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Analysis of Various Parameters and Impact of Pharmacist Intervention at Retail Medical Stores or Pharmacies of Sindh, Pakistan

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Abstract: A cross-sectional, interventional study was conducted on 1000 retail medical stores/pharmacies selected conveniently from seven divisions of Sindh. A well-designed questionnaire was developed for the collection of data, and SPSS Version 25 was used to analyze the data. All the participants were males, and majority of them were in the age group of 26-35 years (379 - 37.9%) followed by the age group of 18-25 years (260 - 26.0%), 36-45 years (248 - 24.8%), and > 45 years (113 - 11.3%). The majority of the participants were owners (647 - 64.7%). Knowledge of the participants before and after education was for generic drugs (718 - 71.8% vs. 794 - 85.3%), proper storage temperature of vaccine/insulin (458 - 45.8% vs. 572 - 61.4%), and counseling of patients for dose (236 - 23.6% vs. 379 - 40.7%). The unavailability of qualified pharmacists is also one of the major problems that results in the failure of the provision of pharmaceutical care to patients.

Keywords: intervention, retail pharmacy, pharmacist, awareness, Pakistan.

巴基斯坦信德省零售医疗商店或药房药剂师干预的各种参数和影响分析

摘要：对从信德省的七个部门中方便地选择的1000家零售医疗商店/药店进行了一项横断面干预研究。为收集数据开发了精心设计的调查问卷，并使用SPSS版本25对数据进行了分析。所有参与者均为男性，其中大多数在26-35岁年龄组(379 - 37.9%)，其次是18-25岁年龄组(260 - 26.0%)，36-45岁年龄组(248 - 24.8%)，以及> 45岁(113 - 11.3%)。大多数参与者是业主(647 - 64.7%)。教育前后参与者的知识包括仿制药 (718 - 71.8%对794 - 85.3%)、疫苗/胰岛素的适当储存温度 (458 - 45.8%对572 - 61.4%) 以及为患者提供咨询剂量 (236 - 23.6%对379 - 40.7%)。缺乏合格的药剂师也是导致未能向患者提供药学服务的主要问题之一。

关键词：干预，零售药房，药剂师，意识，巴基斯坦。

1. Introduction

The World Health Organization (WHO) described the definition of health as the condition of complete physical, psychological, and social well-being and not only the absence of disease or ailment. In reference to the definition, health-care givers play a crucial role in struggling for good health in people. According to the modern health-care delivery, Doctors, pharmacists, and nursing staff required to manage and achieving this goal. Albeit the profession of pharmacy is considered important as health-care supplier in various states, most of the developing states are under evaluation [1]. Generally, the basic duties of the pharmacist comprise, providing medicines/drugs information, drugs handling operations, manufacturing and dispensing of medications, guidance and counseling of patients, and maintaining formularies and designing health-care strategies for patients. Knowledge regarding dispensing medicines and drugs play a crucial role in patients' standard of life; therefore, the majority of the studies have been conducted in the developed states and only few in developing states, including Pakistan [2]. In developing states, including Pakistan, 50% of people are uneducated, and almost 68% dwelled in the rural regions. The lack of education and information regarding drugs is a powerful tool for determining patients' awareness regarding the prescribed medicines. In the circumstances of Pakistan, doctors basically diagnose, prescribe, and supply medication based on the symptoms of the sufferer. Moreover, physicians sometimes explain the patients regarding the proper usage of the medication because of lots of work and patients, physicians do not provide adequate consultation time to the patients [3]. Pharmacists basically, work as hospital pharmacists in public health sector hospitals. In Pakistan, the major functions of pharmacists, including storage and distribution of medicines and drugs, are on the minimal side. The nurse is entirely performing the duty for the administration of medications and supplies the information regarding the medicines to sufferers. Most of the medicines or drugs are present in the medical stores and pharmacies dispensed (hand out) by a person who had insufficient knowledge regarding the pharmacy education and lack the scope of medicines-related information that a pharmacist has done the job perfectly. This qualitative research reports a poor patient's information regarding prescription drugs [4].

