Reprint from The Review of DIABETIC STUDIES Vol 20 No 2 2024

The Review of DIABETIC STUDIES

RESEARCH

A Cross-sectional Study on the Role of Community Pharmacists in Diabetic Patient Counselling and Health Education Services

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Manuscript Submitted July 28, 2024; Resubmitted September 04, 2024; Accepted September 10, 2024

■ Abstract

Background: The purpose of this study was to assess the role of community pharmacists in patient-centered activities and health education services for patients with type 2 diabetes mellitus, and to identify the barriers involved in the process of health education services. **Methods:** A descriptive, cross-sectional study was conducted in the Klang Valley involving 254 community pharmacists. Data collection was done by a self-administered questionnaire. **Results:** Out of 254 participants, most of the pharmacists were females (n=163; 64.2%), of Chinese ethnicity (n=218; 85.8%) and possessed a bachelor's degree (n=211; 83.1%). Most of the pharmacists attended to counsel patients mainly on the diabetic diet (n=252; 99.2%), diet management (n=249; 98.0%), timing and administration of medications (n=245; 96.5%), weight control (n=242; 95.3%), symptoms and treatment of hypoglycaemia (n=236; 92.9%) and foot care (n=205; 80.7%). The pharmacists identified the common concerns of diabetic patients as retinopathy (n=248; 97.7%) and nephropathy (n=246; 96.9%). **Conclusion:** The most identified barriers involved in the process of health education services were the cost of counselling, diabetic diet-related services, and patients' experience with the side effects of medications. A well-structured periodical training is required to equip community pharmacists to deliver these specialised services effectively for better patient care.

Keywords: Barriers, Community Pharmacy, Complications; Diabetes, Health Education.

1. Introduction

Despite the seriousness of the condition and the use of contemporary technologies in diabetes treatment and management, its prevalence is increasing at an alarming rate globally [1]. It has also captured global health attention due to the escalating prevalence rate, the complication of co-morbidities, and mortalities [2]. In developing countries like Malaysia, adults aged between 20 and 79 years are reported to have an increasing number of diabetes cases, with a prevalence of 17.5% in 2015 [3]. With a projected prevalence of 31.3%, diabetes is anticipated to impact 7 million Malaysian adults aged 18 and over by 2025, posing a significant risk to public health. Previous studies have shown that Malaysia has a diabetes prevalence ranging from 7.3% to 23.8% [4, 5]. It has been reported that the prevalence rate of diabetes in Asian settings is significantly higher in the intermediate age group compared to western settings, which showed the highest prevalence of diabetes in the older age group of 40-59 years [6-9]. The differences in the prevalence rate of diabetes in younger people in Asian settings compared to their western counterparts can be attributed to variations in lifestyle, socioeconomic status, and genetic differences among Asian populations over the past few decades [10]. Although chronic complications of diabetes are known to impact the quality of life of diabetic patients, more efforts need to be made to address this issue.

A multidisciplinary team approach to managing diabetes is essential for improving control and outcomes for patients with diabetes. Collaboration among physicians, nurses, dieticians, and pharmacists is necessary to ensure proper patient care and effective diabetes management. This includes educating patients about their disease, teaching them how to self-monitor their blood glucose levels, and providing guidance on special dietary regulations for diabetes patients. Recent studies have demonstrated that a pharmacist's involvement in a multidisciplinary team can lead to lower blood glucose levels [11-13], empower

patients to self-manage their conditions, and improve patient satisfaction and quality of life.

International diabetes care has recognized the importance of the role of pharmacists in diabetes management [13, 14]. Community pharmacists may offer a variety of public health services, such as medication management, education, and behavioural counselling, in addition to dispensing medication [15, 16]. Therefore, it is encouraged to implement community pharmacist intervention programmes for diabetes care in Malaysia.

However, it has been reported that some challenges are faced by community pharmacy settings in providing public health services to patients. For instance, patient reluctance to use pharmacy assistance due to accessibility issues and the lack of pharmacy services in hospitals are two factors that significantly contribute to the subpar performance of pharmacy services in hospitals [17, 18].

