Health-promoting services provided in pharmacies: A systematic review

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Abstract:
Pharmacies are a major component of health systems and a major part of health service provision. This study aimed at identifying and introducing the potentials of pharmacies in health promotion. This was a systematic review that searched PubMed, Web of Science, Science Direct, SID, Magiran, and IranMedex from February 1990 to September 2018 for related materials. The main search keywords were (pharmacy services), (community pharmacy services), (retail pharmacy services), (pharmacy practice intervention). Inclusion was limited to those papers that discussed the health-promoting services provided in the pharmacies. The quality of included papers was assessed by the Critical Appraisal Skills Program checklists. The Preferred Reporting Items for Systematic Reviews and Meta-Analyses chart was followed in all stages of the study. Of the 4156 papers retrieved, 18 met the inclusion criteria and included in the analysis. Study findings were categorized into three main categories: Health and prevention services, services related to treatments, and the awareness about the pharmacies’ functions. The health and prevention category consisted of education, vaccination, screening and prevention of diseases, family planning, blood pressure monitoring, quitting smoking, limiting alcohol, and weight management. The treatment-related services consisted of adherence to medication, medication consultation, minor pains, and emergency medical services. Pharmacies can provide a wide variety of services besides the medications. Purposeful development of the services provided in the pharmacies and involving them in an extended array of services may accelerate the health promotion activities of the health system and result in improved quality of life and decreased costs. To do so, the legal, educational-skill, and pricing challenges should be resolved.

Keywords:
Community pharmacy services, health promotion, pharmacies

Introduction
Pharmacies are a major component of the health systems of the countries and a major place to provide health services.[1] They are an integral part of primary health care and in many cases, the first place that the health system faces the clients.[2] The World Health Organization believes that the pharmacies are easily accessible for the people and thus can have a key role in health service provision.[3]

The role of the pharmacies has changed in the past two decades and they are no longer just a place for dispensing the medications of the patients. But they had become a center for providing comprehensive care. The role of the pharmacists also has changed from producing and dispensing the medicines to service provision, caregiving, health promotion, education, prevention, and assuring safe use of the medications.[4,5]

Pharmacies in Africa provide primary health care, screening tests, and emergency...
services.\[1\] It is estimated that annually 40,000–50,000 adults in the USA die due to diseases that are preventable by vaccines. Whilst the pharmacies can have a major role in reducing these preventable deaths by educational and vaccination services.\[6\] As another example, considering the increasing prevalence of high blood pressure in Japan, pharmacies can provide education and change the lifestyle of the population to decrease the disease and its consequences.\[7,8\]

Since the pharmacies are in the frontline of the health system and thus in contact with the population, they have an undeniable role in population health. So, their efforts in health promotion activities can lead to increased health levels of the population and reduced costs of the health system.\[9,10\] Pharmacies all around the world provide various services to help health promotion of the population while these services are not provided at an optimum level in all places. This is in spite of their capacities, the remarkable access to these facilities, and the fact that they can highly contribute in health promotion programs. This study aimed at the identification of health-promoting services that can be provided in pharmacies. So, seeing the pharmacies not just as a place for prescription and distribution of the medicines but also a place for the provision of additional services may promote the health of the population and in return, reduce the health-care costs.

**Materials and Methods**

**Search strategy and database search**

This was a systematic review to identify the health-promoting services of the pharmacies. The primary keywords were determined based on the viewpoints of several experts in the field of study. Subsequently, the related keywords were extracted from the PubMed database through the MESH. Although the primary keywords were considered as the basis of the study, the keywords of other related articles were used in the preliminary search and investigated by the experts. The keywords of (pharmacy services), (community pharmacy services), (retail pharmacy services), (pharmacy practice intervention) were investigated in the databases of PubMed, Google Scholar, Science Direct, Web of Science from February 1990 through September 2018. As an example, the search strategy for the PubMed is provided here: (Pharmacy [Title] OR retail pharmacy [Title] OR retail pharmacies [Title] OR community pharmacy [Title] OR community pharmacies [Title] AND (services [Title] OR education [Title] OR quality [Title] OR intervention [Title]).