This research is to inform policy makers and the commencement of new policies that improve the health-care channels and beneficial to eliminate disease load in developing states such as Pakistan.

2. Materials and Methods

2.1. Setting

This was a survey-based research conducted on different pharmacies/medical stores located in different divisions of Sindh, Pakistan. According to 2017 census, the population of Pakistan was 207.68 million with an annual growth rate of 2.40, out of which 47.85 million peoples were living in Sindh [5]. According to GlaxoSmithKline (GSK) Pharmacy Universe 2020, the number of retail medical stores/community pharmacies in Pakistan is 70785, out of which 17200 retail medical stores/community pharmacies are in Sindh [6]. For this survey-based research, seven divisions of Sindh were selected with different populations and different numbers of retail medical stores/community pharmacies.

2.2. Study Design

This was a cross-sectional, interventional survey-based study conducted on retail medical stores/pharmacies in Sindh.

2.3. Study Participants

Pharmacists/dispensers present in retail medical stores/pharmacies of Sindh at the time of visit of a pharmacist.

2.4. Sample Size

The sample size of this survey-based study was calculated using the proportion of a previous Pakistani study by Shah and colleagues, who evaluated 1003 drug stores and reported the 4.1% compliance with standards [7].

In the first step, the margin of error was calculated using the results of Shah and colleagues with the help of an online good calculator [8].

In the second step, the sample size was calculated using the reported prevalence 4.1% of Shah and colleagues along with a calculated margin of error ± 1.227 and total number of retail medical stores (11024) in selected divisions of Sindh with the help of online open EPI software [9].

In the third step, the final sample size was calculated by adding 10% drop out in a calculated sample size of 920. The final sample size is 1000.

2.5. Sampling Method

The sampling technique of this survey-based study was a convenient sampling technique, and dispensers or pharmacists present in retail medical stores/pharmacies of Sindh during the visit of a pharmacist were selected in the study.

2.6. Research Duration

The research duration of this survey-based study was twelve months, starting from 01-01-2021 to 31-12-2021.

2.7. Inclusion Criteria

- Dispensers, pharmacists, or any person present in the retail medical store/pharmacy, of any gender and age;
- Dispensers, pharmacists, or any person present in the retail medical store/pharmacy;
- Retail medical stores/pharmacies of Sindh at the time of the visit;
- Dispensers or pharmacists who were willing to be part of the study and gave their written consent.

2.8. Exclusion Criteria

- Drug wholesalers;
- The chain of medical stores;
- Pharmacies/medical stores situated in government/private hospitals/medical centers;
- Dispensers or pharmacists who were unwilling to be part of the study and refused written consent.

2.9. Data Collection Tool

A well-designed questionnaire was developed for the collection of the data from different retail medical stores/pharmacies.

2.10. Data Collection Procedure

In the first step, research approval was obtained from the University of Sindh Board of Advanced Studies & Research committee (Letter No: DRGS: 0000). After that, written consent was obtained from dispensers or pharmacists present in retail medical stores/pharmacies of Sindh at the time of visit of the pharmacist.

For data collection from retail medical stores/pharmacies, seven divisions of Sindh were selected. The researcher hired five pharmacists' team in each division, making a total of 35 pharmacists. Each division had one team leader, and four were their assistants. Each assistant reported to the team leader, and the team leader reported to the main researcher. At the time of visit of the pharmacist at a retail medical store/pharmacy, the pharmacist interviews the dispenser or pharmacist according to a predesigned questionnaire. After that pharmacist used different ways of communication (such as verbal communication and provision of brochures and videos) to provide detailed information and education about the rules and regulations of the Sindh Pharmacy Act. Each retail medical store/pharmacy was re-visited, two months after the first visit, and the pharmacist or dispenser was re-interviewed to compare the effects of

education provided by the pharmacist.

2.11. Data Analysis Procedure

Statistical Package for the Social Sciences (SPSS) Version 25, Microsoft Word 365, and Microsoft Excel 365 were collectively used for interpretation of collected data.

