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Current status of pharmacies and qualifications of pharmacists in community pharmacies of India

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Current Status of Pharmacies and Qualifications of Pharmacists in
Community Pharmacies of India

by

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Thesis

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in

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Abstract

India is a developing nation and has progressive health care facilities. An important part of its health care system is the community pharmacy, where registered pharmacists provide pharmaceutical services to the public. Community pharmacy is the first place the public looks for drug-related information and medication counseling. The main objective of this study was to investigate the current status of pharmacies and the impact of the Pharm D program (professional pharmacy doctoral program) on the qualifications of pharmacists in India. This research specifically addressed the fate of community pharmacies after the implementation of this program. This research was conducted in the form of a cross-sectional survey in the Guntur district, Andhra Pradesh state, India. The sample included representative pharmacies in the district covering urban and rural areas. Earlier, the majority of pharmacies had non-pharmacists dispensing or counseling patients. Though Pharm D graduates were found to be dispensing medications in pharmacies, there was only minimal progress. It is recommended that the Government of India should make the Pharm D mandatory for a dispensing pharmacist to improve patient care.

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Introduction

Pharmacy is the science or practice of preparing and dispensing medical drugs. Notably, pharmacy as a profession is rather a modern invention. Earlier traditional healers would diagnose, treat, and dispense medications, but later apothecaries were established in the 12th century, which solely dispensed various types of medicines. The first pharmacy colleges to provide formal pharmacy training appeared only in the eighteenth Century in Paris and they paved the way for specialized pharmacy education (Desale, 2013).

In India, pharmacy education in its current form was initiated in 1932 at Banaras Hindu University. The Pharmacy Act was passed in 1948 and the Pharmacy Council of India (PCI) was established in 1949. With the strong recommendations of various Drugs Enquiry Committees to control the practice of pharmacy, the Government of India introduced various training programs for registration as a pharmacist and to procure a license (Singh & Chopra, 2008). Several degree courses were therefore introduced which included a Diploma in Pharmacy (D. Pharm), Bachelor of Pharmacy (B. Pharm), Master of Pharmacy (M. Pharm), Doctor of Pharmacy (Pharm D), and a Doctor of Philosophy in pharmacy (Ph.D.); (Desale, 2013). After completing a pharmacy degree, an individual could procure a license to establish a pharmacy outlet to practice pharmacy.

Community pharmacy is a type of pharmacy practice or health care system which emphasizes providing medical services in a particular community. Community pharmacists are responsible for dispensing and counseling according to patients medicine-related needs and providing basic access to health care. The prime source of medicines for both hospitalized and ambulatory patients is either the retail or community pharmacies. Unlike the earlier days, the medicines that are available in community pharmacy are manufactured by the pharmaceutical industry and are available through distributors or agents (Mossialos et al., 2015). Community

pharmacies are often the first and the only available source of inexpensive health care in India (Kamat & Nichter, 1998; Goel, Ross-Degnan, Berman & Soumerai, 1996).

The eligibility requirements to practice as a clinical pharmacist vary by different countries. Table 1 provides a brief description of the requirements for registration as a pharmacist in India and the US.

Table 1

Requirements for Registration as a Pharmacist in India and USA

Country	Academic Qualification	Duration of Course + Internship/Residency	Regulatory Authority	Additional Requirements to Practice Pharmacy
India	Diploma in Pharmacy Bachelor of Pharmacy Pharm D	2 Years 3 months 4 Years 3 months 6 Year	Pharmacy Council of India	N/A
USA	Pharm D	4+ 2 Year	National Association of Boards of Pharmacy or State Boards of Pharmacy	NAPLEX (North American Pharmacist Licensure Examination) + MPJE (Multistate Pharmacy Jurisprudence Examination)

Source: Revikumar and Veena (2014).

