

## RESEARCH ON KEY FACTORS OF COMMUNITY-BASED PHARMACIES MANAGEMENT SUCCESS IN TAIWAN

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### ABSTRACT

The pharmacies in Taiwan can be divided into two main types: community-based pharmacies and hospital pharmacies. By the business and investment mode, the pharmacies can be divided into independent pharmacies and chain pharmacies. Independent pharmacies sell prescription drugs, over-the-counter drugs, health foods, basic medical supplies, and chemical products. Chain pharmacies not only cover the business of independent pharmacies, but also provide a variety of homogenous products for consumers' selections. Consumers can easily buy a variety of drugs or daily articles in chain pharmacies.

This study adopted two rounds of Modified Delphi questionnaire survey, in order to identify the key success factor of community-based independent pharmacies. Nine experts with practical experience in the industry were invited for the survey. Based on the expert consensus, this study identified 5 dimensions and 19 indicators. The Analytic Hierarchy Process (AHP) questionnaire survey was conducted on 9 experts and 11 consumers. Based on the statistical results, the key indicators were selected, the relative weight correlations were determined, and the weight ranking was obtained. The purpose was to understand the services needed by the consumers of community-based independent pharmacies. The findings can serve as reference for community-based independent pharmacies in future operation.

**Keywords:** *Independent pharmacies, chain pharmacies, Modified Delphi Method, Analytic Hierarchy Process.*

### 1. INTRODUCTION

In the past, the income of a pharmacy opened by a pharmacist was high. However, at present, the operation of pharmacies has been changed by the economic environment. Pharmacies run by pharmacists are no longer profitable as they were in the past. Why? Since the rise of pharmacy chains in Taiwan in 1980, the operation of pharmacy chains has gradually matured in 2004. Pharmacy chains are operated by large-scale enterprises, manufacturers, and suppliers from different fields, which turned the pharmacy industry in Taiwan into a competitive commercial market. Consortia intervene in pharmacy operation. Therefore, the existing space of independent pharmacies is compressed severely. Pharmacists operating pharmacies are professionals who have passed national examinations. The reason why independent pharmacies still exist is that pharmacists specialize in pharmacy and they are different from other pharmacy operators, who do not pass national accreditation and can be replaced. As a result, the interactions between independent pharmacies and the public become the key factor affecting operational effectiveness.

### 2. LITERATURE REVIEW

After the implementation of policy of "Separation of Dispensing Practice from Medical Practice," community-based pharmacies have been gradually changed from traditional drug selling model to public service-oriented direction. Therefore, the basic concept of added value to pharmacies has been developed. This section explains Ministry of Health and Welfare's perception of roles of pharmacy services and pharmacists' role.

#### 2.1 DEFINITION AND SERVICES OF COMMUNITY-BASED PHARMACIES

The development of community-based pharmacies in domestic and foreign pharmaceutical services plays a very important role in healthcare functions. Government authorities and academia both are aggressively promoting the service development of community-based pharmacies. Pharmacists at Taoyuan General Hospital, Ministry of Health and Welfare conducted a questionnaire on factors affecting the public's selection of drug dispensing site, and found that 8 factors affect the public's selection of drug dispensing site, including word-of-mouth of pharmacy, professional competence of pharmacists, pharmacists' service attitude, environment of pharmacy, drug quality, convenience of drug receiving, habit, waiting time, and expense [1] [11].

#### 2.2 COMMUNITY-BASED PHARMACY'S DRUG AND CARE CONSULTATION STATION PROTECTS THE PUBLIC'S HEALTH

Current pharmacies are no longer simply a place where drugs are purchased, and many public also purchase commodities at pharmacies. Public Health Department intends to actively interview the public through "Community-

based pharmacy's Drug and Care Consultation Stations" in Taipei County, and provides community building management committees and nursing facilities with services, such as health forums and drug consultation [2]. If the public have any concern or do not understand the drugs purchased or their usages, they can also request for the instruction on drug safety and provision of accurate knowledge of drug use from pharmacists at consultation stations [2].

### **2.3 TO COOPERATE WITH GOVERNMENT'S POLICY TO PROMOTE ELDERLY-FRIENDLY PHARMACIES**

Taiwan has become an ageing society, and the proportion of the elderly over the age of 65 has increased years by year. According to the statistics, at the end of 2013, the mean of the elderly was 11.49%, suggesting that population ageing has been increasingly severe [3].

