	+50
Fansidar® (Pyrimethamine and Sulfadoxine)	Correct	23	76.7	24	80	+3.3
Augmentin® (co-amoxiclave)	Correct	17	56.6	24	80	+23.4
Flagyl® (metronidazole)	Correct	9	30	21	70	+40
Lomotil® (diphenoxylate and atropine)	Correct	12	40	19	63.3	+23.3

### Designing & Execution of Interventional Study

Pharmacies of Islamabad which were visited in pre intervention phase (n=118) were divided into two geographical regions A (intervention) and B (control). From which thirty pharmacies were randomly selected from each region. The targeted group of the interventions was drug sellers. Keeping in view the results of the base line study an educational intervention was designed to improve the knowledge of dispensers working at community pharmacies in Pakistan. The results of the baseline study were shared with representatives of chemist and druggist association, drug inspectors, academia, drug sellers and community pharmacist. The focus, targets, contents and format of intervention was designed after a series of discussions with the above mentioned stakeholders. The contents of the training materials were developed from Drug Law, Good Pharmacy Practice guidelines, dispensing practice standards and discussion with drug inspectors. The format of a formal workshop was selected for training because it is the most common method used across the world for training drug sellers. After discussion with different stakeholders the name of the training workshop was recommended to be 'Modern Concepts of Dispensing and Patient Handling'. The training workshop was intended to be conducted over two days but due to busy schedule of drug sellers it was restricted to one day and was divided into three sessions; duration of each session was of 2.5 hours. The workshop was focused on issues including storage temperature, prescription terminologies and status of drugs. The training

workshop included presentations, video clips and group tasks.

The training was conducted in collaboration with District Health Office, Chemist and druggist association and Hamdard University, Islamabad. District Health Officer nominated Drug Inspector for coordination of training workshop. Randomly selected drug sellers were contacted through formal letter inviting for training and followed on phone for the confirmation of participation. Keeping in view the influence of opinion leaders; doctors, pharmacist from academia, drug inspectors and community pharmacies were engaged as trainers. Smooth running of workshop and attendance of drug sellers was ensured due to the group effort with DHO office. The trainees were provided with list of responsibilities of dispensers, essential documents to be kept in pharmacy, daily checklist for pharmacy, dispensing list, list of control drugs, sample of prescription, checklist for prescription and list of commonly used abbreviations and were requested to share the same with their colleagues working in pharmacies.

### Data Collection & Data Analysis

After four weeks of training a letter along with a small poster and a sample of drug label was sent to the participants of training and were reminded of the request to share the information with colleagues. Post intervention data was collected after two months of training using simulated patient visits. Neither the participants nor the data collectors and the data entry persons were aware of the

Table 2. Comparison of knowledge of dispensers working at community pharmacies between pre-post control and pre-post intervention groups						
Sub scales	Control			Intervention		
	Pre-control median (IQR)	Post-control median (IQR)	p-value	Pre-intervention Median (IQR)	Post-intervention Median (IQR)	p-value
Knowledge storage temperature range	4 (3-5)	4 (3-5)	0.259	4 (3-5)	3 (3-3.5)	0.001
Knowledge prescription terminologies	11.5 (9-14)	12 (9.75-14)	0.124	11 (9-14)	9 (8-10)	0.000
Knowledge status of drugs	16 (15-18)	16 (15-18)	0.128	16 (14.5-18)	14 (12-15)	0.000
Composite	31 (29-35)	31 (29-35)	0.062	31 (28-35)	25 (24-29)	0.000

intervention and control groups. Same data collection tools were utilized to collect post-intervention data as were used in pre-data collection. The data was cleaned coded and entered in SPSS 16 version. Wilcoxon and Mann-Whitney tests were used to compare the pre and post data.

## RESULTS

In 23.3% of the cases dispensers knew regarding which medicines to be kept in fridge. Knowledge of dispensers regarding the terms, OTC increased from 6.7% to 60% and POM increased from 0% to 43.3% after the training. Before training in 56.7%, 33.3%, 6.7%, 36.7% and 3.3% of the cases dispensers were aware regarding prescription terminologies b.i.d (twice a week), h.s (at night), q.d (four times a day), s.o.s (when needed) and p.r.n (as required). While after the training in 96.7%, 80%, 40%, 93.3% and 43.3% of the cases dispensers knew about b.i.d, h.s, q.d, sos and p.r.n, respectively. (Table 1).