Therefore, this study aimed to understand the current practice scenario of diabetic patient counselling in community pharmacist settings and to identify gaps in health education services provided by community pharmacists.

2. Materials and Methods

2.1. Study Design

A cross-sectional survey was conducted in the community pharmacy settings of Klang Valley, Malaysia over a period of 6 months.

2.2. Study Participants and Sampling

The sample size was estimated using the Raosoft® sample size calculator, considering the total number of community pharmacies in the Klang Valley region, which was 740. Therefore, the estimated sample size was 254. A convenience sampling method was used to recruit the necessary sample size.

2.3. Inclusion and Exclusion Criteria

Registered pharmacists working at community pharmacies with a minimum diploma or bachelor's degree in pharmacy, who were willing to participate in this study by providing written informed consent were included. Community pharmacists who were unable to provide written informed consent for any reason were excluded from the study.

2.4. Study Instrument

In this study, a self-developed, structured, and validated questionnaire was utilized. Before the main study, a pilot study was conducted with 30 participants, and the Cronbach's alpha value was observed to be 0.820.

2.5. Data Collection

A self-administered questionnaire was distributed to pharmacists working in community pharmacies in the Klang Valley region. The community pharmacists working in the above area were requested to participate in this survey. Written informed consent from the participants was obtained before enrolling them in the study. All the information obtained from participants was kept confidential.

A self-administered questionnaire was distributed to pharmacists working in community pharmacies in the Klang Valley region. Community pharmacists in the area were asked to participate in the survey. Written informed consent was obtained from all participants before enrolling them in the study. All information obtained from participants was kept confidential.

2.6. Statistical Analysis

Data were summarized using descriptive statistics to show the characteristics of the respondents and the responses to each question, reported in frequencies and percentages. The association between two categorical variables was examined using the chi-square test, with a p-value of < 0.05 considered statistically significant. Data analysis was conducted using IBM SPSS Statistics software version 26. This study has been approved by the ethical committee of IMU (approval number: MPP I-2018-08).

3. Results

A total of 254 questionnaires were distributed, all of which were completed by community pharmacists. Among the respondents, the majority were female (n=163; 64.2%), of Chinese ethnicity (n=218; 85.8%) and held a bachelor's degree (n=211; 83.1%). Nearly 50% of the pharmacists were fresh graduates with less than four years of experience. Most pharmacies reported filling less than 50 prescriptions for diabetic patients per day, and most pharmacists counseled between one to nine diabetic patients daily. Further details can be found in Table 1.

Table 1: Sociodemographic Characteristics and Professional Practices of the Respondents (n=254).

Characteristics	**n (%)**
Mean age (years)	33.0 ± 8.38
Gender	
Male	91 (35.8)
Female	163 (64.2)
Ethnicity	
Malay	18 (7.1)
Chinese	218 (85.8)
Indian	16 (6.3)
Others	2 (0.8)
Practice site	
Primary care	215 (84.6)
Secondary care	39 (15.4)
Others	-
Educational Qualification	
Diploma	5 (2.0)
Bachelor	211 (83.1)
Master	38 (15.0)
Doctorate	-
Year of experience as a community pharmacist	
1-4 years	124 (48.8)
5-9 years	63 (24.8)
>10 years	67 (26.4)
Average prescriptions filled per day	
1-49	214 (84.3)
50-99	25 (9.8)
100-149	9 (3.5)
150-199	3 (1.2)
>200	3 (1.2)
The average number of diabetes patient counseling per day	
1-9	175 (68.9)
10-19	52 (20.5)
20-29	13 (5.1)
30-39	10 (3.9)
40-49	1 (0.4)
>50	3 (1.2)

Community pharmacists reported that they were generally providing various services related to diabetic

counselling and health education. When looking at their experience in professional courses related to diabetes management, almost 70% had attended one, and nearly all planned to attend one in the near future. Most pharmacists managed to counsel patients mainly on a diabetic diet (n=252; 99.2%), diet management (n=249; 98.0%), timing and administration of medications (n=245; 96.5%), weight control (n=242; 95.3%), symptoms and treatment of hypoglycemia (n=236; 92.9%), and foot care (n=205; 80.7%).