In order to take care of the increasing elderly population, some of the counties/cities in Taiwan have promoted various policies that show concern over life and safety of the elderly. One of the policies is to invite community-based pharmacies to help change their names to "elderly-friendly pharmacies." "Elderly-friendly pharmacies" aim to make the use of advantage of wide distribution of community-based pharmacies, provide the public and the elderly with local, accessible, and affordable pharmaceutical services, improve their health concepts and behaviors, and help the elderly accurately use drugs to achieve effective control over chronic illness, assist in online registration for outpatient clinic, provide the elderly in needs with drug delivery service, and help the elderly enjoy high-quality elderly life [4]. The service content of elderly-friendly pharmacies promoted by various counties/cities in Taiwan include: free blood pressure measurement, peeling tablet into halves and sub-packaging of drug box, free drug consultation service, enlarged fonts on the drug bags, use of magnifier for free, assistance in drug delivery, provision of health consultation, and provision of colorectal cancer screening tube [5].

### **2.4 MODIFIED DELPHI METHOD**

In 1995, Murry and Hammons proposed "Modified Delphi Method," which improves the open-ended questionnaire of traditional Delphi method and replaces it with structured questionnaire. Its objective is to enable experts to focus on the issues designed. In this way, a lot of time spent on prior communication can be saved to shorten the research time [6].

During the use of Delphi method, communications and comments are repeatedly conveyed in a written manner to enable experts to reflect consistent opinions. Such a communication process is usually added, deleted or modified due to the restrictions to factors, such as time and manpower, in order to smoothly conduct a study, and is called "Modified Delphi Method" [7,8].

According to the opinions of Murry and Hammons, due to special consideration, the steps of typical Delphi method were modified, namely, the brainstorming open-ended questionnaire survey was omitted. Structured questionnaire was developed and used as round 1 questionnaire after researchers referred to a large amount of literature and made revisions. This method is called Modified Delphi Method. Murry and Hammons also indicated that, the advantage of direct use of structured questionnaire to conduct round 1 questionnaire survey is to save a lot of time. In addition, the use of structured questionnaire enables experts participating in a study to immediately focus on research theme and save the time spent on speculation about open-ended questionnaire.

### **2.5 ANALYTIC HIERARCHY PROCESS (AHP)**

Analytic Hierarchy Process (AHP) is a decision-making method developed by Thomas L. Saaty in University of Pittsburgh, Pennsylvania, U.S.A. in 1971 to assist United States Department of Defense in conducting studies. The theory of AHP is simple and practical and has been comprehensively used by research units of various countries. AHP can be used to determine the hierarchical order of all of the factors affecting an issue, and help easily understand the influence of high hierarchy on low hierarchy. AHP can also be used to objectively quantify abstract cause-and-effect relationships of an issue, which is beneficial to decision-makers' most favorable rational choice [9,10].

AHP is an analysis method to analyze and consider a complicated issue according to various dimensions in order to systematize and simplify it. During the research process, a complicated issue will be decomposed into a tree structure according to its nature and objective, and a hierarchy of mutual influence will be established. Pairwise comparison will be used to obtain the weight value of factors of various dimensions. In the end, a comprehensive assessment will be performed to compare the advantages of various dimensions. The results can be provided as reference for decision-making.

## **3. RESEARCH METHOD**

The main purpose of this study is to develop the public's criteria for assessment and selection of expected services of

community-based pharmacies in residential areas, in order to provide community-based pharmacies in residential areas with reference and suggestions on provision of services to the public. Firstly, this study analyzed the general status of pharmacy market in Taiwan. Secondly, this study used literature analysis, modified Delphi method, and AHP as research methods.

### 3.1 GENERAL STATUS OF PHARMACY MARKET IN TAIWAN

The operation of general independent pharmacies is more specific, and their types of services are more basic, such as: receiving prescriptions and selling drugs, nutritional supplements, simple medical devices, and chemicals. Nevertheless, the operational strategy of pharmacy chains is diversification operation model. The public can easily purchase general commodities, such as maternal and infant supplies, drinks, and beauty care products, in modern pharmacy chains. Pharmacy chains are operated by large-scale enterprises, manufacturers, and suppliers from different fields. Consortia intervening in pharmacy operation possess huge capital. As a result, the financial resources and product resources of independent pharmacies are significantly restricted.