However, in India, the community pharmacist is restricted to only supplying medicines. Patient-oriented services are not in complete effect and only a few community pharmacists offer them. The rising need for a community pharmacy system demanded a dedicated community pharmacy professional, which led to the introduction of Doctor of Pharmacy (Pharm D) course, which is a professional doctoral degree in pharmacy (Desale, 2013). Though the course was started in the University of Southern California in 1950 as a six-year program, it has spread

across the world (Sonnedecker, 1976). The duration of the program varies from country to country. The Pharm D program aims to train individuals to improve the quality of medication use and enhance the safety of drug administration. Ward rounds, clinical postings, and residency are the core components of the Pharm D program. These all help the students to become accustomed to the hospital environment and give an introduction to evidence-based therapy. The Pharm D students have the opportunity of maintaining close relationships with health care providers such as physicians and nutritionists and apply this knowledge in maintaining patient health (Revikumar & Veena, 2014).

Pharmacy Practice in India

India has over a million registered clinical pharmacists of which currently 55% are in community pharmacies, 20% in the hospital sector, 10% in industrial drug development, 2% in academics, and the remaining in retail pharmacies (Ahmad & Patel, 2013). In 1937, the four-year Bachelor of Pharmacy course was introduced in India that provided only industry-oriented training, and clinical pharmacy practice was not discussed in detail. Most of the curriculum concentrated on organic, inorganic, medicinal, and analytical chemistry. The rest of the curriculum concentrated on drug manufacturing, development, and mechanism of action (Basak & Sathyanarayana, 2010). A two-year diploma (D. Pharm) in the pharmaceutical sciences with three months of practical training is the minimum requirement for awarding a license in pharmacy. The current course curriculum for the D. Pharm at present was developed in 1991. Health care policies, patient counseling methodologies, patient care, and engagement are not covered in the curriculum (Basak & Sathyanarayana, 2010). Currently in India, these diploma-trained pharmacists constitute the majority of the pharmacist workforce. Both of these programs have a curriculum designed so that it is industry-oriented with an overemphasis on basic general

sciences and less coursework related to patient care and safe dispensing procedures. The majority of the graduates of these programs choose to seek positions in the pharmaceutical industry or drug regulatory agencies rather than practicing as a community pharmacist. These deficiencies of the above-mentioned degrees are significantly improved with the introduction of Pharm D (Basak & Sathyanarayana, 2010).

The Pharmacy Council of India (PCI) is the regulatory body responsible for managing pharmacy profession and education. The PCI is constantly working hard to improve the standards of the pharmacy curriculum in order to produce highly competitive and talented professionals (Desale, 2013).

Pharm D Degree and Its Impact in Pharmacy

The government of India along with the Pharmacy Council of India introduced the Doctor of Pharmacy (Pharm D) in 2008 (Garipelly, Garg, & Maleti, 2012). Currently, there are approximately 47 institutions offering Pharm D degrees in India and more colleges are yet to be approved (Basak & Sathyanarayana, 2010). This degree was mainly aimed at providing better clinical services in the Indian health care system. This six-year program has extensive classroom-based training for the first five years followed by an internship or residency for the last year. The main objective behind the establishment of the degree was to raise the standards of pharmacy practice in India in terms of drug safety, patient care, and also to make the pharmacy degree acceptable in various countries across the world. It also aimed to provide improved patient care in cooperation with prescribers and other health care professionals based on their knowledge of therapeutics and evidence-based data. The issues that are relevant to the legal, ethical, social, economic, professional, pharmaceutical, and clinical sciences that may have an impact on the therapeutic outcomes are also taken into consideration while framing the contents of Pharm D

degree. Instead of establishing new policies which are, in fact, quite similar to the curriculum already in place, the focus should be placed on evaluating the existent curriculum as well as on the creation of an adequate number of jobs for the graduates from hundreds of pharmacy schools all over India (Garipelly, Garg, & Mateti, 2012).

