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COMMUNITY PHARMACISTS' PERCEPTION AND EXPERIENCE IN PROVIDING LIFESTYLE ASSISTANCE TO PATIENTS WITH CARDIOVASCULAR DISEASE

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ABSTRACT: Background: Cardiovascular disease (CVD) is the leading cause of death worldwide. Management of behavioral risk factors is recommended for primary and secondary prevention of CVDs. There is evidence that the involvement of community pharmacies in health promotion activities is successful. **Objectives:** This study was conducted to assess community pharmacists' perception and current practice in providing lifestyle assistance to patients with cardiovascular disease and to identify potential barriers to the provision of lifestyle assistance in Klang Valley, Malaysia. **Method:** A cross-sectional study was conducted among community pharmacists in Klang Valley using convenience sampling. A self-administered 54-item questionnaire was used to collect information on the current practice and perception of community pharmacists, and potential barriers in providing lifestyle assistance to patients with cardiovascular disease. **Results:** The response rate was 62.8%. Most of the services investigated were available in the pharmacy except for advice on alcohol consumption (52.7%) and screening and/or monitoring services for obesity (57.7%), which are less likely to be available. For most of the listed activities in relation to the provision of lifestyle assistance to patients with cardiovascular disease, the majority of the pharmacists responded that they did it "sometimes" or "most of the time". Over 75% of the pharmacists responded with "agree to strongly agree" for most of the statements on perception towards the provision of lifestyle assistance to patients with the cardiovascular disease while $\geq 80\%$ of the pharmacists identified lack of time/heavy workload and lack of staff as the main potential barriers in the provision of lifestyle assistance. **Conclusion:** Community pharmacists in Klang Valley provide lifestyle assistance to patients with cardiovascular disease to some extent and have a positive perception towards the provision of lifestyle assistance. However, their involvement may be limited due to multiple barriers

INTRODUCTION: Cardiovascular disease (CVD) is the leading cause of death worldwide, especially in low- and middle-income countries.

The World Health Organization (WHO) reported that in 2012, an estimated 17.5 million people died from CVDs, which correspond to 31% of all global deaths¹. The Malaysian Ministry of Health (MOH) reported that mortality due to CVDs in Malaysian hospitals increased from 15.7% in 1996 to 25.4% in 2006^{2,3}.

A number of risk factors for CVDs have been identified, including behavioral factors such as unhealthy diet, physical inactivity, excess weight,

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tobacco use, and alcohol consumption¹. Dietary changes, physical activity, weight control, smoking cessation, and reduced alcohol consumption are among the WHO recommendations for primary and secondary prevention of CVDs⁴. Management of behavioral risk factors is also advocated by health authorities and integrated into clinical practice guidelines for secondary prevention of CVDs⁵.

Among community pharmacists worldwide, there is an increasing interest in expanding their role in public health in addition to their existing role of dispensing and supplying medications^{6, 7}. Community pharmacies are an ideal setting for providing public health services as they are easily accessible, convenient, and widely distributed⁸. Previous studies have shown the positive impact of community pharmacy-based services on a range of public health issues, including CVD prevention and management^{9, 10}. However, many studies have reported various levels of involvement and perception among community pharmacists towards public health. The extent of pharmacists' contribution is influenced by the perception of their scope of practice. Although community pharmacists believed that they have a significant role to play in health promotion, they highlighted that there were some challenges^{6, 8, 11, 12}.

Numerous barriers to the provision of public health services in community pharmacies have been identified. These include lack of remuneration, lack of time, lack of training as well as lack of knowledge and confidence, among others. Lack of recognition of this role for pharmacists and lack of collaboration with other healthcare professionals also contribute to the low involvement of community pharmacists in public health services^{7, 11, 12}. Some strategies that have been proposed to overcome these barriers include remuneration, training, integration of behavioral risk factor management in regular pharmaceutical practice, and increasing public awareness of the role of community pharmacies in health promotion^{8, 11}. In 2005, the United Kingdom's National Health Service incorporated pharmacists into their public health program, thereby encouraging and providing opportunities for pharmacists to practice their role in health promotion and prevention¹³.

To date, there are limited studies exploring the perception and experience of community

pharmacists in providing lifestyle assistance to patients with cardiovascular disease in Malaysia. Therefore, the purpose of this study is to assess the perception and experience of community pharmacists in providing lifestyle assistance to patients with cardiovascular disease in a Malaysian setting.