The pharmaceutical industry in Taiwan has been changed significantly due to government's policy and rise of public awareness, such as national health insurance, separation of dispensing practice from medical practice, free import of drugs, internationalization of pharmaceutical retail business, improvement of consumers' educational level, and significant improvement of the public's autonomous purchase due to rich information. Because pharmacy chains can use a variety of marketing models and professions, they can replace traditional pharmacies and compress profit margins. To date, pharmacy chains have replaced traditional pharmacies with their strong competitiveness, which is similar to the situation where convenience stores have replaced traditional grocery stores.

### 3.2 RESEARCH STRUCTURE AND PROCESS AND IMPLEMENTATION STEPS

The implementation steps of this study are explained as follows:

#### Step 1: Literature analysis

This study collected domestic and foreign studies concerning pharmacy operation and pharmacists' role, and performed a literature analysis on the studies concerning meanings of pharmacies and pharmacists, pharmacists' planning process of community-based pharmacies in residential areas, and government's applicable laws and regulations. Moreover, this study preliminarily developed the questionnaire content and assessment criteria according to the suggestions provided by experts during interviews, as shown in Table 1.

Table 1: Preliminarily developed questionnaire content and assessment criteria

Hierarchy 1 (Goal)	Hierarchy 2 (Criteria)	Hierarchy 3 (Critical Factors)	Source
Research on Key Factors of Community-based Pharmacies Management Success in Taiwan	Professional competence (4)	Providing prescription dispensing	(1) [11]
		Providing consultation of drug information to the public	(2) [12]
		Providing medical information	
		Providing health consultation to the public	
	Service attitude (6)	Listening to customers' questions patiently	(1) [13] (2) [14]
		Offering premium of purchase	(3) [15]
		Greeting customers in a friendly manner	(4) [16]
		Pharmacists delivering drug to patients' home	(5) Results of field research on pharmacy chains performed by this study
		Handling consumers' complaints	
		Making phone calls to show concern over patients receiving	

		drug dispensing service	
	Community service (6)	Holding community health forums	(1) [5] (2) [16]
		Providing blood pressure measurement service at pharmacy	(3) [17] (4) Results of field research on pharmacy chains performed by this study
		Providing information on health education	
		Cooperating with the government to establish service station	
		Playing the role as disaster prevention center	
		Paying home visits to show concern over the elderly	
	Product selling (9)	Selling medical devices	(1) [11]
		Selling nutritional supplements	(2) [12]
		Selling organic food	(3) [17]
		Selling maternal and infant supplies	(4) Results of field research on pharmacy chains performed by this study
		Selling OTC	
		Selling beauty care products	
		Selling senior products	
		Providing diversified products of the same property	
	Features of marketplace (5)	Offering discounts anytime	
		Displaying products on shelves for consumers to choose on their own	(1) [1] (2) Results of field research on pharmacy chains performed by this study
		Selling products with high visibility	
		Displaying seasonal products in pharmacy	
		Selling products with high visibility	
		Establishing customer data	

Source: Compiled by this study

### Step 2: Modified Delphi Method expert questionnaire

This study used modified Delphi method to establish assessment criteria, collected relevant data, and performed literature review. This study arranged the needs as the basic criteria structure, including: hierarchy 1: goal; hierarchy 2: classification and criteria. The basic criteria structure was developed using repeated modified Delphi questionnaire surveys where the opinions of all of the experts and scholars were obtained. Afterwards, this study analyzed data to obtain results.

### (1) Progress of implementation

The number of rounds of questionnaire surveys was determined based on whether a consistent consensus is reached among experts. Lanford (1972) also suggested that 2-3 rounds of questionnaire surveys are sufficient to reach stability and a consensus among experts. Therefore, this study decided to conduct two rounds of modified Delphi questionnaire surveys [18]. If too many rounds of questionnaire surveys are conducted, experts and scholars may be unwilling to provide opinions or the return rate may be reduced. Therefore, this study decided to conduct two rounds of questionnaire surveys. The implementation procedures of modified Delphi questionnaire survey are shown in Table 2:

Table 2: Implementation procedures of Delphi questionnaire survey

Time	Work Content
From October 1, 2014; 20 days totally	The researcher visited experts personally, invited them to participate in this study, and collected suggestions provided by them in the preliminary interview. The researcher collected the basic information of experts, including gender, age, educational background, current post, and seniority in related work.
From November 1, 2014; 10 days totally	The researcher conducted round 1 questionnaire survey. The experts received round 2 questionnaire.
From November 20, 2014; 10 days totally	The researcher conducted 2 questionnaire survey. The experts received round 2 modified Delphi questionnaire and answer it.