3. Results

As this was a survey-based research, 1000 different pharmacies/retail medical stores located in seven divisions of Sindh, Pakistan, were selected. Majority of the retail medical stores were selected from Karachi division (230 - 23.0%) followed by Larkana division (185 - 18.5%), Sukkur division (177 - 17.7%), Hyderabad division (171 - 17.1%), Mirpur Khas division (102 - 10.2%), Shaheed Benazirabad division (90 - 9.0%), and Banbhore division (45 - 4.5%) (Fig. 1).

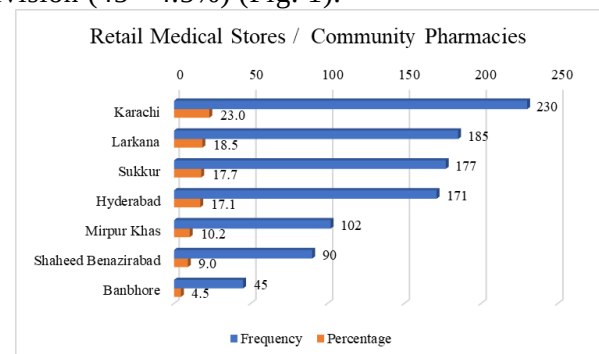


Fig. 2 Selection of retail medical stores/pharmacies from seven divisions of Sindh

All the participants present in the various pharmacies/retail medical stores of the seven divisions of Sindh were male and none were female (Table 1).

Table 1 Gender of the participants

Gender	Frequency	Percentage
Male	1000	100.0
Female	0	0.0
Total	1000	100.0

In the majority of the pharmacies/retail medical stores, no any additional service was provided (896 - 89.6%), whereas blood pressure monitoring was present at (56 - 5.6%) pharmacies/retail medical stores followed by blood sugar monitoring (44 - 4.4%), nebulization (2 - 0.2%), and vaccination (2 - 0.2%) (Table 2).

Table 2 Additional services offered at pharmacies/retail medical stores

Additional Services	Frequency	Percentage
Blood Sugar Monitoring	44	4.4
Blood Pressure Monitoring	56	5.6
Nebulization	2	0.2
Vaccination	2	0.2
None	896	89.6
Total	1000	100.0

Before education, knowledge of participants about generic drugs was reported in 718 (71.8%) participants, whereas after the education provided by the pharmacist, knowledge of participants about generic drugs was significantly ($p\text{-value}=\leq 0.001$) increased and reported in 794 (85.3%) participants (Tables 3 and 4).

Table 3 Generic knowledge of the participants before and after education

Generic Knowledge	Before Education		After Education	
	Frequency	Percentage	Frequency	Percentage
Yes	718	71.8	794	85.3
No	282	28.2	137	14.7
Total	1000	100.0	931	100.0

Table 4 Statistical analysis of generic knowledge of the participants before and after education

Chi-Square Tests					
	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	51.599 ^a	1	.000		
Continuity Correction ^b	50.809	1	.000		
Likelihood Ratio	52.587	1	.000		
Fisher's Exact Test				.000	.000
Linear-by-Linear Association	51.573	1	.000		
N of Valid Cases	1931				

a. 0 cells (0.0%) have an expected count less than 5. The minimum expected count is 202.01.
b. Computed only for a 2 x 2 table

Before education, dispensing of antibiotics without prescription was reported in 680 (68.0%) pharmacies, whereas after the education provided by the pharmacist, dispensing of antibiotics without

prescription was significantly ($p\text{-value}=0.005$) decreased and reported in 576 (61.9%) pharmacies (Tables 5 and 6).