The SID, Magiran, and IranMedex as national Iranian databases also were searched with the Persian equivalent of the search keywords. This search yielded in no relevant study and the retrieved studies in the Persian language were mostly about the satisfaction of the pharmacy customers. Further to the database search, the reference list of the included papers was searched for additional related articles.

**Selection of articles**

The retrieved papers were screened independently by two members of the research team according to inclusion and exclusion criteria. In case of any disagreement, a third researcher was consulted. Figure 1 shows the screening and selection process of the related papers for identifying the health-promoting functions of the pharmacies. The Preferred Reporting Items for Systematic Reviews and Meta-Analyses flowchart was followed in the selection of the studies.

**Inclusion and exclusion criteria**

The main inclusion criterion was addressing at least one function of pharmacy, other than the prescription of medicines. The other criteria were being published in the study period and in the English language. Those papers that had no full text available, such as conference papers, were excluded.

**Study quality assessment**

The Critical Appraisal Skills Program checklists were used for assessing the quality of the included studies. The assessment showed that of the 18 included studies eight had good quality\[3,6,10‑15\] and 10 had moderate quality.\[1,16‑24\] To assure uniform handling of the data, a form was used for data extraction which included title,
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The pharmacists can educate the customers miles from the pharmacies, they are able to easily access payments. Since 93% of the Americans are living five miles from the pharmacies, it is better that people have access to the pharmacies more than the general physicians. The study suggested that the pharmacists can increase the immunization rate and thus prevent many deaths. Merks et al. conducted a study in 2016 in the rural areas of the UK and found that many people did not know about the immunization services that were available in the pharmacies and thus did not utilize the services. The other study was conducted by Hurley-Kim (2018) in the US and assessed the vaccination services for those people who want to travel to other countries. The study reported that the vaccination by the pharmacies is effective in preventing the transmission of diseases from other countries to the US. Numerous people die each year due to the diseases that are preventable by the vaccines. While the pharmacies can play a positive role in this regard, the pharmacists can educate the people on the immunization, provide recommendations for vaccination, and administer the vaccines. This will prevent the deaths, elevate the health status of the society, and lower the health costs.

Characteristics of the included studies

Of the total 4156 identified records finally, 18 studies met the inclusion criteria and were included in the analysis. Figure 1 shows the screening and selection process of the studies. Table 1 shows the characteristics and main findings of the included studies. Majority of the included studies were from the USA (33.3%) and the UK (22.2%). Other studies were from Vietnam, Brazil, Australia, South Africa, India, Qatar, Canada, and Malaysia. Half of the studies (50%) had a cross-sectional nature and 27.7% were systematic reviews. In terms of time, most studies were from recent years so that two-third of the included studies were related to 2015-2018. This shows an attention to the functions of the pharmacies in recent years.

Synthetic results

The studies introduced several functions for the pharmacies that are categorized into two main categories of “health and prevention services” and the “treatment-related services.” The other major finding of this review was about the awareness and how to use the pharmacies. The health and prevention category included vaccination, screening and disease prevention, family planning, healthy lifestyle, and public health services. The treatment-related services included adherence to medication, medication consultation, prescriptions for minor pains, and emergency medical services.

Health and prevention

Vaccination

Four studies mentioned the vaccination services in the pharmacies. The study by Todd et al. in the UK used the geographic information system and reported that people have access to the pharmacies more than the general physicians. The study suggested that considering the access to the pharmacies, it is better that the identification of in-risk people and their vaccination be performed by the pharmacies, especially in deprived areas.

Bach and Goad investigated the role of American pharmacies in educating, accelerating, and immunizing. The study found that most people prefer to be vaccinated in pharmacies because of no waiting time and no visit payments. Since 93% of the Americans are living five miles from the pharmacies, they are able to easily access them. The pharmacists can educate the customers on the vaccination, be a host for immunizing and administer the vaccines according to the related laws. The study concluded that the pharmacies can increase the immunization rate and thus prevent many deaths. Merks et al. reported that only 5.8% of the participant in the UK were aware of the blood pressure control in the pharmacies. Curtiss et al. stated the blood pressure control as a function of US pharmacies.