OBJECTIVES: The objectives of this study were as follows: (1) To assess the perception of community pharmacists towards providing lifestyle assistance to patients with cardiovascular disease; (2) to assess the current practice of community pharmacists in providing lifestyle assistance to patients with cardiovascular disease; and (3) to identify potential barriers in providing lifestyle assistance to patients with cardiovascular disease.

METHODS: A cross-sectional survey was conducted among community pharmacists in Klang Valley, Malaysia, from 17th March 2016 to 16th June 2016. Ethical approval was obtained from the Research Ethics Committee of Universiti Kebangsaan Malaysia Medical Centre (UKM 1.5.3.5/244/JEP-2016-120).

Sample Selection Criteria: The inclusion criteria in this study were: (1) community pharmacist. These pharmacists were excluded: (1) those who refused to answer a survey, or sent incomplete survey responses; (2) those working in companies where company policy did not allow the pharmacists to answer the survey.

Sample Size: The sample size was determined using the Li Wan Po (1998) formula. With a 95% confidence interval and a margin of error of 5%, the sample size for this study was calculated to be 290 pharmacists.

Study Tool: A self-administered 54-item questionnaire was used to assess the perception and experience of community pharmacists in providing lifestyle assistance to patients with cardiovascular disease. The questionnaire consists of four sections and collected information on the following: (1) demographic characteristics of respondents (section A); (2) current practice (experience) of community pharmacists in providing lifestyle assistance to patients with cardiovascular disease (section B); (3) perception of community pharmacists towards providing lifestyle assistance to patients with

cardiovascular disease (section C); and (4) potential barriers in providing lifestyle assistance to patients with cardiovascular disease (section D).

Current practice (experience) of community pharmacists in providing lifestyle assistance to patients with cardiovascular disease was measured by: (1) listing 8 services that can be provided at the pharmacy and respondents were asked to indicate (yes/ no) which of the listed services were provided at their pharmacy; (2) listing 12 activities that can be provided at the pharmacy and respondents were asked to indicate on a 5-point Likert scale (never, rarely, sometimes, most of the time, always) on how often do they provide the activities listed. The respondents were also asked to indicate the average time devoted to offering counseling, advice or screening/ monitoring services pertaining to lifestyle assistance.

Perception of community pharmacists towards providing lifestyle assistance to patients with cardiovascular disease was measured by listing 8 statements on attitudes and beliefs towards the provision of lifestyle assistance, and respondents were asked to indicate on a 5-point Likert scale (strongly disagree, disagree, neutral, agree, strongly agree) their level of agreement with each statement.

Potential barriers in providing lifestyle assistance to patients with cardiovascular disease were measured by listing 14 barriers that may limit pharmacists' participation in the provision of lifestyle assistance and respondents were asked to indicate on a 5-point Likert scale (strongly disagree, disagree, neutral, agree, strongly agree) their opinion on each barrier. The respondents were also asked to indicate which strategies would facilitate community pharmacists in the provision of lifestyle assistance to patients with cardiovascular disease.

The questionnaire was designed to address the objectives of the study based on existing literature on the research topic. It was reviewed for content and design validity among 5 academics with experience in conducting research in pharmacy practice. The validity and reliability of the questionnaire were tested in a pilot study among 25 community pharmacists using Cronbach's alpha. The alpha values obtained for Section B (Question 11 and 12), Section C (Question 14 and 15) and

Section D (Question 16) were 0.660, 0.843 and 0.753 respectively. No changes were made to the study tool based on the pilot study findings.

Data Collection: Convenience sampling was used in the selection process of community pharmacists. A self-administered questionnaire was distributed either personally by hand or by email (using Google Forms) to respondents who met the inclusion and exclusion criteria. On approaching a pharmacy, the purpose of the study was briefly explained to the community pharmacist on duty. Those who agreed to take part in the study were given a copy of the questionnaire together with an information sheet. The completed questionnaires were then collected within one week, together with written consent as an ethical requirement.

The questionnaire and an information sheet were also emailed to the license holder of community pharmacies in Klang Valley using a web-based survey provider, Google Forms. A list of email addresses of license holders of community pharmacies was obtained from the Pharmaceutical Services Division, Ministry of Health Malaysia. A reminder email was sent 2 weeks after the initial emailing. Pharmacists who participated and completed the questionnaire using Google Forms were considered to have given their consent.