Source: Compiled by this study

### (2) Selection of experts

This study selected experts through the introduction of researcher's friends who are pharmacists. The researcher visited experts personally for the first time, and asked them if they were willing to accept the invitation to participate in this study. After the researcher explained the intention and the experts agreed to accept the invitation, the researcher preliminarily developed the questionnaire according to the suggestions on research direction provided by experts. During the interviews, this study used Q&A to guide experts to answer questions. The round 1 modified Delphi questionnaire content was designed based on the experts' answers and suggestions.

This study selected 9 senior experts in industry. Because the experts are busy at work and their time is precious, the researcher made the best use of interview time to interview them. During the interviews, this study asked whether the 9 experts were willing to disclose their names, and all of them refused to disclose their names because their work may involve certain sensitive issues. As a result, codes were used to represent their names. All of the experts were willing to disclose the information on their service units and relevant backgrounds. The CVs of 9 experts receiving interviews are shown in Table 3.

Table 3: Information on experts receiving the interviews

Code of Experts	Service Unit/Job Title	Seniority in Related Work	Background of Experts
Expert A	Pharmacy chain; CEO & pharmacist	22 years	School of Pharmacy, Taipei Medical University Used to act as a director at Pharmacist Association
Expert B	Pharmacy chain; general manager & pharmacist	23 years	Department of Pharmacy, Chia Nan University of Pharmacy & Science Used to act as a pharmacist at a teaching hospital
Expert C	Cosmetics and pharmacy; person in charge and pharmacist	26 years	Department of Pharmacy, Chia Nan University of Pharmacy & Science Used to act as a director at Pharmacist Association
Expert D	Cosmetics and pharmacy; person in charge and pharmacist	31 years	Department of Pharmacy, Chia Nan University of Pharmacy & Science Used to act as a director at Pharmacist Association

			Association
Expert E	Cosmetics and pharmacy; person in charge and pharmacist	23 years	School of Pharmacy, China Medical University Used to act as a pharmacist at a teaching hospital
Expert F	Metropolitan pharmacy; person in charge and pharmacist	18 years	School of Pharmacy, National Taiwan University Used to act as a pharmacist at a teaching hospital
Expert G	Metropolitan pharmacy; person in charge and pharmacist	15 years	School of Pharmacy, Taipei Medical University Used to act as a pharmacist at a regional hospital
Expert H	Residential pharmacy; person in charge and pharmacist	25 years	School of Pharmacy, Kaohsiung Medical University Used to act as a director at Pharmacist Association
Expert I	Residential pharmacy; person in charge and pharmacist	17 years	School of Pharmacy, China Medical University Used to act as a pharmacist at a teaching hospital

Source: Compiled by this study

**(3) Questionnaire content** This study found out the factors affecting the operation of residential pharmacies based on literature analysis and experts' suggestions in the first interviews, and developed the pre-test questionnaire on assessment and selection of factors [improving the operational performance of independent community-based pharmacies in Taiwan]. The reason why this study developed the modified Delphi questionnaire according to experts' opinions was that this study hoped that the experts could effectively focus on the core issue. In addition, the low return rate of questionnaires caused by experts' difficulties in answering open-ended questionnaire that affects validity and reliability of a study could be reduced.

Therefore, round 1 questionnaire was designed as a close-ended questionnaire based on literature analysis and experts' suggestions in the first interviews. The questionnaire items would not be deviated from core issue. Therefore, the experts would not feel that there was any missing information, and could answer questions smoothly.

#### **(4) Measurement scale for the questionnaire**

This study used 5-point Likert scale for measurement of questionnaire, and divided the level of importance into [very unimportant] (1 point), [unimportant] (2 points), [neutral] (3 points), [important] (4 points), and [very important] (5 points) to represent experts' perception of level of importance of various items.