Cancer screening and identification: The study by Havlicek and Mansell in Canada stated that many people need cancer screening tests and the pharmacists can identify the high-risk people and thus help early diagnosis of the cancers which would result in reduction in deaths due to cancer. The pharmacists can also increase the awareness of the people about cancer prevention and screening. The study stated that to do so, the pharmacists should know the risk factor of each cancer.

Cancer is a major cause of morbidity and mortality worldwide and many people die each year due to late diagnosis. Pharmacies are good places for the identification, screening, and education of the people about cancer and may increase early diagnosis of the cancer.

Prevention and control of heart diseases: Two studies reported the blood pressure control as a function of pharmacy. Merks et al. reported that only 5.8% of the participant in the UK were aware of the blood pressure control in the pharmacies. Curtiss et al. stated the blood pressure control as a function of US pharmacies.

The heart diseases are the major cause of death in the world. Providing blood pressure control and monitoring in the pharmacies may prevent or help early diagnosis of the heart diseases and thus reduce the health costs.

Results

Table 1 shows the characteristics and main findings of the included studies.

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Screening and disease prevention

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Table 1: Characteristics and main findings of the included studies on functions of the pharmacies

| Raw  | Author(s)                  | Country, year | Study design                  | Aim                                                                 | Relevant findings                                                                                       | Conclusions/recommendations                                                                 |
|------|----------------------------|---------------|-------------------------------|----------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|
| 1    | Richardson and Pollock     | UK, 2010      | Cross-sectional              | Assessing the implementation of reforms in services of public pharmacies | The government approved new services of public pharmacies which increased access of the population and decreased workload of physicians and health-care costs | Increasing the provided services of the pharmacies                                            |
| 2    | Todd et al                 | UK, 2015      | Cross-sectional              | Assessing the access to general physicians and comparing the access to pharmacies in various regions | Provision of services such as vaccination of at-risk individuals, obesity control, quitting alcohol and smoking, and providing public health services | Access of most of the population to the public pharmacies creates the opportunity to improve equity in access by providing primary health care |
| 3    | Curtiss et al              | US, 2004      | Systematic review            | Reviewing the studies on improving the services of the pharmacies | Provision of blood pressure control, lipid control, and reducing the risk of heart diseases | Studying and resolving the challenges of the pharmacies help them provide effective services and improve customer satisfaction |
| 4    | Melton and Lai             | US, 2017      | Systematic review            | Studying the services of the pharmacies and the available opportunities to increase customers’ satisfaction | Provision of additional services in the pharmacies and new services by using new technologies | Providing new services in the pharmacies help increase the customers’ satisfaction |
| 5    | Larsson et al              | Vietnam, 2006 | Cross-sectional              | Studying the distribution of medicines and the extent of enclosing the side effects of the medicines | Enclosing the side effects of the medicines is an important service of the pharmacies and defects in the role may cause health problems for the patients and the society | Powerful financial incentives exist for the pharmacies to provide medicines irrespective of the regulations |
| 6    | Pringle and Coley          | US, 2015      | Before-after interventional study | Proposing a framework for improving patients' adherence to medication | Monitoring the patients by the pharmacies after prescription resulted in increased adherence to the medication | Monitoring the adherence of the patients results in better therapeutic results and lower health costs |
| 7    | Obrei-Neto et al           | Brazil, 2016  | Systematic review            | Studying the effect of media in in-service training on the clinical services of the pharmacies | The main challenges are using online education for pharmacy workers and lack of valid tools to assess this education | Training the pharmacy workers made them provide effective services |