Additional Activities in the Pharm D Degree

Similar to the Bachelors of Pharmacy, the Pharm D degree includes the basics of drug manufacturing, pharmacology, and medicinal chemistry, but in addition, the Pharm D graduates also have an excellent opportunity to work alongside doctors, interact directly with patients, and have an additional clinical exposure similar to the curriculum that is being followed in the United States. In addition, it still has the chemistry-focused subjects covered. This also includes more interaction with patients as well as improved inter-professional collaboration between health care departments. Almost all aspects of patient care are covered in the curriculum. Pharmacists with Pharm D qualifications are specially trained in the expanded curriculum, which has included all the aspects which were not covered in previous degree courses (Mateti, Rajesh, Laddha, Sharma, & Anantha, 2011).

Pharm D professionals review the medical history of patients to help design further treatment plans. They participate in ward rounds with physicians and attend hospital meetings. They provide patient medication counseling in which they assist patients by answering drug-related queries and providing clinical information. They work together with physicians to identify and minimize the risk of adverse drug reactions. Pharm D graduates also perform community service in hospitals and work towards the enforcement of local pharmacy guidelines (Deshpande, Farooq, John, & Rao, 2012).

In a study conducted by Srikanth, Ahmad, Reddy, Balkrishnan, and Nagappa (2013) among students enrolled in the Pharm D program in different Indian pharmacy institutes, 96% of the students were of the belief that more clinical skills could be acquired with a Pharm D when compared to conventional degrees such as B. Pharm or M. Pharm. In another survey study conducted by Ahmad and Patel (2013), nearly 65% of the students believed that if medications were prescribed by Pharm D graduates along with physicians, the process of prescribing could be made safer and beneficial for patients.

Background to Research

In developing countries such as India, community pharmacies play a very important role in patient safety and wellbeing (Sabde et al., 2011). Moreover, in rural areas, community pharmacies are the first and only reliable sources of medicines in the absence of primary health care centers. Many drugs may be purchased without a doctor's prescription even for some of the major diseases at community pharmacies (WHO, 1997). Thus, pharmacists play a crucial role in patient care, especially to the poor and rural populations. Many of these patients try to avoid doctor visits and instead consult a pharmacist for medications as a way of obtaining inexpensive and affordable health care (Kamat & Nichter, 1998).

In India, many important barriers exist in providing pharmaceutical care for patients. One of the major issues is related to the deficiencies in the pharmacist's education, training, and qualifications. The other contributing factors that affect the quality of community pharmacies are the weakness in the regulatory framework and the lack of proper recognition of the post of clinical pharmacists by the other health care professionals in the society (Basak & Mil, 2009).

There is very little information describing the current status of pharmacies and the impact of the Pharm D program on the qualifications of the pharmacist in community pharmacies of India. Since the pharmacist's education and qualifications are very important in several aspects of improving health care for the benefit of the community, this research focuses on the impact of the Pharm D degree on the practice of pharmacy.

Dispensing Practices in India

A study conducted in 2010 on "evaluating medicines dispensing patterns in Tamil Nadu, Southern India" reported that in the majority of the drug stores, medications were dispensed by less-qualified or even non-qualified personnel compared to other developed countries (Basak & Sathyanarayana, 2010). Another study conducted in Kerala, India, which surveyed 53 pharmacies, found that only 10% who were involved in dispensing drugs were B. Pharm graduates (Kiron et al., 2012). Sabde et al. (2011) surveyed 475 pharmacies in Central India and reported that only ~12% of staff had professionally qualified pharmacist licenses. Kamat and Nichter (1996) conducted a study in Mumbai, India to evaluate qualifications of dispensing personnel and found that only 41% were B. Pharm graduates out of 75 pharmacies surveyed. Thus, community pharmacists were present only in relatively few pharmacies and more than half of pharmacies function without pharmacists. Rural parts are of critical importance in developing countries, especially India where 72.2% of the population resides and there is frequent shortage of primary care physicians and pharmaceutical care services. There is a need for expansion of pharmacy practice, especially in rural areas where the community pharmacy system is usually weak.

Purpose of the Research

The research investigated the current status of pharmacies and the impact of the Pharm D program on the qualifications of pharmacists in India. The research focused on the impact of the Pharm D program on the qualifications of the pharmacist by comparing community pharmacies in rural and urban areas of Southern India.