Education on the importance of screening was primarily focused on neuropathy (n=235; 92.5%), followed by retinopathy (n=230; 90.6%), and then nephropathy (n=225; 88.6%). More than 90% of the pharmacists reported that their contribution could ensure the basic medical needs of diabetic patients (n=241; 94.9%) and reduce medication side effects (n=235; 92%). The details can be found in Table 2.

Table 2: Levels of Involvement of Community Pharmacists in Counselling and Health Promotion Services (n=254).

Current Diabetic Management Components Available	Yes n (%)	No n (%)
Experience in attending diabetes management course/workshop/seminar/conference	176 (69.3)	78 (30.7)
Future plan to attend diabetes management course/workshop/seminar/conference	242 (95.3)	12 (4.7)
Did you counsel the patient on:		
Diet management	249 (98.0)	5 (2.0)
Diabetic diet	252 (99.2)	2 (0.8)
Exercise	240 (94.5)	14 (5.5)
Weight control	242 (95.3)	12 (4.7)
Promote smoking cessation	170 (66.9)	84 (33.1)
Used of Herbal and OTC medication in diabetes management	201 (79.1)	53 (20.9)
Foot care	205 (80.7)	49 (19.3)
Right timing and administration of Medication	245 (96.5)	9 (3.5)
Storage of antidiabetic medication	188 (74.0)	66 (26.0)
Missed oral antidiabetic dose	186 (73.2)	68 (26.8)
Symptoms and treatment of hypoglycemia	236 (92.9)	18 (7.1)
Stress, tension and other illness	154 (60.6)	100 (39.4)
Education on the importance of continuous screening for:		
i) nephropathy	225 (88.6)	29 (11.4)
ii) retinopathy	230 (90.6)	24 (9.4)
iii) neuropathy	235 (92.5)	19 (7.5)
iv) others	18 (7.1)	236 (92.9)
The contribution of community pharmacists could guarantee the basic medical needs of diabetic patient.	241 (94.9)	13 (5.1)
Patient counselling regarding the medicines could reduce the medication side effects	235 (92.5)	19 (7.5)

Table 3 outlines the concerns and barriers faced by community pharmacists in improving the health of diabetic patients. Pharmacists have identified that the most common concerns among diabetic patients are retinopathy (n=248; 97.7%) and nephropathy (n=246; 96.9%). According to pharmacists, the top priorities for improving patient knowledge in diabetic management are diet (n=129; 50.8%) and compliance (n=113; 44.5%). Pharmacists also reported that they most frequently counsel patients on diet and compliance in diabetes management, with 138 (54.3%) focusing on diabetes diet and 99 (39.0%) on overall compliance. The main barriers to providing health education services include the cost of counselling (n=239; 94.1%), diabetic diet-related services, and patients' past experiences with medication side effects (n=246; 96.9%).

Table 3: Contribution, Concerns, and Barriers of Community Pharmacies for Improving the Health of Diabetic Patients (n=254).

Question	N (%)
What are the common concerns of diabetic patients visiting to your pharmacy	
Side effect	59 (23.2)
Uncontrolled blood glucose	155 (61.0)
Wound foot	24 (9.4)
Neuropathy	35 (13.8)
Retinopathy	248 (97.6)
Nephropathy	246 (96.9)
Complication	28 (11.0)
Unsure	51 (20.1)
Diabetic diet	47 (18.5)
As a priority which component is the most important to improve patient knowledge about the diabetes management	
Diet	129 (50.8)
Compliance	113 (44.5)
Exercise	47 (18.5)
Counselling	48 (18.9)
Disease education	78 (30.7)
Others SMBG	34 (13.4)
Which type of above-mentioned components you counsel most of the time in diabetic patients	
Compliance	99 (39.0)
Diet	138 (54.3)
Exercise	43 (16.9)
Counselling	53 (20.9)
Others	50 (19.7)
What are the various barriers involved in the process of health education services	
Non-compliance	33 (13.0)
Ignorant	88 (34.6)
Language barrier	56 (22.0)
Time	88 (34.6)
Literacy	56 (22.0)
Cost of counselling	239 (94.1)
Diabetic diet-related services, and past experience with the side effects of medications	246 (96.9)