| 8    | Hattingh and Tait          | Australia, 2018 | Systematic review           | Studying the possibility of screening and alcohol quitting services in the pharmacies | Identifying high-risk individuals in terms of alcohol consumption. Providing primary screening and alcohol quitting services in the pharmacies require staff training and a proper place | Providing the alcohol quitting services in a private room cause clients to trust more |
| 9    | Singleton et al            | US, 2017      | Before-after interventional study | Implementing a telephone intervention to increase adherence to medication in early diabetic patients | Using telephone monitoring by pharmacy increased the adherence to medication among diabetic patients in the early stage of the disease and prevented disease progress | Slowing down the disease progress and reducing health costs of diabetic patients by telephone monitoring of drug use |
| Raw  | Author(s) | Country, year | Study design | Aim | Relevant findings | Conclusions/recommendations |
|------|-----------|---------------|--------------|-----|-------------------|-----------------------------|
| 10   | Brown et al [3] | UK, 2016 | Systematic review | Assessing the effect of pharmacy services for reducing alcohol, quitting smoking, and weight control | The services for quitting smoking and obesity control were effective but the effectiveness of the alcohol restricting services was not proved | Potential of the pharmacies for public health interventions such as weight management and smoking quitting |
| 11   | Malangu [1] | South Africa, 2014 | Review | Studying the challenges of adding new services to the pharmacies | Adding new services, such as case finding, diagnosis, prescription, and monitoring, to the pharmacies requires training courses but increases the income of the pharmacies. It also increases the responsibility of the pharmacists | Potential of the pharmacies in providing primary health care but it requires legal and political infrastructure |
| 12   | Basak and Sathyanarayana [21] | India, 2009 | Cross-sectional | Studying the situation of Indian pharmacies in the past, now, and future | Lack of awareness of people about services provided in the pharmacies and their inappropriate attitude toward the pharmacies cause them not to use the services of the pharmacies | Potential of the pharmacies in providing primary health care |
| 13   | El Hajj et al [22] | Qatar, 2011 | Cross-sectional | Studying the viewpoints of the society about the role of pharmacists and assessing the utilization and satisfaction of pharmacy services | The population has low perception about the role of the pharmacists which leads to lack of awareness on the services provided in the pharmacies and not using the services | Participants were dissatisfied with the time that the pharmacists devote to the clients and asked physicians about their pharmaceutical questions |
| 14   | Bach and Goad [6] | US, 2015 | Cross-sectional | Assessing the role of the pharmacies in increasing the vaccination coverage | Providing vaccination services in the pharmacies was successful and helped improving the health of the society. Yet it had some challenges for payment rules and training | Vaccination by the pharmacies increases the vaccine coverage |
| 15   | Merks et al [10] | UK, 2016 | Cross-sectional | Studying the attitudes of the people about the services provided in the pharmacies and providing some suggestions for increasing their awareness in this regard | Few advanced services of the pharmacies were used in the rural areas which was due to low awareness of the people about the services | People usually know the pharmacies as a place for just prescription and distribution of medicines. This requires good communication about the services provided |
| 16   | Havlicek and Mansell [15] | Canada, 2016 | Cross-sectional | Studying the role of pharmacists in monitoring and prevention of cancer | Cancer screening, providing cancer prevention education, and lifestyle modification by the pharmacies | Cancer prevention services resulted in the prevention and early identification of cancer and increased the treatment probability |
| 17   | Verma et al [23] | Malasia, 2018 | Cross-sectional | Studying the awareness of the people about weight management services in the pharmacies and its utilization | Most people did not use the weight management services of the pharmacies because they were not aware of the service | Possibility of weight management services in the pharmacies |

Contd...
Diabetes prevention and control: The study by Verma et al., in Malaysia, mentioned measuring blood glucose in pharmacy which helps control and prevention of the diabetes. Diabetes is a widespread chronic disease with an increasing prevalence in most countries particularly the developing ones. It is estimated that near half of the diabetic patients are not aware of their diabetes. This unawareness and lack of control increase the complications of the disease. But the pharmacies, by checking blood glucose, can help identifying latent diabetes disease and controlling the disease.

Family planning: One study by Malangu in South Africa reported this function for the pharmacies but the service was not free of charge.