Data Analysis: For data analysis, Statistical Package for Social Sciences (SPSS) version 23 was used. Responses were analyzed descriptively and presented as frequency, percentage, mean, and standard deviation. Chi-square test, Kruskal-Wallis test, and linear regression were used to analyze the association between demographic characteristics and binary/ ordinal responses. A p-value of less than 0.05 was considered statistically significant.

RESULTS:

Sample Characteristics: A total of 182 community pharmacists participated in the study (response rate of 62.8%). The demographic characteristics of the respondents are summarized in **Table 1**. The majority of the respondents were female (61.5%), aged between 25 and 34 years old (61.5%), and had 1 to 3 years of experience as a community pharmacist (32.4%). Most of the respondents had a bachelor's degree (89.6%) as their highest qualification and had graduated from a

Malaysian university (46.2%). The majority of the respondents were salaried (79.7%), working full time (81.9%), and from chain pharmacies (57.1%).

TABLE 1: DEMOGRAPHIC CHARACTERISTICS OF RESPONDENTS (N = 182)

Characteristics	No. Respondents	Percentage (%)
Gender		
Male	70	38.5
Female	112	61.5
Age (years)		
18 – 24	3	1.6
25 – 34	112	61.5
35 – 44	39	21.4
45 – 54	18	9.9
55 – 64	10	5.5
Years of experience as a community pharmacist (year)	8	4.4
< 1		
1 – 3	59	32.4
4 – 6	43	23.6
7 – 10	21	11.5
> 10	51	28.0
Highest qualification		
Graduate (First degree)	163	89.6
Postgraduate (Master/ PhD)	19	10.4
University graduated from		
Malaysian university	84	46.2
Abroad	42	23.1
Twinning program	56	30.8
Position		
Proprietor	37	20.3
Salaried	145	79.7
Employment status		
Full time	149	81.9
Part time	33	18.1
Average working hours per week (hours)		
< 25	25	13.7
25 – 48	157	86.3
Type of pharmacy		
Multiple (> 200 outlets)	10	5.5
Chain (> 5, < 200 outlets)	104	57.1
Independent (\leq 5 outlets)	68	37.4
Characteristics of most prevalent patients at the pharmacy	52	28.6
Adult (18 – 49 years)		
Older adult (50 – 65 years)	33	18.1
Elderly (> 65 years)	1	0.5
Families	8	4.4
All ages	88	48.4

Current Practice (Experience) of Community Pharmacists in Providing Lifestyle Assistance to Patients with Cardiovascular Disease: Table 2 shows the availability and frequency of services provided at the respondents' pharmacy. The top 3 services that were provided are screening and/or monitoring for hypertension (98.4%) and diabetes (97.8%), and advice on weight management

(94.5%). However, services such as advice on alcohol consumption (52.7%) and screening and/or monitoring for obesity (57.7%) were less likely to be available. Screening and/or monitoring for hypertension (mean \pm SD, 4.46 ± 0.733), and diabetes (mean, 4.38 ± 0.797), and giving advice on healthy diet and exercise (mean, 4.16 ± 0.818) are the top 3 most frequent services provided by community pharmacists. On the other hand, giving advice on alcohol consumption is the least frequent service provided (mean, 2.92 ± 1.087).

Based on the Kruskal-Wallis test, there was a statistically significant difference in the frequency of providing screening and/or monitoring services for dyslipidemia between different types of pharmacies ($p = 0.007$). Besides that, statistically significant differences were observed in the frequency of giving advice on smoking cessation ($p = 0.041$), healthy diet and exercise ($p = 0.028$), and alcohol consumption ($p = 0.040$) between different positions of a pharmacist. Employment status of a pharmacist was found to have a significant effect on the frequency of giving advice on healthy diet and exercise ($p < 0.001$), alcohol consumption ($p = 0.019$) and weight management ($p = 0.005$), providing screening and/or monitoring services for obesity ($p = 0.007$), and keeping records of pharmaceutical care services ($p = 0.002$). For more details, refer to Table 3. The majority of the pharmacists in this study (51.6%) spent an average of 5 to 10 minutes on counseling, advice or screening and/or monitoring services pertaining to lifestyle assistance for one patient.