Tables 4 and 5 describe the association between the level of involvement of community pharmacists by gender, practice site, education level, and years of experience. Gender showed a significant difference in providing education on the importance of continuous screening for nephropathy, with female pharmacists reporting higher importance compared to male pharmacists, which was statistically significant (p=0.027). Primary care pharmacists are significantly more likely to provide counselling on diabetic diet than secondary care pharmacists (p=0.001).

Table 4: Association between the Level of Involvement of Community Pharmacists and their Practice Sites (n=254).

Question/Practice Site	Primary Care n (%)	Secondary Care n (%)	P value
Average number of counselling patients per day			
1-19	194 (85.5)	33 (14.5)	0.143
20-39	19 (82.6)	4 (17.4)	
>40	2 (50.0)	2 (50.0)	
Experience on attending diabetes management course/workshop/seminar/conference			
Yes	145 (82.4)	31 (17.6)	0.134
No	70 (89.7)	8 (10.3)	
Future plan to attend diabetes management course/workshop/seminar/conference			
Yes	206 (85.10	36 (14.9)	0.342
No	9 (75.0)	3 (25.0)	
Did you counsel the patient on;			
Diet management			
Yes	210 (84.3)	39 (15.7)	0.336
No	5 (100)	0 (0)	
Diabetic diet			
Yes	215 (85.3)	37 (14.7)	0.001
No	0 (0)	2 (100)	
Exercise			
Yes	201 (83.8)	39 (16.3)	0.101
No	14 (100)	0 (0)	
Weight control			
Yes	204 (84.3)	38 (15.7)	0.489
No	11 (91.7)	1 (8.3)	
Promote smoking cessation			
Yes	143 (84.1)	27 (15.9)	0.740
No	72 (85.7)	12 (14.3)	
Used of Herbal and OTC medication in diabetes management			
Yes	172 (85.6)	29 (14.4)	0.425
No	43 (81.1)	10 (18.9)	
Foot care			
Yes	173 (84.4)	32 (15.6)	0.817
No	42 (85.7)	7 (14.3)	
Right timing and administration of Medication			
Yes	207 (84.5)	38 (15.5)	0.719
No	8 (88.9)	38 (15.5)	
Storage of antidiabetic medication			
Yes	160 (85.1)	28 (14.9)	0.731
No	55 (83.3)	11 (16.7)	
Missed oral antidiabetic dose			
Yes	157 (84.4)	29 (15.6)	0.862
No	58 (85.3)	10 (14.7)	
Symptoms and treatment of hypoglycemia			
Yes	201 (85.2)	35 (14.8)	0.402
No	14 (77.8)	4 (22.2)	
Stress, tension and other illness			
Yes	131 (85.1)	23 (14.9)	0.818
No	84 (84.0)	16 (16.0)	
Education on the importance of continuous screening for:			
i) nephropathy			
Yes	189 (84.0)	36 (16.0)	0.427
No	26 (89.7)	3 (10.3)	
ii) retinopathy			
Yes	194 (84.3)	36 (15.7)	0.684
No	21 (87.5)	3 (12.5)	
iii) neuropathy			
Yes	201 (85.5)	34 (14.5)	0.168
No	14 (73.7)	5 (26.3)	
iv) others			
Yes	12 (66.7)	6 (33.3)	
The contribution of community pharmacist could guarantee the basic medical needs of the diabetic patient?			
Strongly agree	92 (88.5)	12 (11.5)	0.355
Agree	111 (81.0)	26 (19.0)	
Disagree	10 (90.9)	1 (9.1)	
Strongly disagree	2 (100.0)	0 (0)	
The patient counselling regarding the medicines could reduce the medication side effects			
Strongly agree	92 (91.1)	9 (8.9)	0.031
Agree	105 (78.4)	29 (21.6)	
Disagree	15 (93.8)	1 (6.3)	
Strongly disagree	3 (100)	0 (0)	

Table 5: Association between the Level of Involvement of Community Pharmacists and their Educational Level (n=254).