Research Questions

- a) What is the qualification of the person dispensing prescriptions in different types of community pharmacies after implementation of the Pharm D program?
- b) What proportion of dispensing pharmacists in community pharmacies hold the Pharm D in rural areas versus urban areas?

Research Design and Methodology

Target Population

The target population for this study included pharmacy owners and managers who were working in community pharmacies.

Sample Population

The sample population for this study included 493 pharmacies.

Method of Data Collection

The research survey was conducted in an online format. This online survey was shared with Guntur Medical Stores Association, a local pharmacy organization that represents all the community pharmacies in the district (Appendix A). The survey was distributed by the association to the potential participants through email, which was sent to 493 pharmacies in the district covering both rural, suburban, and urban areas. The questionnaire included ten questions (Appendix B). Information collected included qualifications of the person dispensing prescriptions or counseling patients before and after 2013, opinion and impact on business after the introduction of the Pharm D program, and location of the pharmacy. The survey questionnaire was designed using Google forms survey software. IRB approval was obtained from the Eastern Michigan University Human Subjects Review Committee (UHSRC). The approval letter can be found in Appendix C. After completing the ten survey questions, the responses were recorded when the participants completed and submitted the questionnaire. Changes in the qualifications of the person dispensing drugs before and after the introduction of the Pharm D program were explored. Associations between qualitative responses were evaluated and analyzed using Fisher's exact test and the chi-square test of independence.

Results

Analysis and Presentation of Data

The survey was sent to 493 pharmacies of which 388 (78.7%) participated and responded to the survey. Summaries of the responses are presented in Table 2.

Table 2

Survey Questionnaire Analysis

Q1	1) Prior to 2013 who dispensed prescriptions in your pharmacy?	Total responses	% response
a	Non-pharmacist	165	42.5%
b	Pharmacist with a Bachelors in Pharmacy	213	54.9%
c	Pharmacist with a Masters in Pharmacy	10	2.6%
d	Pharmacist with a Pharm D degree	0	0.0%
TOTAL		388	
Q2	2) Prior to 2013, who primarily answered the patient's questions or counseled patients?		
a	Non-pharmacist	166	42.8%
b	Pharmacist with a Bachelors in Pharmacy	212	54.6%
c	Pharmacist with a Masters in Pharmacy	10	2.6%
d	Pharmacist with a Pharm D degree	0	0.0%
TOTAL		388	
Q3	3) Currently, who dispenses prescriptions at your pharmacy?		
a	Non-pharmacist	163	42.0%
b	Pharmacist with a Bachelors in Pharmacy	189	48.7%
c	Pharmacist with a Masters in Pharmacy	10	2.6%
d	Pharmacist with a Pharm D degree	26	6.7%
TOTAL		388	
Q4	4) Currently, who answers patients' questions or counsels patients in your pharmacy?		
a	Non-pharmacist	163	42.1%
b	Pharmacist with a Bachelors in Pharmacy	188	48.6%
c	Pharmacist with a Masters in Pharmacy	10	2.6%
d	Pharmacist with a Pharm D degree	26	6.7%
TOTAL		387	

Table 2 (continued)

Q5	5) In your opinion, the introduction of the Pharm D program requirements is		
a	Good idea	343	88.6%
d	Bad idea	21	5.4%
c	I have no opinion on the matter	23	5.9%
TOTAL		387	
Q6	6) How has the Pharm D program impacted your employees?		
a	I have been required to hire new employees	31	8.1%
b	I have had to dismiss one or more employees	2	0.5%
c	I have not had to change any personnel because of the program requirements	349	91.4%
TOTAL		382	
Q7	7) Location of pharmacy		
a	Urban	341	87.9%
b	Suburban	16	4.1%
c	Rural	31	8.0%
TOTAL		388	
Q8	8) Type of pharmacy		
a	Independent pharmacy	153	39.4%
b	Wholesale	12	3.1%
c	Attached to health care facility	21	5.4%
d	Retail chain	202	52.1%
TOTAL		388	
Q9	9) Who is completing the survey		
a	Owner or store manager	280	72.2%
b	Staff pharmacist	106	27.3%
c	Other pharmacy employees	2	0.5%
TOTAL		388	

The tenth question was open ended to provide respondents an opportunity to include comments about the recent introduction of the Pharm D. The respondents who commented giving significant reasons about their opinion of the Pharm D degree were included in Appendix D only. Others just had no specific reasons supporting their opinion in the comments.