Perception of Community Pharmacists towards Providing Lifestyle Assistance to Patients with Cardiovascular Disease: The pharmacists' responses on perceptions towards providing lifestyle assistance to patients with cardiovascular disease are presented in Table 4. Over 75% of the pharmacists responded with "agree to strongly agree" for most of the statements on attitudes and beliefs towards the provision of lifestyle assistance to patients with cardiovascular disease. However, the pharmacists have the lowest perception of the ability to identify patients at risk of cardiovascular disease (mean, 3.92 ± 0.776) and capability to influence the patient to adopt a healthy lifestyle (mean, 3.84 ± 0.732).

TABLE 2: RESPONSES ON AVAILABILITY AND FREQUENCY OF SERVICES PROVIDED AT THE COMMUNITY PHARMACY

Activity/ Service	No. Respondents (%) Yes	Frequency Scale (Mean ± SD)*
Advice on smoking cessation/ smoking cessation program	144 (79.1)	3.19 ± 1.020
Advice on healthy diet and exercise	171 (94.0)	4.16 ± 0.818
Advice on alcohol consumption	96 (52.7)	2.92 ± 1.087
Advice on weight management	172 (94.5)	3.76 ± 0.960
Screening and/or monitoring for hypertension (blood pressure)	179 (98.4)	4.46 ± 0.733
Screening and/or monitoring for diabetes (blood glucose)	178 (97.8)	4.38 ± 0.797
Screening and/or monitoring for dyslipidemia (cholesterol)	155 (85.2)	3.86 ± 1.231
Screening and/or monitoring for obesity (body mass index, waist circumference)	105 (57.7)	3.16 ± 1.178
Provision of a self-monitoring device	NM	3.97 ± 0.957
Referral to a physician and/or allied healthcare professional if required	NM	4.01 ± 0.946
Provide written information/ educational materials	NM	3.33 ± 1.041
Keeping records of pharmaceutical care services	NM	3.10 ± 1.168

* Measured on a 5-point Likert scale: 1, Never; 2, Rarely; 3, Sometimes; 4, Most of the time; 5, Always
SD = Standard deviation; NA = Not measured

TABLE 3: ASSOCIATION BETWEEN FREQUENCY OF SERVICES PROVIDED AT THE COMMUNITY PHARMACY WITH TYPE OF PHARMACY, POSITION AND EMPLOYMENT STATUS

Activity	Parameter			Kruskal-Wallis p-value ^b
	Type of Pharmacy			
	Multiple (Mean ± SD) ^a	Chain (Mean ± SD) ^a	Independent (Mean ± SD) ^a	
Screening and/or monitoring for dyslipidemia (cholesterol)	2.80 ± 1.549	3.76 ± 1.242	4.16 ± 1.060	0.007*
	Position			
	Proprietor (Mean ± SD) ^a	Salaried (Mean ± SD) ^a		
Advice on smoking cessation/ smoking cessation program	3.49 ± 0.932	3.12 ± 1.031		0.041*
Advice on healthy diet and exercise	4.43 ± 0.689	4.10 ± 0.836		0.028*
Advice on alcohol consumption	3.19 ± 0.995	2.85 ± 1.101		0.040*
	Employment Status			
	Full Time (Mean ± SD) ^a	Part-Time (Mean ± SD) ^a		
Advice on healthy diet and exercise	4.28 ± 0.752	3.67 ± 0.924		< 0.001*
Advice on alcohol consumption	3.01 ± 1.124	2.52 ± 0.795		0.019*
Advice on weight management	3.87 ± 0.898	3.30 ± 1.104		0.005*
Screening and/or monitoring for obesity (body mass index, waist circumference)	3.28 ± 1.132	2.67 ± 1.267		0.007*
Keeping records of pharmaceutical care services	3.23 ± 1.140	2.55 ± 1.148		0.002*

^a Measured on a 5-point Likert scale: 1, Never; 2, Rarely; 3, Sometimes; 4, Most of the time; 5, Always

^b p-value < 0.05 is considered statistically significant (*), SD = Standard deviation

TABLE 4: RESPONSES ON PERCEPTION OF COMMUNITY PHARMACISTS TOWARDS PROVIDING LIFESTYLE ASSISTANCE TO PATIENTS WITH CARDIOVASCULAR DISEASE