Knowledge of dispensers regarding storage of drugs, prescription terminologies and status of drugs was improved after the training. While knowledge of dispensers in pre-post control groups regarding storage of drugs, prescription terminologies and status of drugs was not improved after the training (Table 2).

Dispensers who received training had comparatively better knowledge regarding storage of drugs, prescription terminologies and storage of drugs (Table 3).

## DISCUSSION

Inadequate knowledge of dispensers at community pharmacies in Pakistan has been reported.<sup>8,17,18</sup> The inadequacy in scientific knowledge among dispensers contributes to the prevailing low quality services at community pharmacies. Studies have highlighted gaps in the knowledge of dispensers in

Pakistan, but not much has been done for its improvement.<sup>8,17</sup> The results of present study showed overall improvement in the knowledge of dispensers regarding storage of drugs, prescription terminologies and status of drugs at community pharmacies after the training. Similar impact of educational intervention has been reported in knowledge of dispensers who were subjected to training.<sup>11,16,19,20</sup> Interventions can improve the knowledge and practices of dispensers working at community pharmacies. The results of the present intervention study are quite encouraging despite the overall unsatisfactory condition of dispensing practices at community pharmacies in the country.

The results of the study have shown that the knowledge and practices of dispensers can be improved through carefully designed interventions based on the contemporary needs. The implementation of intervention with the involvement of stakeholders can help in achieving better results. Similar improvements in knowledge and practices of dispensers have been reported by various studies.<sup>13-15,21-24</sup>

## CONCLUSIONS

The study has highlighted that improvements in knowledge of dispensers working at community pharmacies are possible through suitable interventions. But, results of interventions can only be sustainable through continuous monitoring and reinforcement of the training. Pharmacists shall be encouraged to come into the community pharmacy business with introduction of incentives by the government. On job training to dispensers and specifying their minimum education to work must be mandatory for the improvement of dispensing practices. There should be a mechanism for the provision of independent and unbiased information for the dispensers thus reducing the influence of commercially available information sources on their knowledge and practice. The collaborative efforts of all the stakeholders must be in line for the strict

Table 3 Comparison of knowledge of dispensers working at community pharmacies between post-control and post-intervention groups				
Variable	Indicators			
	n	Median	U	p-value
Knowledge about storage condition	Control = 30 Intervention = 30	Control = 4 Intervention = 3	233.500	0.000
Knowledge regarding prescription terminologies	Control = 30 Intervention = 30	Control = 13.5 Intervention = 8	62.500	0.000
Knowledge on status of drugs	Control = 30 Intervention = 30	Control = 16 Intervention = 13	149	0.000
Composite	Control = 30 Intervention = 30	Control = 34.5 Intervention = 25	47	0.000

Mann-Whitney test p ≤ 0.05

implementation of laws, presence of qualified person and training of currently available personnel.

#### CONFLICT OF INTEREST

None declared.