Before 2013, there were no Pharm D graduates present in community pharmacies. However, with the introduction of Pharm D after 2013, 26 (6.7%) of the responding pharmacies had Pharm D graduates dispensing medications and counseling. Cross-tabulations were done for the dispensing pharmacists with Pharm D degree and non-Pharm D degree pharmacists by location of the pharmacy and the results are presented in Table 3.

Table 3

Cross Tabulation Results by Location of Pharmacy

		Currently, who dispenses prescriptions at your pharmacy?		
		Pharmacist with non-Pharm D degree	Pharmacist with Pharm D degree	Total
Urban	Count	339	2	341
	% within Location of pharmacy	99.4%	0.6%	100.0%
Suburban + Rural	Count	23	24	47
	% within Location of pharmacy	48.9%	51.1%	100.0%
Total	Count	362	26	388
	% within Location of pharmacy	93.3%	6.7%	100.0%

Using the Fisher's exact test (Agresti, 1992), a comparison was made between the proportion of pharmacists with a Pharm D degree and non-Pharm D pharmacists in suburban and rural areas versus urban areas. In urban areas, only 0.6% of the pharmacies dispensed drugs by Pharm D graduates, while for suburban and rural areas 51.1% of the pharmacies dispensed drugs by Pharm D pharmacists. The one-tailed p value is 0.000 indicating that there is a statistically significantly higher proportion of dispensing Pharm Ds in suburban and rural areas than urban areas. Thus, a difference exists between the educational level of pharmacist and location.

Cross tabulations were done for the pharmacists with Pharm D degree and non-Pharm D degree pharmacists with respect to type of the pharmacy and the results are presented in Table 4.

Table 4

Cross Tabulation Results by Type of Pharmacy

			Currently, who dispenses prescriptions at your pharmacy?		Total
			Pharmacist with non-Pharm D degree	Pharmacist with Pharm D degree	
Type of Pharmacy	Independent Pharmacy	Count	153	0	153
		% within Type of Pharmacy	100.0%	0.0%	100.0%
	Wholesale + Attached to Health care Facility	Count	33	0	33
		% within Type of Pharmacy	100.0%	0.0%	100.0%
	Retail Chain	Count	176	26	202
		% within Type of Pharmacy	87.1%	12.9%	100.0%
Total		Count	362	26	388
		% within Type of Pharmacy	93.3%	6.7%	100.0%

The percentage of non-Pharm D pharmacists dispensing prescriptions decreased from 100% for independent pharmacies and wholesale/attached to health care facility to 87.1% for retail chain pharmacies. All of the Pharm D graduates were present only in retail chain pharmacies and none of them in either health care attached, independent, or wholesale pharmacies. The chi-square test of independence was used to find out the educational level of Pharm D and non-Pharm D pharmacists vary by type of pharmacy. A chi-square value of 25.66 was obtained with two degrees of freedom with a p value of 0.000. Thus, we can conclude that

there is a statistically significant relationship between educational level of pharmacist and type of pharmacy.

Cross tabulations were done for the person completing the survey and their opinion about the introduction of Pharm D program. The results are presented in Table 5.