#### **(5) Analyses on questionnaire data**

After the experts completed and returned the questionnaires, this study started to perform statistical analyses on experts' perception of level of importance of various factors to determine whether they reached a consistent consensus. The statistical analysis methods included mean, standard deviation, and coefficient of variance (C.V.) of level of importance. The calculation of C.V. is standard deviation/mean, as shown in the following formula:

$$CV = \frac{\sigma}{\mu} \quad \sigma = \text{standard deviation} \quad \mu = \text{mean}$$

This study calculated the results. The smaller the CV was, the higher the consistent consensus reached among experts and scholars was (Feng, 2006) [19].

### Step 3: AHP

This study developed the assessment criteria of basic hierarchical dimensions according to the results of Delphi questionnaire, and then used AHP to analyze the relative weight of assessment factors, in order to develop the most suitable assessment and selection criteria “improving operational performance of independent community-based pharmacies in Taiwan.”

#### (1)AHP questionnaire design

According to the final results of two rounds of modified Delphi questionnaire surveys on experts, this study developed the AHP questionnaire, and invited experts and the public to complete the questionnaires, in order to investigate the public’s criteria for assessment and selection of residential pharmacies. This study calculated the weight of various factors based on the results. Moreover, this study used AHP research method to perform pairwise comparison on factors of various hierarchies. This study used Hierarchy 1 as the main goal, and then performed pairwise comparison on factors of hierarchy of sub-goal. Furthermore, this study performed pairwise comparison on the level of importance of factors of various hierarchies. According to the operating principles of AHP proposed by Satty, when there are  $n$  factors, pairwise comparison should be performed for  $n(n-1)/2$  times.

#### (2)Assessment scale for AHP

Chen (2008) indicated that, basically, the assessment scale for AHP was divided into 5 levels: “absolutely important,” “very important,” “important,” “slightly important,” and “equally important.” According to the suggestions of Saaty and Vargas (1982), a 9-point scale should be used for measurement. Therefore, this study used 1, 3, 5, 7, and 9 points as measurement values. In addition, the factors whose importance in positive assessment was between two values would be assessed as 2, 4, 6, and 8 points.

#### (3)Calculation of weights of factors of various hierarchies

This section includes two parts: development of pairwise matrix and calculation of eigenvalues and eigenvectors.

##### 1)Development of pairwise comparison matrix:

This study calculated the overall geometric mean of the data collected from questionnaires, and summarized the overall score of decision-making of expert group. This study also developed the pairwise comparison matrix  $A$  of values provided by experts.

##### 2)Calculation of eigenvalues and eigenvectors:

This study calculated the eigenvectors and eigenvalues according to the theoretical basis of eigenvectors, and obtained the relative weight of various factors.

##### 3)Consistency test:

Theoretically, it is necessary to hypothesize that matrix  $A$  is a matrix meeting consistency. However, the data of questionnaire were completed by subjects according to their subjective awareness and judgment. Therefore, matrix  $A$  might not necessarily be in line with the principle of consistency. The assessment results had to pass the consistency test to reflect that the subjects’ judgments were consistent; otherwise, the questionnaire should be viewed as an invalid questionnaire.

## 4. RESEARCH RESULTS

The research theme is “improving the operational performance of independent community-based pharmacies in Taiwan.” This study summarized the correlation between independent pharmacies and the public, and determined the level of importance of factors according to the suggestions provided by experts and the interview data of the public over the age of 50, in order to understand what kind of satisfactory services independent pharmacies should provide to the public to improve operational performance.

### 4.1 ANALYSIS RESULTS OF MODIFIED DELPHI METHODS

The questionnaire content was designed for “improving the operational performance of independent community-based pharmacies in Taiwan.” All of the items were developed according to literature review and the feedbacks and opinions provided by experts in the first interview. Based on the said data and the collected experts’ opinions, this study preliminarily developed 5 dimensions and 30 factor as directions of questionnaire design to conduct rounds 1 & 2 modified Delphi questionnaire surveys.