### References

1. Chalker J, Chuc NT, Falkenberg T, Do NT, Tomson G. STD management by private pharmacies in Hanoi: practice and knowledge of drug sellers. *Sex Transm Infect*. 2000;76(4):299-302.
2. Chuc NT, Larsson M, Falkenberg T, Do NT, Binh NT, Tomson GB. Management of childhood acute respiratory infections at private pharmacies in Vietnam. *Ann Pharmacother*. 2001;35(10):1283-1288.
3. Laing R, Hogerzeil H, Ross-Degnan D. Ten recommendations to improve use of medicines in developing countries. *Health Policy Plan*. 2001;16(1):13-20.
4. Dieleman M, Gerretsen B, van der Wilt GJ. Human resource management interventions to improve health workers' performance in low and middle income countries: a realist review. *Health Res Policy Syst*. 2009;7:7. doi: 10.1186/1478-4505-7-7
5. World Health Organization, How to develop and implement a national drug policy. Geneve: WHO, 1988.
6. Rajeswari R, Balasubramanian R, Bose MS, Sekar L, Rahman F. Private pharmacies in tuberculosis control--a neglected link. *Int J Tuberc Lung Dis*. 2002;6(2):171-173.
7. Oun S, Edward-Raj A, Ojuola O, Bowman G, Long WM. Assessing the quality of health services provided by informal drug sellers in rural Cambodia. in American Public Health Association 133rd Annual Meeting & Exposition. 2005. Philadelphia. Available at: [https://apha.confex.com/apha/133am/techprogram/paper\\_111013.htm](https://apha.confex.com/apha/133am/techprogram/paper_111013.htm) (Accessed June 28, 2012).
8. Hussain A, Ibrahim MIM. Qualification, knowledge and experience of dispensers working at community pharmacies in Pakistan. *Pharm Pract (Granada)*. 2011;9(2):93-100.
9. Marsh VM, Mutemi WM, Muturi J, Haaland A, Watkins WM, Otieno G, Marsh K. Changing home treatment of childhood fevers by training shop keepers in rural Kenya. *Trop Med Int Health*. 1999;4(5):383-389.
10. Smith F. The quality of private pharmacy services in low and middle-income countries: a systematic review. *Pharm World Sci*. 2009;31(3):351-361. doi: 10.1007/s11096-009-9294-z
11. Ameyaw MM, Ofori-Adjei D. The impact of three forms of educational interventions on dispensing practices. in International conferences on improving use of medicine. International Conferences on Improving Use of Medicines, Chang Mai, 1997. Available at: [http://www.icium.org/icium1997/posters/2b1\\_txt1.html](http://www.icium.org/icium1997/posters/2b1_txt1.html) (Accessed June 28, 2012).
12. Chuc NT, Larsson M, Do NT, Diwan VK, Tomson GB, Falkenberg T. Improving private pharmacy practice: a multi-intervention experiment in Hanoi, Vietnam. *J Clin Epidemiol*. 2002;55(11):1148-1155.
13. Ross-Degnan D, Soumerai SB, Goel PK, Bates J, Makhulu J, Dondi N, Sutoto, Adi D, Ferraz-Tabor L, Hogan R. The impact of face-to-face educational outreach on diarrhoea treatment in pharmacies. *Health Policy Plan*. 1996;11(3):308-318.
14. Wachter DA, Joshi MP, Rimal B. Antibiotic dispensing by drug retailers in Kathmandu, Nepal. *Trop Med Int Health*. 1999;4(11):782-788.
15. Greer G. Community Based Training of Informal Drug Sellers to Improve Malaria Case Management in Children Under Five Years in Nigeria. SEAM. Dar es Salaam, 2003.
16. Bexell A, Lwando E, von Hofsten B, Tembo S, Eriksson B, Diwan VK. Improving drug use through continuing education: a randomized controlled trial in Zambia. *J Clin Epidemiol*. 1996;49(3):355-357.
17. Rabbani F, Cheema FH, Talati N, Siddiqui S, Syed S, Bashir S, Zuberi LZ, Shamim A, Mumtaz Q. Behind the counter: pharmacies and dispensing patterns of pharmacy attendants in Karachi. *J Pak Med Assoc*. 2001;51(4):149-153.
18. Butt ZA, Gilani AH, Nanan D, Sheikh AL, White F. Quality of pharmacies in Pakistan: a cross-sectional survey. *Int J Qual Health Care*. 2005;17(4):307-313.
19. Brieger W, A. Unwin A, Greer G, Meek S. Interventions to improve the role of medicine sellers in malaria case management for children in Africa. The Sub-group for Communication and Training, The Malaria Case Management Working Group, Roll Back Malaria: 2004, Accra, Ghana.
20. Summers RS, Kruger CH. Impact of training in drug supply management (DSM) on DSM, dispensing practice and patient knowledge and care at primary health care clinics. Second International Conference on Improving Use of Medicines.2004. Chiang Mai, Thailand. Available at: <http://archives.who.int/icium/icium2004/resources/ppt/AC078.ppt> (Accessed June 28, 2012).
21. Nsimba SE. Assessing the impact of educational intervention for improving management of malaria and other childhood illnesses in Kibaha District-Tanzania. *East Afr J Public Health*. 2007;4(1):5-11.
22. Chalker J, Chuc NT, Falkenberg T, Tomson G. Private pharmacies in Hanoi, Vietnam: a randomized trial of a 2-year multi-component intervention on knowledge and stated practice regarding ARI, STD and antibiotic/steroid requests. *Trop Med Int Health*. 2002;7(9):803-810.
23. Sia IC, Galang RM, Mendoza OM, Reyes JA, Bernardo AM, Estrada DT, Quiroga CO, Santiago AC. The effect of two educational activities on the practices of drugstore sellers in the Philippines. Second International Conference on Improving Use of Medicines.2004. Chiang Mai, Thailand. Available at: <http://archives.who.int/icium/icium2004/resources/ppt/AM047.ppt> (Accessed June 28, 2012).
24. Qidwai W, Krishanani MK, Hashmi S, Afridi M, Ali RA. Private drug sellers' education in improving prescribing practices. *J Coll Physicians Surg Pak*. 2006;16(12):743-746.