Table 5

Cross Tabulation Results by the Person Completing the Survey

		In your opinion, the introduction of the Pharm D program requirements is			Total	
		Good idea	Bad idea	I have no opinion on the matter		
Who is completing the survey	Owner or store manager	Count	243	15	22	280
		% within Who is completing the survey	86.8%	5.4%	7.9%	100.0%
	Staff pharmacist or other pharmacy employee	Count	100	6	1	107
		% within Who is completing the survey	93.5%	5.6%	0.9%	100.0%
Total		Count	343	21	23	387
		% within Who is completing the survey	88.6%	5.4%	5.9%	100.0%

The table shows that 86.8% of owners or store managers versus 93.5% of staff pharmacists or other pharmacy employees think that it is a good idea to introduce the Pharm D degree. For the test of independence, a chi-square value of 6.64 was obtained with two degrees of freedom and a p value is 0.036. This indicates that the opinion about the introduction of the

Pharm D degree does significantly differ between owners or store managers and staff pharmacists or other pharmacy employees.

Cross tabulations were done for the person completing the survey with respect to the Pharm D degree's impact on hiring new employees and the results are presented in Table 6.

Table 6

Cross Tabulation Results of Pharm D Degree Impact on Hiring New Employees

			How has the Pharm D program impacted your employees?			Total
			I have been required to hire new employees	I have had to dismiss one or more employees	I have not had to change any personnel because of the program requirement	
Who is completing the survey	Owner or store manager	Count	30	2	242	274
		% within Who is completing the survey	10.9%	0.7%	88.3%	100.0%
	Staff pharmacist/ Other pharmacy employee	Count	1	0	107	108
		% within Who is completing the survey	0.9%	0.0%	99.1%	100.0%
Total		Count	31	2	349	382
		% within Who is completing the survey	8.1%	0.5%	91.4%	100.0%

The table shows that 88.3% of owners or store managers compared with 99.1% of staff pharmacists stated that there was no need to change any personnel after the introduction of Pharm D degree. For the test of independence, a chi-square value of 11.36 was obtained with two degrees of freedom and a p value is 0.003. Thus, the opinion concerning the impact of the Pharm D program on hiring new employees differs significantly according to the person completing the survey.

All the other possible cross tabulations were also tested for significance, but none of them were significant. The last question asked respondents to include comments about the introduction of the Pharm D program; 195 of the respondents gave comments to the question. Out of 195 comments, the respondents were either of the opinions that it was a good idea to introduce Pharm D or that it was a bad idea. The significant reasons for believing it is an unnecessary degree according to some respondents included fees too costly, a lengthy six-year degree program, and also not improved curriculum. One interesting comment was that the degree was just introduced to give Pharm D graduates foreign eligibility but not useful in India. Those who responded that it was a good idea commented that the degree would make an impact in rural areas but only offered in few colleges. Others just had no specific reasons supporting their opinion about the degree but only commented that it was either good or bad (Appendix D).

Discussion

The qualification of the pharmacist plays a very major role in terms of patient safety and wellbeing as they are medication experts; patient safety is at risk if the position of pharmacist is occupied by non-qualified personnel. When the qualification of the person dispensing prescriptions before and after Pharm D program was examined, it was found that the non-pharmacists remained consistent but B. Pharm pharmacists decreased in number. Of Pharm D graduates, 26 (6.7%) were first found dispensing medications after 2013 among the surveyed pharmacies. Therefore, it is understood that even though the pharmacy owners started hiring Pharm D graduates in place of B. Pharm pharmacists, non-pharmacists were not removed from the stores and instead, their number remained unchanged. The factors taken into consideration by the pharmacy managers to keep the non-pharmacist numbers constant were not evaluated by this survey. Possibly, economic costs of the non-pharmacist were exploited by the pharmacy owners. However, the M. Pharm pharmacists who were dispensing prescriptions remained constant even after the Pharm D program, and all of them were in urban areas. Thus, those particular pharmacies continued dispensing with higher qualified M. Pharm pharmacists and were apparently unaffected by the Pharm D program.