Table 5 Dispensing of antibiotics without prescription before and after education

Antibiotic Dispensing without Prescription	Before Education		After Education	
	Frequency	Percentage	Frequency	Percentage
Yes	680	68.0	576	61.9
No	320	32.0	355	38.1
Total	1000	100.0	931	100.0

Table 6 Statistical analysis of dispensing of antibiotics without prescription before and after education

Chi-Square Tests					
	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	7.971 ^a	1	.005		
Continuity Correction ^b	7.704	1	.006		
Likelihood Ratio	7.971	1	.005		
Fisher's Exact Test				.005	.003
Linear-by-Linear Association	7.967	1	.005		
N of Valid Cases	1931				

a. 0 cells (0.0%) have an expected count less than 5. The minimum expected count is 325.44.
b. Computed only for a 2 x 2 table

Before education, air conditioner was present in 178 (17.8%) pharmacies, whereas after the education provided by the pharmacist, air

conditioner presence was significantly ($p\text{-value}=0.006$) increased and reported in 213 (22.9%) pharmacies (Tables 7 and 8).

Table 7 Air conditioner installed in medical stores before and after education

Air Conditioner Installed	Before Education		After Education	
	Frequency	Percentage	Frequency	Percentage
Yes	178	17.8	213	22.9
No	822	82.2	718	77.1
Total	1000	100.0	931	100.0

Table 8 Statistical analysis of air conditioner installed in medical stores before and after education

Chi-Square Tests					
	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	7.701 ^a	1	.006		
Continuity Correction ^b	7.389	1	.007		
Likelihood Ratio	7.700	1	.006		

Continuation of Table 8

Fisher's Exact Test				.006	.003
Linear-by-Linear Association	7.697	1	.006		
N of Valid Cases	1931				

a. 0 cells (0.0%) have an expected count less than 5. The minimum expected count is 188.51.

b. Computed only for a 2x2 table

4. Discussion

In developing countries, such as Pakistan, the quality of retail medical stores or pharmacies is very low, and they fail to maintain the quality of medicines and provide quality of care, resulting in poor supply of quality of drugs and poor health care. There are various legitimate causes of these problems faced by retail medical stores or pharmacies such as poverty, lack of education, lack of professionally trained human resources, unavailability of strict rules and regulations, and most importantly, failure of authorities to enforce the law [10-13].

In the current research, current knowledge of the participants before and after education was evaluated using different parameters, including knowledge of participants about generic drugs (718 - 71.8% vs. 794 - 85.3%).

One of the major drawbacks of private retail medical stores in developing countries such as Pakistan is the easy availability of antibiotics without prescriptions. In current research, approximately 680 (68.0%) retail medical stores or pharmacies were involved in dispensing of antibiotics without prescription and 829 (82.9%) were dispensing incomplete doses of antibiotics. Unfortunately, this practice remains common after the provision of education, but a significant difference and reduction was observed in dispensing antibiotics without prescriptions (576 - 61.9%) and dispensing incomplete doses of antibiotics (725 - 77.9%). A Pakistani study by Siddiqui, et al. also reported the 16.7% of antibiotics dispensed without prescription [14]. Other studies also reported the antibiotic dispensing without prescription such as Saleem et al. [11] (96.9%) and Majid Aziz et al. [15] (81.5%). All similar studies reported that dispensing of antibiotics without prescription is very common in Pakistan, which results in the development of antibiotic resistance and decrease in the efficacy of antibiotics.

In current research, the rules and regulation required for retail medical stores or pharmacies were also investigated before and after the provision of education, including the refrigerator/fridge working (328 - 32.8% vs. 385 - 41.4%).

5. Conclusion

Most of the participants have good knowledge about generic drugs, alternate dispensing of drugs,

product recalls, and sound-alike and look-alike drugs, and their knowledge was further improved after the provision of education. Majority of the retail medical stores/pharmacies were involved in dispensing of antibiotics without prescription and dispensing incomplete doses of antibiotics, and even this practice remains common after the provision of education. Majority of the medical stores were working without qualified pharmacists, air conditioning facility, biological and drug-specific refrigerators, temperature monitoring devices, and with direct exposure to sunlight. These are the common practices throughout Pakistan, resulting in poor quality of medicines and healthcare provided to patients. Professionally trained pharmacists or dispensers should be present in retail medical stores/pharmacies.

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