Statement	Agreement Scale (Mean ± SD)*
Willingness to provide lifestyle assistance to cardiovascular patients	4.41 ± 0.665
Ability to identify patients at risk of cardiovascular disease	3.92 ± 0.776
Confidence/ comfortability to provide advice to patients regarding lifestyle modification	4.25 ± 0.624
Capability to influence patients to adopt a healthy lifestyle	3.84 ± 0.732
Belief that provision of lifestyle assistance is effective in reducing the risk of cardiovascular events	4.46 ± 0.609
Community pharmacy is an ideal setting to provide lifestyle assistance to patients with cardiovascular disease	4.35 ± 0.661
Community pharmacists have sufficient knowledge of cardiovascular disease and its management to offer support to a patient	4.03 ± 0.765
Health promotion in the prevention and management of the cardiovascular disease should be made compulsory in the community pharmacy practice	4.05 ± 0.852

* Measured on a 5-point Likert scale: 1, Strongly disagree; 2, Disagree; 3, Neutral; 4, Agree; 5, Strongly agree
SD = Standard deviation

Based on the Kruskal-Wallis test, pharmacists' perception towards providing lifestyle assistance to patients with cardiovascular disease was significantly affected by the type of pharmacy, highest qualification, position in the pharmacy, and employment status. However, there were no significant differences between years of experience as a community pharmacist or university graduate from and perception towards providing lifestyle assistance. To further explore the association of these independent variables to perception towards

the provision of lifestyle assistance, linear regression was applied in **Table 5**. The regression analysis revealed that type of pharmacy, specifically multiple pharmacies, was negatively associated with the ability to identify patients at risk of cardiovascular disease (OR 0.238, 95% CI 0.319 – 1.298; $p = 0.001$) and that health promotion in the prevention and management of the cardiovascular disease should be made compulsory in the community pharmacy practice (OR 0.259, 95% CI 0.429 - 1.505; $p < 0.001$).

TABLE 5: INDEPENDENT CORRELATES OF PERCEPTION TOWARDS PROVIDING LIFESTYLE ASSISTANCE TO PATIENTS WITH CARDIOVASCULAR DISEASE & ASSESSMENT OF POTENTIAL BARRIERS IN PROVIDING LIFESTYLE ASSISTANCE TO PATIENTS WITH CARDIOVASCULAR DISEASE

Statement	Independent Correlate	Odds Ratio (95% Confidence Interval) ^a , p-value ^b
Perception of Providing Lifestyle Assistance to Patients with Cardiovascular Disease		
Ability to identify patients at risk of cardiovascular disease	Type of pharmacy	
	Multiple (> 200 outlets)	0.238 (0.319 – 1.298), $p = 0.001^*$
	Chain (> 5, < 200 outlets)	Excluded
Health promotion in the prevention and management of the cardiovascular disease should be made compulsory in the community pharmacy practice	Independent (≤ 5 outlets)	-0.044 (-0.302 – 0.162), $p = 0.553$
	Type of pharmacy	
	Multiple (> 200 outlets)	0.259 (0.429 – 1.505), $p < 0.001^*$
	Chain (> 5, < 200 outlets)	Excluded
	Independent (≤ 5 outlets)	-0.062 (-0.363 – 0.144), $p = 0.396$
Assessment of Potential Barriers in Providing Lifestyle Assistance to Patients with Cardiovascular Disease		
Lack of educational materials on cardiovascular prevention	Employment status	
	Full time	Ref
Concern regarding patients' acceptance	Part-time	0.196 (0.133 – 0.880), $p = 0.008^*$
	Highest qualification	
Lack of recognition for this role by patients	Graduate (First degree)	Ref
	Postgraduate (Master/PhD)	0.161 (0.050 – 0.940), $p = 0.030^*$
Lack of patients' interest and motivation to engage in any additional support offered by pharmacist	Employment status	
	Full time	Ref
Difficulty to deliver as there is no core of regular patients	Part-time	0.213 (0.187 – 0.960), $p = 0.004^*$
	Employment status	
Not viewed as part of pharmacists' role from pharmacists' perspective	Full time	Ref
	Part-time	0.191 (0.112 – 0.813), $p = 0.010^*$
Lack of incentive from management	Employment status	
	Full time	Ref
	Part-time	0.230 (0.227 – 0.978), $p = 0.002^*$
	Years of experience as a community pharmacist	
	< 1 year	0.026 (-0.538 – 0.768), $p = 0.729$
	1 – 3 years	Excluded
	4 – 6 years	0.119 (-0.095 – 0.609), $p = 0.151$
	7 – 10 years	-0.004 (-0.458 – 0.436), $p = 0.961$
	> 10 years	0.310 (0.298 – 0.964), $p < 0.001^*$
	University graduated from	
	Malaysian university	Excluded
	Abroad	0.144 (-0.024 – 0.651), $p = 0.069$
	Twinning program	0.209 (0.109 – 0.720), $p = 0.008^*$
	Highest qualification	
	Graduate (First degree)	Ref
	Postgraduate (Master/PhD)	0.182 (0.132 – 1.229), $p = 0.015^*$