Healthy lifestyle
Lifestyle is a pattern of behavioral choices from among various options which individuals choose according to socioeconomic conditions and easiness. Thus, choosing to smoke or not to smoke, drinking alcohol or not drinking, using a car or public transport are all parts of our choices and decision patterns that make our lifestyle. Some diseases root from the lifestyle, rather than genetics or transmission from other people. Those studies related to weight management and diet therapy, and quitting smoking and alcohol are categorized in this group.

Quitting smoking: Four studies found in this regard as mentioned below. The studies by Merks, Richardson, and Todd only mentioned the smoking quitting as a service provided in the pharmacies. But the study by Brown et al. described more details. They compared behavior therapy, nicotine replacement, and placebo and found both strategies effective. The pharmacy workers should be trained on behavior therapy and how to give consultation.

Smoking significantly increases the risk of coronary heart diseases, lung diseases, diabetes, nervous diseases such as Parkinson’s and Alzheimer’s disease, and cancers such as lung, larynx, stomach cancers. Smoking not only decreases the life expectancy and increases the medical costs of the smokers but also the people around them such as family members. Providing smoking quitting services in the pharmacies can help reduce the consequences of smoking the society and thus have a positive impact on population health.

Weight management: Three studies reported weight management as a service of pharmacies. The study by Todd et al. in 2015 in the UK mentioned controlling the obesity in pharmacies. The study stated that considering the more access of the people to the pharmacies than the general physicians, this will increase the access to these services, especially in less developed areas. The study by Brown et al. reported the diet therapy as a service provided in the pharmacies of the UK which included setting up diet, exercise plans, and consultation.

Verma et al. in 2018 studied weight management service in the pharmacies of Malaysia and reported these items: Measuring height and weight, calculating body mass index, providing education, consultation for a healthy diet and physical activity, referring to relevant health-care centers, medicine therapy, consultation for weight loss by surgery, and making professional groups for deciding for the visitors.

Overweight and obesity prepare the individuals for diseases like high blood pressure, type 2 diabetes, coronary heart disease, stroke, and liver and kidney diseases. Regarding the increasing trend of obesity and overweight, providing weight management services can be an area of interest for the pharmacies and can be helpful from the public health viewpoint. Yet, it has some challenges defining tariff, the waiting times, and preparing a proper place.

Alcohol consumption control: Three studies reported this service for the pharmacies. The studies by Todd et al. and Brown et al. mentioned that this service is provided in the pharmacies but did not provide more details about it. Hattingh et al. in a study in 2018 in Australia assessed the possibility of screening and interventions by the pharmacies for reducing alcoholism in the society. They stated that the pharmacies can be effective in the identification of individuals with high risk of alcohol consumption and then making them aware of the consequences of drinking, as long as providing education about its importance in those with chronic diseases like diabetes.
Drinking alcohol increase the risk of hepatitis, depression, high blood pressure, stroke, and some kinds of cancers.[17,20] Providing alcohol consumption control services in the pharmacies can be helpful in reducing the physical and mental health problems of the people.

The pharmacists should be trained on communication skills and professional knowledge about alcohol consumption and should provide these services with regard to privacy.[20,32]

Public health services: The studies by Richardson and Pollock and Todd et al. mentioned this function for the pharmacies. Providing public health services in the pharmacies increases access to health care and options of the individuals, and decreases the workload of the physicians and health costs of the society.[11,16]

**Treatment-related services**

Adherence to medication: Two studies had mentioned this service for the pharmacies.[13,14] The study by Pringle and Coley reported that holding educational workshops for pharmacists and training them on communication skills results in elevated motivation for providing consultation and then consulting the patients in an appropriate place with respect to their beliefs cause patients to have more adherence to the medication.[13] Singleton et al. studied 96 diabetic patients for 1 year and found that providing consultation, making reminders by smartphones, communicating on importance of each medicine in control of the disease, making them aware of costs of alternative therapies, and motivating them for preventing the consequences of diabetes lead to a considerable increase in adherence to medication and reducing disease progress.[14] Poor adherence to medication may result in poor effectiveness of treatment and waste of costs.[13,14] So, the pharmacies can play a positive role in this regard.