Question/Level of Education	Diploma n (%)	Bachelor n (%)	Master n (%)	P value
Average number of counselling patients per day				
1-19	2 (0.9)	190 (83.7)	35 (15.4)	0.000
20-39	3 (13.0)	19 (82.6)	1 (4.3)	
>40	0 (0)	2 (50.0)	2 (50.0)	
Experience on attending diabetes management course/workshop/seminar/conference				
Yes	4 (2.3)	143 (81.3)	29 (16.5)	0.502
No	1 (1.3)	68 (87.2)	9 (11.5)	
Future plan to attend diabetes management course/workshop/seminar/conference				
Yes	5 (2.1)	202 (83.5)	35(14.5)	0.550
No	0 (0)	9 (75.0)	3 (25.0)	
Did you counsel the patient on;				
Diet management				
Yes	5 (2.0)	206 (82.7)	38 (15.3)	0.595
No	0 (0)	5 (100)	0 (0)	
Diabetic diet				
Yes	5 (2.0)	210 (83.3)	37 (14.7)	0.375
No	0 (0)	1 (50)	1 (50)	
Exercise				
Yes	5 (2.1)	199 (82.9)	36 (15.0)	0.857
No	0 (0)	12 (85.7)	2 (14.3)	
Weight control				
Yes	5 (2.1)	202 (83.5)	35 (14.5)	0.550
No	0 (0)	9 (75.0)	3 (25)	
Promote smoking cessation				
Yes	3 (1.8)	135 (79.4)	32 (18.8)	0.048
No	2 (2.4)	76 (90.5)	6 (7.1)	
Used of Herbal and OTC medication in diabetes management				
Yes	3 (1.5)	169 (84.1)	29 (14.4)	0.494
No	2 (3.8)	42 (79.2)	9 (17.0)	
Foot care				
Yes	2 (1.0)	174 (84.9)	29 (14.1)	0.045
No	3 (6.1)	37 (75.5)	9 (18.4)	
Right timing and administration of Medication				
Yes	4 (2.1)	156 (83.0)	28(14.9)	0.061
No	1 (1.5)	55 (83.3)	10 (15.2)	
Storage of antidiabetic medication				
Yes	4 (1.6)	203 (82.9)	38 (15.5)	0.953
No	1 (11.1)	8 (88.9)	0 (0)	
Missed oral antidiabetic dose				
Yes	4 (2.2)	151 (81.2)	31 (16.7)	0.413
No	1 (1.5)	60 (88.2)	7 (10.3)	
Symptoms and treatment of hypoglycemia				
Yes	5 (2.1)	197 (83.5)	34 (14.4)	0.568
No	0 (0)	14 (77.8)	4 (22.2)	
Stress, tension and other illness				
Yes	4 (2.6)	128 (83.1)	22 (14.3)	0.636
No	1 (1.0)	83 (83.0)	16 (16.0)	
Education on the importance of continuous screening for:				
i) nephropathy				
Yes	3 (1.3)	191 (84.9)	31 (13.8)	0.036
No	2 (6.9)	20 (69.0)	7 (24.1)	
ii) retinopathy				
Yes	3 (1.3)	194 (84.3)	33 (14.3)	0.038
No	2 (8.3)	17 (70.8)	5 (20.8)	
iii) neuropathy				
Yes	5 (2.1)	200 (85.1)	30 (12.8)	0.002
No	0 (0)	11 (57.9)	8 (42.1)	
iv) others	1 (5.6)	13 (72.2)	4 (22.2)	
Yes				
The contribution of community pharmacist could guarantee the basic medical needs of the diabetic patient?				
Strongly agree	3 (2.9)	91 (87.5)	10 (9.6)	0.152
Agree	2 (1.5)	108 (78.8)	27 (19.7)	
Disagree	0 (0)	11 (100)	0 (0)	
Strongly agree	0 (0)	1 (50)	1 (50.0)	
The patient counselling regarding the medicines could reduce the medication side effects				
Strongly agree	3 (3.0)	84 (83.2)	14 (13.9)	0.786
Agree	2 (1.5)	113 (84.3)	19 (14.2)	
Disagree	0 (0)	12 (75.0)	4 (25.0)	
Strongly disagree	0 (0)	2 (66.7)	1 (33.3)	