This study developed 5 major dimensions and 19 assessment criteria of the modified Delphi questionnaire survey according to experts’ comments. 11 criteria failed to meet the standards, and were deleted, as shown in Table 4

Table 4: Results of deletion of items in rounds 1 & 2 Modified Delphi Method expert questionnaire survey

	Items	Mean	C.V	SD	Preserved or deleted
Items deleted in round 1	Offering premium of purchase	1.5	0.5	0.76	Deleted
	Providing information of health education	2.89	0.44	1.27	Deleted
	Playing the role as disaster prevention center	2.0	0.56	1.12	Deleted
	Selling organic food	2.0	0.5	1.0	Deleted
	Selling maternal and infant supplies	2.0	0.56	1.12	Deleted
	Selling beauty care products	1.67	0.52	0.87	Deleted
	Selling products with high visibility	2.56	0.52	1.33	Deleted
Items deleted in round 2	Handling consumers' complaints	3.44	0.36	1.24	Deleted
	Providing diversified products of the same property	3.44	0.36	1.24	Deleted
	Offering discounts anytime	4.0	0.31	1.22	Deleted
	Displaying seasonal products in pharmacy	3.89	0.33	1.27	Deleted

Source: Compiled by this study

After the investigations on various criteria in modified Delphi questionnaire surveys, this study developed 5 major dimensions and 19 assessment criteria, including 4 criteria of “professional competence,” 4 criteria of “service attitude,” 4 criteria of “community service,” 4 criteria of “product selling,” and 3 criteria of “features of marketplace.” Therefore, this study developed the hierarchical structure to perform the analyses in the next stage, as shown in Figure 1.