^a Obtained from linear regression analysis. Dependent variables are measured on a 5-point Likert scale: 1, Strongly disagree; 2, Disagree; 3, Neutral; 4, Agree; 5, Strongly agree. ^b p-value < 0.05 is considered statistically significant (*). Ref = Reference group; p = p-value

Potential Barriers in Providing Lifestyle Assistance to Patients with Cardiovascular Disease: Table 6 shows the potential barriers in providing lifestyle assistance to patients with cardiovascular disease at the respondents' pharmacy and their level of agreement with each item. The top 3 potential barriers to the provision of lifestyle assistance to patients with cardiovascular

disease at the pharmacy were lack of time/ heavy workload (mean, 4.13 ± 0.797), lack of staff (mean, 4.02 ± 0.800) and lack of collaborative relationship/ communication with other healthcare professionals (mean, 3.76 ± 0.979). It is noteworthy that the pharmacists ranked "Not viewed as part of pharmacist's role" (mean, 2.37 ± 0.917) as the lowest potential barrier.

TABLE 6: RESPONSES ON ASSESSMENT OF POTENTIAL BARRIERS IN PROVIDING LIFESTYLE ASSISTANCE TO PATIENTS WITH CARDIOVASCULAR DISEASE

Barriers	Agreement Scale (Mean \pm SD)*
Lack of time/ heavy workload	4.13 ± 0.797
Lack of staff	4.02 ± 0.800
Lack of space/ private counseling area	3.59 ± 1.072
Lack of educational materials on cardiovascular prevention	3.62 ± 1.000
Lack of confidence due to lack of skill/ training about cardiovascular disease	2.95 ± 1.001
Concern regarding patient's acceptance (seen as a judgmental, negative reaction, damage relationship)	2.98 ± 0.940
Lack of recognition for this role by patients	3.32 ± 1.039
Lack of patients' interest and motivation to engage in any additional support offered by pharmacist	3.44 ± 0.937
Difficulty to deliver as there is no core of regular patients	3.02 ± 1.013
Pharmacists' perceived effectiveness of the provision of lifestyle assistance in reducing the risk of cardiovascular events	3.27 ± 0.893
Not viewed as part of pharmacists' role from pharmacists' perspective	2.37 ± 0.917
Pharmacists' belief that patients are aware of the direct association between lifestyle behaviors and poor health	3.29 ± 0.889
Lack of collaborative relationship/ communication with other healthcare professionals	3.76 ± 0.979
Lack of incentive from management	3.30 ± 1.148

* Measured on a 5-point Likert scale: 1, Strongly disagree; 2, Disagree; 3, Neutral; 4, Agree; 5, Strongly agree, SD = Standard deviation

Based on the Kruskal-Wallis test, it was found that pharmacists' assessment of potential barriers in providing lifestyle assistance to patients with cardiovascular disease was significantly affected by years of experience as a community pharmacist, university graduated from, highest qualification, and employment status. However, there were no significant differences between the type of pharmacy or position in the pharmacy and the assessment of potential barriers in providing lifestyle assistance. To further explore the association of these independent variables to the assessment of potential barriers in providing lifestyle assistance, linear regression was applied in **Table 5**.