Pharmacists working in primary settings strongly agree that counselling patients about their medications can reduce side effects more effectively than those in secondary settings (p=0.031). Pharmacists with a bachelor's qualification counsel more patients per day compared to those with a diploma, master's, or doctorate qualification (p=0.00). Additionally, pharmacists with bachelor's degrees believe that ongoing screening for nephropathy, retinopathy, and neuropathy is essential, and this is statistically significant (p=<0.05). Junior pharmacists (1-4 years of experience) are significantly more likely to counsel patients daily compared to those with more experience (p=0.029).

Community pharmacists' suggestions on common concerns, ways to improve patient knowledge, components of counselling, and barriers across gender, education status, practice site, and years of experience were reported in Tables 6 and 7. When examining gender, the highest responses were obtained from female pharmacists. Approximately two-thirds of female pharmacists provided suggestions on common concerns, ways to improve patients' knowledge, components of counselling, and barriers in counselling. Among female pharmacists, almost 70% reported that the common concerns of diabetic patients were nephropathy and a diabetic diet.

The pharmacists believe that raising patients' awareness of diabetes treatment through nutrition and self-monitoring of blood glucose (SMBG) is crucial. Additionally, they are offering more frequent counselling on medication and diet compliance [19]. Most of the responses obtained from pharmacists are from those with bachelor's qualifications, working in primary care settings, and having 1-4 years of experience.

Table 6: A descriptive Analysis of Pharmacists' Responses based on their Level of Education (n=254).

Question	Frequency n (%)	Diploma n (%)	Bachelor n (%)	Master n (%)
What are the common **concerns** of diabetic patients visiting to your pharmacy				
Side effect	59 (23.2)	2 (3.4)	48 (81.4)	9 (15.3)
Uncontrolled blood glucose	155 (61.0)	5 (3.2)	127 (81.9)	23 (14.8)
Wound foot	24 (9.4)	1 (4.2)	19 (79.2)	4 (16.7)
Neuropathy	35 (13.8)	1 (2.9)	31 (88.6)	3 (8.6)
Retinopathy	248 (97.6)	4 (1.6)	206 (83.1)	38 (15.3)
Nephropathy	246 (96.9)	5 (2.0)	203 (82.5)	38 (15.4)
Complication	28 (11.0)	-	25 (89.3)	3 (10.7)
Unsure	51 (20.1)	-	44 (86.3)	7 (13.7)
Diabetic diet	47 (18.5)	1 (2.1)	35 (74.5)	11 (23.4)
As a priority which component is the most important to improve patient knowledge about the diabetes management				
Diet	129 (50.8)	4 (3.1)	108 (83.7)	17 (13.2)
Compliance	113 (44.5)	4 (3.5)	91 (80.5)	18 (15.9)
Exercise	47 (18.5)	3 (6.4)	39 (83.5)	5 (10.6)
Counselling	48 (18.9)	-	39 (81.3)	9 (18.8)
Disease education	78 (30.7)	-	68 (87.2)	10 (12.8)
Others SMBG	34 (13.4)	-	29 (85.3)	5 (14.7)
Which type of above-mentioned components you counsel most of the time in diabetic patients				
Compliance	99 (39.0)	2 (2.0)	81 (81.8)	16 (16.2)
Diet	138 (54.3)	3 (2.2)	112 (81.2)	23 (16.7)
Exercise	43 (16.9)	3 (7.0)	35 (81.4)	5 (11.6)
Counselling	53 (20.9)	1 (1.9)	46 (86.8)	6 (11.3)
Others	50 (19.7)	-	44 (88.0)	6 (12.0)
What are the various barriers involved in the process of health education services				
Non-compliance	33 (13.0)	1 (3.0)	24 (72.7)	8 (24.2)
Ignorant	88 (34.6)	2 (2.3)	75 (85.2)	11 (12.5)
Language barrier	56 (22.0)		48 (85.7)	8 (14.3)
Time	88 (34.6)	82 (93.2)		6 (6.8)
Literacy	56 (22.0)	2 (3.6)	46 (82.1)	8 (14.3)
Cost of counselling	239 (94.1)	4 (1.7)	200 (83.7)	35 (14.6)
Diabetic diet-related services, and experience with the side effects of medications	246 (96.9)	5 (2.0)	205 (83.3)	36 (14.6)