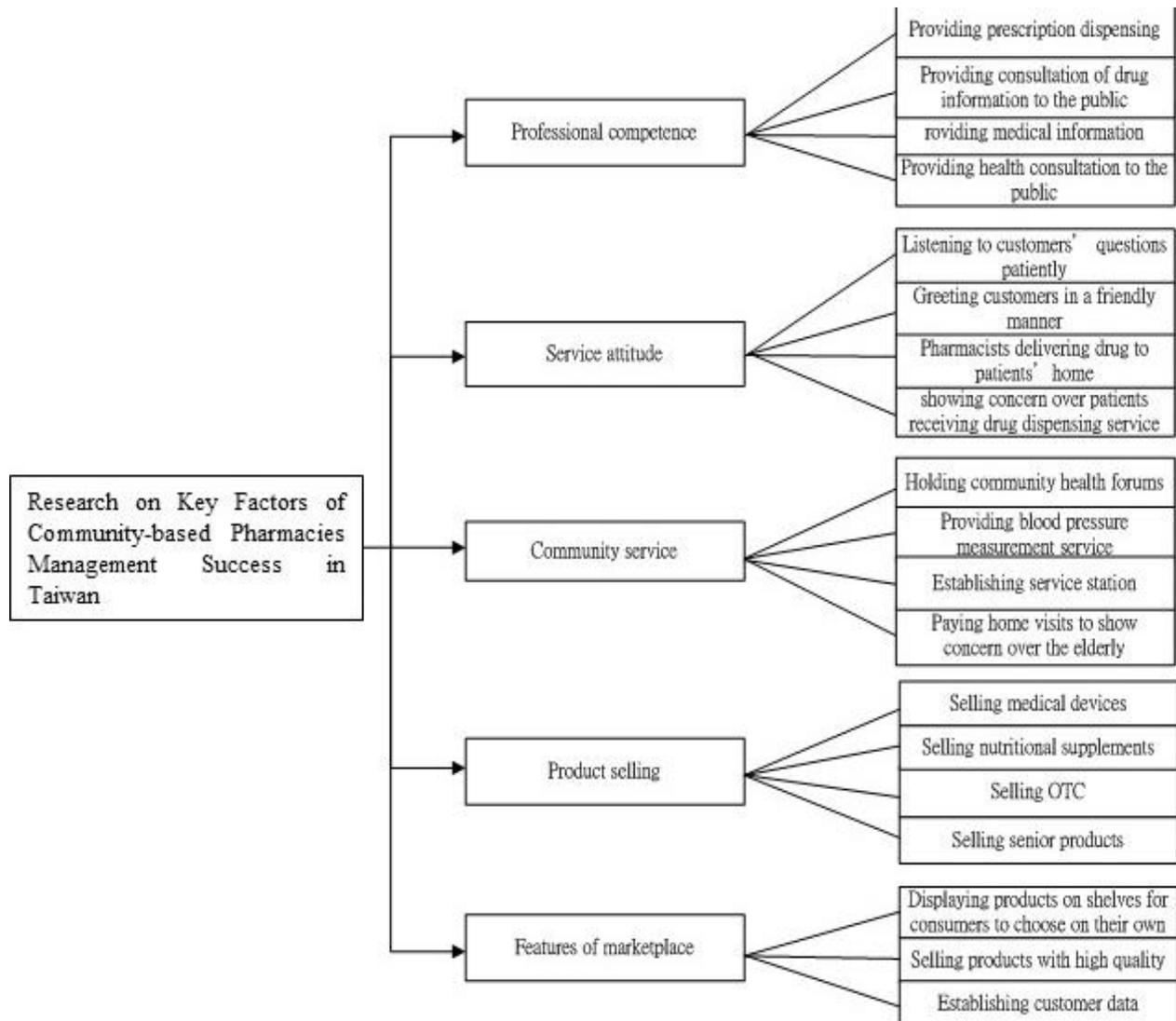


Figure 1: Modified structure of improving operational performance of independent community-based pharmacies

#### 4.2 ANALYSIS RESULTS OF AHP

This study developed 5 major dimensions and 19 assessment criteria using the modified Delphi questionnaire surveys, and then performed the analyses in the next stage. The use of AHP is based on the results of modified Delphi questionnaire surveys.

The 9 experts participating in the AHP questionnaire survey in this study were the same as those participating in the modified Delphi questionnaire survey. In addition, 11 residents in Chungli City also participated in the AHP questionnaire survey. Therefore, experts and residents, with 20 subjects totally, participated in the AHP questionnaire survey.

This study developed a pairwise comparison matrix using the AHP questionnaire survey, and used software of Excel to obtain relative weight and order of level of importance. The data were obtained based on the hierarchical consistency proposed by Saaty where the C.I.  $\leq 0.10$  is acceptable error. In addition, this study used consistency ratio (C.R.) as the criterion for measurement of consistency of pairwise comparison matrix. Saaty [9] suggested that, if C.R.  $< 0.1$ , the consistency of pairwise comparison matrix is within a reasonable scope and decision-making behavior can be continued. However, if C.R.  $> 0.1$ , decision-making behavior may be a random model and comparison matrix has to be re-assessed. Table 5 is the statistical analysis on weight of factors improving the operational performance of independent community-based pharmacies in Taiwan using the AHP.

Table 5: Statistical analysis on weight of factors improving the operational performance of independent community-based pharmacies in Taiwan

Goal	Criteria	Weight of criteria	Sub-criteria	Weight of sub-criteria	Weight x weight	Order
Research on Key Factors of Community-based Pharmacies Management Success in Taiwan	Professional competence	0.2397	Providing prescription dispensing	0.2901	0.0695	2
			Providing consultation of drug information to the public	0.2654	0.0636	3
			Providing medical information	0.2467	0.0591	7
			Providing health consultation to the public	0.1978	0.0474	14
	Service attitude	0.2247	Listening to customers' questions patiently	0.2548	0.0572	9
			Greeting customers in a friendly manner	0.2683	0.0603	5
			Pharmacists delivering drug to patients' home	0.2571	0.0578	8
			Making phone calls to show concern over patients receiving drug dispensing service	0.2198	0.0494	11
	Community service	0.2494	Holding community health forums	0.2260	0.0564	10
			Providing blood pressure measurement service at pharmacy	0.2383	0.0594	6
			Establishing service station for the public	0.2428	0.0606	4
			Paying home visits to show concern over the elderly	0.2928	0.0730	1
	Product selling	0.1841	Selling medical devices	0.2242	0.0413	16
			Selling nutritional supplements	0.2681	0.0494	12
			Selling OTC	0.2600	0.0479	13
			Selling senior products	0.2477	0.0456	15
	Features of marketplace	0.1022	Displaying products on shelves for consumers to choose on their own	0.3580	0.0366	17
			Selling products with high quality	0.3190	0.0326	19
			Establishing customer data	0.3230	0.0330	18
			1		5	1

Source: Compiled by this study

According to the results of questionnaire survey on both experts and the public, the analysis on weight of 5 major dimensions and 19 important assessment criteria for improving operational performance of independent community-based pharmacies can help provide new competitive thoughts to practical operation and management and develop the future operational model for independent pharmacy operators.