The majority of the Pharm D graduates found dispensing prescriptions in the pharmacies were present in rural areas (77.4%). This finding suggests that Pharm D graduates were more inclined to work in rural areas as there might be more opportunities for career growth in rural areas where there is always a significant shortage of primary care physicians. According to Ahmad, Patel, Khan, & Chang (2014), Pharm D graduates can serve as valuable assets in non-urban areas through safer prescribing and dispensing practices in the absence of primary care providers. But this study was conducted in only one district of the Andhra Pradesh state, and the

location of Pharm D graduates employment in other places is unknown and the results cannot be easily extrapolated to the rest of India. The majority of the 88.3% of owners or store managers along with 99.1% of staff pharmacists stated that there was no need to change any personnel after the introduction of Pharm D degree. This implies that most of them were of the opinion that their hiring practices remains unaffected even after Pharm D degree implementation.

All of the Pharm D graduates worked in retail pharmacies rather than independent or health care attached pharmacies. The survey showed that 12.2% of the retail pharmacies responded that they have been required to hire new employees. This implies that retail pharmacies may be more inclined to hire Pharm D graduates, although the reason for this hiring is unclear. There were mixed opinions in the comments section about the introduction of the Pharm D degree. Some of them were viewing the degree as a bad idea and not necessary, whereas the rest of them were of the opinion that it was a good program. From this, we can understand that there are mixed reviews and not everyone had a good opinion about the Pharm D degree.

Even though 86.8% of the pharmacy managers agreed that the Pharm D program is a good idea, whether they believe that the higher education requirement makes a better pharmacist is yet to be determined. Whether the expectations of the Pharm D program will impact the pharmacy owners' hiring practices in the future will need to be examined. If the Pharm D program was to be made a requirement in pharmacies by the Government of India, the perceptions of the owners or store managers about this requirement should also be evaluated. Whether this mandate is expected should also be investigated. The employment rates for Pharm D graduates after degree completion should also be surveyed to evaluate the impact of the program. It is uncertain whether the Pharm D hiring numbers will increase in the coming years

as this is the only beginning of the program implementation. The Government of India implemented the new Pharm D program but did not make a regulation that only Pharm D qualified graduates should dispense medications. Without such a mandate, the impact of the Pharm D degree and its presumed positive benefit for patients may take a significant period of time.

Conclusion

The qualifications of the person dispensing prescriptions after Pharm D degree implementation was tested, and it was found that there is only a minimum progress after two years. Even though Pharm D graduates were dispensing prescriptions in community pharmacies, in the region surveyed they were limited in number, but they showed a strong presence in rural areas. Furthermore, Pharm Ds are most quickly being added to rural chain store pharmacies.

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Appendix A: Letter from the Association**GMA****GUNTUR MEDICAL STORES ASSOCIATION**Kothapet Guntur Andhra Pradesh 522001

Date...12th JAN 2016**To whomsoever it may concern**

Please accept this letter as acknowledgement that Guntur Medical Stores Association has given permission to Ms. Krishnaveni Marupadi to distribute the survey to the local pharmacies in Guntur District. The survey will be distributed by email through which the survey link with questionnaire will be sent to local pharmacies in the area via the association.

Sincerely,



Raghavendra Rao Prasad Myneni
Associate Director, Medical stores Association
Guntur AP 522001

Appendix B: Sample Survey Form

- 1) Prior to 2013 who dispensed prescriptions in your pharmacy? [Check all that apply]
 - a) Non-pharmacist
 - b) Pharmacist with a Masters in Pharmacy
 - c) Pharmacist with a Pharm D degree
 - d) Pharmacist with Bachelors in Pharmacy
- 2) Prior to 2013, who primarily answered patient's questions or counseled patients? [Check all that apply]
 - a) Non-pharmacist
 - b) Pharmacist with Bachelors in Pharmacy
 - c) Pharmacist with a Masters in Pharmacy
 - d) Pharmacist with a Pharm D degree
- 3) Currently, who dispenses prescriptions in your pharmacy? [Check all that apply]
 - a) Non pharmacist
 - b) Pharmacist with Bachelors in Pharmacy
 - c) Pharmacist with a Masters in Pharmacy
 - d) Pharmacist with a Pharm D degree
- 4) Currently, who answers patients' questions or counsels patients in your pharmacy? [Check all that apply]
 - a) Non pharmacist
 - b) Pharmacist with Bachelors in Pharmacy
 - c) Pharmacist with a Masters in Pharmacy
 - d) Pharmacist with a Pharm D degree
- 5) In your opinion, the introduction of the Pharm D program requirements is a
 - a) Good idea
 - b) Bad idea
 - c) I have no opinion on the matter