**Medication consultation**

Six studies reported pharmaceutical consultation which were mainly about adherence to medication, choosing and how to use the OTCs, methods of consumption, and side effects of the medicines.[13,13,14]

Providing consultation is an important service of the pharmacies which requires proper space. Pharmacists had a pivotal role in regulating medication therapy, promoting optimum use of the medicines, and minimizing the side effects of them.[30] Giving information on the method, time and amount of consumption, side effects, interactions, and contraindications of each medicine all are basic roles of the pharmacies. These services are connected with customers’ satisfaction so that some patients expressed dissatisfaction about the amount of provided information and devoted time for consultation.[22]

**Prescriptions for minor pains**

This service was mentioned in four studies.[1,10,19,22] Studies in various countries showed that most of the customers believe that treating minor pains is a necessary function of pharmacies. This function may include treating viral and bacterial infection, minor incidences, stomach problems, and allergies.[10,19,22] Malangu in South Africa stated that these services are provided for those who have the ability to pay.[1] This function of the pharmacies can decrease the workload of the specialist therapy centers, costs of treatment, and the waiting time for treatment.[1,10] This may also increase the access to health services in remote areas.

**Emergency medical services**

Only one study by Merks et al. in the UK reported this function for the pharmacies and also reported that the people were not aware of this service.[10]

**Awareness and how to use the pharmacies**

Three studies investigated the awareness of customers about the services of the pharmacies. These studies were conducted in Qatar, India, and the UK and reported that generally, people have low perception of services provided in the pharmacies and few people use the services.[10,21,22] Providing various services would be effective only when people be aware of and utilize them.[34]

A study of Basak and Sathyanarayana in India showed that most people know the pharmacies as a place of just prescription of medicines and thus did not use their consultation services. They found that the people have a low perception of the pharmacy and the services provided thus the pharmacies are faced with challenges in providing some services.[21] El Hajj et al. in Qatar found that 50% of the participants believe that physicians are the primary persons to answer their questions about medications, 70% did not expect that pharmacies have any role in monitoring and health programs and screening, 73% believe that the pharmacists do not have knowledge and time to answer the patients.[22] Merks et al. in the UK found that 84% of the participants stated that they know the pharmacy as a place of prescription of medicines, 72% as a place of redistribution of medicines, 23% as a place of specific therapies such as minor pains, infections, minor injuries, and allergies.[10]

**Innovations and limitations**

A limitation of this study was limiting the search to only English and Persian languages. This may cause some evidence to be neglected. But the time period of the search was wide enough and the major databases were searched to include every potential document.

Researches on the pharmacy services usually are concerned with the customer satisfaction but this study
systematically reviewed the services provable in the pharmacies to make them a place for health promotion.

**Conclusion**

Pharmacies are not only a place for the prescription of medicines nowadays. They had got a wider role in community health and became a place for comprehensive health care. They are easily accessible and help equitable service provision. This study identified a wide variety of functions for the pharmacies that include education, smoking quitting, diet therapy and weight management, vaccination, reducing alcohol consumption, family planning, adherence to medication, treating minor pains, emergency medical services, and screening for noncommunicable diseases such as cancer, diabetes, high blood pressure, and heart disease. Involvement of the pharmacies in the abovementioned services may result in the improved health status of the population, increased quality of life of the patients, reduced costs of treatments, and reduced workload of the physicians. Yet, it has some challenges and requires training courses for pharmacists and pharmacy workers, licensing and pricing for the services, and communicating the availability of the services.

**Acknowledgment**

This study is financially supported by the Tehran University of Medical Sciences (TUMS). The study protocol is reviewed and approved by the Ethics Committee of TUMS with the ethics code of IR.TUMS.SPH.REC.1396:4103.

**Financial support and sponsorship**

This manuscript was derived from a Ph.D. thesis in the field of Health Services Management at Tehran University of Medical Sciences (TUMS). The study is supported by TUMS. The sponsor has no role in data acquisition or interpretation.

**Conflicts of interest**

There are no conflicts of interest.

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