Table 7: A Descriptive Analysis of Pharmacists' Responses by Practice Site (n=254).

Question	Frequency n (%)	Primary n (%)	Secondary n (%)
What are the common concerns of diabetic patients visiting to your pharmacy			
Side effect	59 (23.2)	53 (89.8)	6 (10.2)
Uncontrolled blood glucose	155 (61.0)	128 (82.6)	27 (17.4)
Wound foot	24 (9.4)	17 (70.8)	7 (29.2)
Neuropathy	35 (13.8)	29 (82.9)	6 (17.1)
Retinopathy	248 (97.6)	211 (85.1)	37 (14.9)
Nephropathy	246 (96.9)	210 (85.4)	36 (14.6)
Complication	28 (11.0)	24 (85.7)	4 (14.3)
Unsure	51 (20.1)	44 (86.3)	7 (13.7)
Diabetic diet	47 (18.5)	43 (91.5)	4 (8.5)
As a priority which component is the most important to improve patient knowledge about the diabetes management			
Diet	129 (50.8)	106 (82.2)	23 (17.8)
Compliance	113 (44.5)	93 (82.3)	20 (17.7)
Exercise	47 (18.5)	42 (89.4)	5 (10.6)
Counselling	48 (18.9)	43 (89.6)	5 (10.4)
Disease education	78 (30.7)	72 (92.3)	6 (7.7)
Others SMBG	34 (13.4)	31 (91.2)	3 (8.8)
Which type of above-mentioned components you counsel most of the time in diabetic patients			
Compliance	99 (39.0)	80 (80.8)	19 (19.2)
Diet	138 (54.3)	111 (80.4)	27 (19.6)
Exercise	43 (16.9)	36 (83.7)	7 (16.3)
Counselling	53 (20.9)	50 (94.3)	3 (5.7)
Others	50 (19.7)	43 (86.0)	7 (14.0)
What are the various barriers involved in the process of health education services			
Non-compliance	33 (13.0)	27 (81.8)	6 (18.2)
Ignorant	88 (34.6)	72 (81.8)	16 (18.2)
Language barrier	56 (22.0)	49 (87.5)	7 (12.5)
Time	88 (34.6)	75 (85.2)	13 (14.8)
Literacy	56 (22.0)	45 (80.4)	11 (19.6)
Cost of counselling	239 (94.1)	200 (83.7)	39 (16.3)
Diabetic diet-related services, and experience with the side effects of medications	246 (96.9)	210 (85.4)	36 (14.6)

Pharmacists with bachelor's degrees reported that over 80% of their typical concerns revolved around strategies to enhance patient awareness, common elements of counselling, and challenges in managing diabetic symptoms. They were able to address nearly 90% of common worries among diabetic patients regarding complications and neuropathy. Furthermore, they strongly recommended (87.3%) providing disease education to patients as a means of enhancing their understanding. The barriers they encountered included patients' lack of knowledge and language barriers. Additional information can be found in Tables 6 and 7.