## 5. CONCLUSION AND SUGGESTIONS

The main purpose of this study is “improving the operational performance of independent community-based pharmacies in Taiwan.” This study collected data, analyzed the operational advantages of modern maternal and infant pharmacies and pharmacy chains, and developed the criteria for future operation of community-based pharmacies in residential areas. After the modified Delphi questionnaire surveys and AHP questionnaire survey, this study understood the level of importance of criteria, and further developed the important assessment criteria and correlation of relative weight as reference for independent community-based pharmacies to develop future operational strategies and planning. This study investigated what are the meanings and satisfactory services provided by good community-based pharmacies as perceived by the public based on literature review, as well as regulations and expectations towards community-based pharmacies of Department of Health, Taiwan, and Department of Public Health of various county/city governments. This study developed 5 major dimensions of operational assessment as main criteria to develop factors “improving operational performance of independent community-based pharmacies.” After two rounds of modified Delphi questionnaire surveys were used to interview 9 experts, the experts reached a consistent consensus. In this end, this study used AHP questionnaire to investigate 9 experts and 11 residents, screened out important assessment criteria according to statistical analysis on data, and completed the correlation of relative weight.

### 5.1 CONCLUSION

This study used modified Delphi questionnaire survey to find out that there are a total of 5 major dimensions that may improve operational performance of independent community-based pharmacies in Taiwan. Afterwards, this study used AHP to obtain the order of “weight of 5 main criteria,” including: “community service (weight: 0.2494),” “Professional competence (weight: 0.2397),” “service attitude (weight: 0.2247),” “product selling (weight: 0.1841),” “features of marketplace (weight: 0.1022).” The data showed that, the experts and the public suggested that, the order of level of importance of main criteria that may improve the operational performance of independent community-based pharmacies is “community service,” “professional competence,” and “service attitude.” The observation showed that these three criteria all belong to service dimension, while other two criteria belong to the dimension of commercial behavior.

The experts and the public suggested that, in addition to basic professional competence, it is more important for community-based pharmacies to provide community service that can win recognition of the public. Therefore, community-based pharmacies should focus on community service. In terms of current status of pharmacies in Taiwan, the quantity of pharmacies has exceeded the demand of the public. Pharmacies without differentiation operation may be easily replaced.

The order of level of importance of main criteria with top1 to 3 comprehensive weight is shown in Table 6. The calculation formula is as follows:

$$\text{Weight of main criteria} * \text{weight of sub-criteria} = \text{comprehensive weight}$$

Table 6: Main criteria with top 1 to 3 comprehensive weight

Main criteria	Sub-criteria	Comprehensive weight	Order
Community service	Paying home visits to show concern over the elderly	0.0730	1
Professional competence	Providing prescription dispensing	0.0695	2
Professional competence	Providing consultation of drug information to the public	0.0636	3

Source: Compiled by this study

As shown in Table 6, the experts and the public highly assessed “paying home visits to show concern over the elderly.” Providing prescription dispensing and providing consultation of drug information to the public of professional competence were top 2 and top 3, respectively. According to the interviews, strictly speaking, pharmacies do not directly profit from paying home visits to show concern over the elderly. However, it can help pharmacists win residents’ recognition and further indirectly give the public a reason to purchase products/drugs in pharmacies.

Community-based pharmacies are the guardians to public health. If community-based pharmacies can cooperate with government's policies, they can make contributions to society and pharmacists can assume their social responsibility, which may further create substantial commercial interests for pharmacies in the future.

## 5.2 SUGGESTIONS

This study used AHP to obtain the ranking of factors whose weight are top1 to 19. However, factors with low ranking are also important because they are also factors that may improve the operational performance of independent community-based pharmacies. In order to improve operational performance, it is necessary to take into account these 19 factors. After all, these 19 factors are the important criteria as analyzed by experts. These criteria are the standards for improving operational performance of independent community-based pharmacies. Therefore, the order of weight of criteria can be provided as reference for operators to focus on in operation and management.

Past community-based pharmacies may focus on commercial interests, and ignore the importance of making contributions to the society. In order to improve the operational performance of independent community-based pharmacies, efforts in different aspects have to be made. Making contributions to the society can create opportunities of future operation and development for pharmacies. Although making contributions to the society cannot significantly improve operational performance of pharmacies in a short period of time, it can lay a foundation for pharmacies operated by pharmacists.

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