- 6) How has the Pharm D program impacted your employees?
 - a) I have been required to hire new employees
 - b) I have had to dismiss one or more employees
 - c) I have not had to change any personnel because of the program requirement
- 7) Location of pharmacy
 - a) Urban
 - b) Suburban
 - c) Rural
- 8) Type of pharmacy
 - a) Independent pharmacy
 - b) Wholesale
 - c) Attached to healthcare facility
 - d) Retail chain
- 9) Who is completing the survey?
 - a) Owner or store manager
 - b) Staff pharmacist
 - c) Other pharmacy employee
- 10) Please add below any comments on the recent Pharm D requirements and its impact on your business?

Appendix C: Approval Letter from the EMU Human Subject Review Committee

RESEARCH @ EMU

UHSRC Determination: EXEMPT

DATE: March 30, 2015

TO: krishnaveni marupudi
Department of *Clinical Research Administration*
Eastern Michigan University

Re: UHSRC: # 729944-1
Category: Exempt category 2
Approval Date: March 30, 2015

Title: Current status of pharmacies and qualifications of pharmacists in community pharmacies of India

Your research project, entitled **Current status of pharmacies and qualifications of pharmacists in community pharmacies of India**, has been determined **Exempt** in accordance with federal regulation 45 CFR 46.102. UHSRC policy states that you, as the Principal Investigator, are responsible for protecting the rights and welfare of your research subjects and conducting your research as described in your protocol.

Renewals: Exempt protocols do not need to be renewed. When the project is completed, please submit the **Human Subjects Study Completion Form** (access through IRBNet on the UHSRC website).

Modifications: You may make minor changes (e.g., study staff changes, sample size changes, contact information changes, etc.) without submitting for review. However, if you plan to make changes that alter study design or any study instruments, you must submit a **Human Subjects Approval Request Form** and obtain approval prior to implementation. The form is available through IRBNet on the UHSRC website.

Problems: All major deviations from the reviewed protocol, unanticipated problems, adverse events, subject complaints, or other problems that may increase the risk to human subjects **or** change the category of review must be reported to the UHSRC via an **Event Report** form, available through IRBNet on the UHSRC website

Follow-up: If your Exempt project is not completed and closed after **three years**, the UHSRC office will contact you regarding the status of the project.

Please use the UHSRC number listed above on any forms submitted that relate to this project, or on any correspondence with the UHSRC office.

Good luck in your research. If we can be of further assistance, please contact us at 734-487-3090 or via e-mail at human.subjects@emich.edu. Thank you for your cooperation.

Sincerely,

Jayne Yatzak
Chair
College of Health and Human Services Human Subjects Review Committee

Appendix D: Comments from the Survey

- Pharm D degree not necessary. Higher costs for hiring Pharm D graduates.
- Good idea that government introduced this degree.
- Pharm D program bad idea. Already same work done by other persons.
- P should be made mandatory.
- Can change dispensing methods.
- Not a good degree program. Should pay more for Pharm D pharmacists.
- Good program but lot of time to see more Pharm D in market.
- Not a very good program.
- B. Pharmacy should be replaced by Pharm D overall.
- The government should not have introduced the degree.
- Very good program.
- Should be made as 4 year program instead of total 6 years. Lengthy 6 year program.
- Good for impact in rural areas.
- Program curriculum should be improved more.
- Fees too costly for Pharm D
- More colleges should start this degree.
- Bad idea because Non pharmacists lose jobs if degree made a rule for dispensing.
- Very good program but only few colleges.
- Bad idea and not worth program, fees are high.
- Low standards, not improved curriculum.
- Gives many Pharm D graduates eligible for foreign eligibility of registered pharmacist not useful in India.