4. Discussion

In Malaysia, community pharmacies are recognized for their traditional role in dispensing medication, but many also provide additional services. One common practice is offering medication education, including instructions for use. Research from developed countries shows that community pharmacists often counsel patients on various aspects of their medications, such as proper administration, lifestyle changes, self-monitoring of blood glucose, and medication adherence, which is consistent with the findings of this study [20-23]. However, it was observed that educating patients on smoking cessation was less common in this study compared to studies conducted in Western countries [20, 21].

Patients in developed countries received specialized education on SMBG; however, this was lacking among some of the pharmacists in the present study. This may be due to a lack of knowledge, skills, or access to further training programs needed to provide patients with counselling on smoking cessation and SMBG. The findings of this study align with those of other research studies [23-25], such as monitoring services, involvement in treatment outcomes, and treatment planning were reported as less common practices in this study population.

The professional role of community pharmacists in the current study settings is consistent with other studies conducted in developed nations like the USA and Canada. In these countries, community pharmacists provide medication management, preventive care services for diabetes, asthma, and hypertension, as well as monitor serious diseases and offer lifestyle counselling [26-29]. The adoption of well-established skills and knowledge-based services is crucial in diabetes management and requires further improvement.

The present study revealed that the most frequently counselled components for diabetic patients by community pharmacies were diabetic diet, weight control, exercise, symptoms, treatment of hypoglycemia, neuropathy, retinopathy, nephropathy, and foot care. Most patients tend to seek advice on basic precautions to prevent the worsening of their condition. This indicates that patients are increasingly aware of their health and the importance of maintaining a good quality of life. Additionally, the survey found that most community pharmacists provided counselling on diet management, likely due to the significant increase in obesity prevalence over the last four decades, with obesity rates rising to 15.6% in Malaysia.

Incorporating community pharmacies into national and international health programs is a valuable and crucial way to advance public health in the country. Therefore, understanding the barriers involved in implementing such services is key to the merging process of community pharmacy and public health. In the present study, the most identified barriers in providing health education services were the cost of counselling, services related to diabetic diets, and patients' past experiences with medication side effects. It is worth noting that Malaysian government hospitals often provide medication for diabetes management free of charge, which assists patients facing financial difficulties in obtaining their medication from community pharmacists.

The study revealed that few patients do not recognize or comprehend the tasks and obligations of community pharmacy experts, and even fewer patients do not cooperate by providing background information about their disease condition. It was evident that some patients tend to ignore the advice and decisions provided by community pharmacists. Findings from both developed and developing countries have shown that training programs are crucial for improving the abilities of community pharmacy professionals. This includes improving their self-confidence when providing public health services and engaging in educational intervention programs to increase public awareness of community pharmacists' roles and responsibilities [27, 30].

5. Limitations

Since the study was conducted in a specific area of the Klang Valley in Malaysia, the findings may not be applicable to the entire community of Malaysian pharmacists. Additionally, because the study relied on self-administered questionnaires, there is a possibility of recall bias.

6. Conclusion

The present study demonstrates that the diabetic health education services provided by community pharmacist professionals are particularly effective in promoting lifestyle modifications to manage diabetes. The most common barriers identified by community pharmacists in providing patient education services were the cost of counselling, diabetic diet-related services, and patients' past experiences with medication side effects. Additionally, training and ongoing education programs are necessary to improve and maintain the community pharmacist's role in diabetes management.

Acknowledgments

We would like to express our gratitude to the management of IMU University for their essential support in conducting this research.

Funding

This study was funded by the IMU University, Kuala Lumpur, Malaysia, the grant approval number is MPP I-2018-08.

Declarations

The proposal, with Project ID: MPP I-2018-08, was approved by the Joint Committee on Research and Ethics of IMU University (IMU-JC). The anonymity and confidentiality of the data were respected and maintained throughout the study.

Competing Interests

The authors declare that they have no competing interests.

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