The regression analysis revealed that part-time pharmacist was negatively associated with assessment of barriers such as lack of educational materials on cardiovascular prevention (OR 0.196, 95% CI 0.133 – 0.880; $p = 0.008$), lack of recognition for this role by patients (OR 0.213, 95% CI 0.187 – 0.960; $p = 0.004$), lack of patients'

interest and motivation to engage in any additional support offered by pharmacist (OR 0.191, 95% CI 0.112 – 0.813; $p = 0.010$), and difficulty to deliver as there is no core of regular patients (OR 0.230, 95% CI 0.227 – 0.978; $p = 0.002$) when compared to full time pharmacist. The analysis also showed that postgraduate pharmacist was negatively associated with the assessment of barriers such as concern regarding patients' acceptance (OR 0.161, 95% CI 0.050 – 0.940; $p = 0.030$) and lack of incentive from management (OR 0.182, 95% CI 0.132 – 1.229; $p = 0.015$) when compared to the graduate pharmacist. In addition, there was a strong association between years of experience as a community pharmacist, specifically more than 10 years, and assessment of the barrier "Not viewed as part of pharmacists' role" (OR 0.310, 95% CI 0.298 – 0.964; $p < 0.001$). The university graduated from, specifically, the twinning program was found to have an association with the assessment of the barrier "Not viewed as part of pharmacists' role" (OR 0.209, 95% CI 0.109 – 0.720; $p = 0.008$).

Majority of the respondents ranked the following as the top 3 strategies that can facilitate community pharmacists in the provision of lifestyle assistance to patients with cardiovascular disease: training and credentialing (90.1%), increased public awareness of the role of community pharmacists in health promotion (85.2%) and development of public health programs in community pharmacy (82.4%). Other strategies that were suggested include referral from physicians and partnerships with cardiologists in the treatment plan of patients with cardiovascular disease.

DISCUSSION: To the best of our knowledge, this is the first study of its kind to be conducted in Klang Valley, Malaysia. The present results revealed that most of the listed services in relation to the provision of lifestyle assistance are available at community pharmacies. Screening and/or monitoring services for hypertension and diabetes, and advice on weight management are the top 3 most available services provided by community pharmacists. This is likely due to the release of the Community Pharmacy Benchmarking Guideline (2nd Edition) by the Pharmaceutical Services Division, Ministry of Health Malaysia. The guideline includes health screening as one of the standard operating procedures and encourages community pharmacists to play a role in health promotion, with emphasis on smoking cessation and weight management¹⁴. On the other hand, advice on alcohol consumption and screening and/or monitoring services for obesity are least likely to be available at the pharmacy.

The study findings showed that the majority of the pharmacists responded with “sometimes to most of the time” for most of the listed activities in relation to the provision of lifestyle assistance. In contrast, a study conducted in the State of Qatar reported that >70% of the pharmacists are rarely or never involved in most of the cardiovascular disease-related health promotion activities². In this present study, screening and/or monitoring for hypertension and diabetes and giving advice on a healthy diet and exercise are the top 3 most frequent services provided by community pharmacists. Similarly, diabetes counseling, as well as nutrition and physical activity counseling, are among the top 5 health promotion activities reported in a study conducted in the State of

Penang². This could indicate increased awareness among the Malaysian public in Klang Valley on the role of community pharmacists in providing services of blood pressure/blood sugar measurements along with interpretation and counseling. It is likely that advice on a healthy diet and exercise are frequently given because diet modification and exercise, besides weight reduction and smoking cessation, are recommended in standard clinical practice guidelines for the management of cardiovascular diseases. On the other hand, giving advice on alcohol consumption and screening and/or monitoring services for obesity are less frequently provided. Similarly, a Kuwaiti study reported that their community pharmacists provide obesity counseling to patients “sometimes to most of the time”². Pharmacists may find it difficult to initiate counseling on sensitive issues regarding alcohol consumption and body weight/waist circumference. This is unfavorable due to rising rates of global obesity³.

Independent pharmacies provide screening and/or monitoring services for dyslipidemia more frequently than chain and multiple pharmacies. This may suggest that independent pharmacies provide a more comprehensive health screening for their patients. Proprietor pharmacists give advice on smoking cessation, healthy diet and exercise, and alcohol consumption more frequently than salaried pharmacists. These findings are similar to that of a study conducted in Quebec, Canada⁷. This is likely because pharmacists working in independent pharmacies and proprietor pharmacists have more control over their daily routine and are willing to spend time on these activities. These pharmacists may also take the opportunity to build a closer relationship with the patients through these activities in an effort to make them as their regular patrons. The results also demonstrated that full-time pharmacists give advice on healthy diet and exercise, alcohol consumption and weight management, provide screening and/or monitoring services for obesity and keep records of pharmaceutical care services more frequently than part-time pharmacists.

Full-time pharmacists are more likely to provide lifestyle assistance because it is within their job scope, and therefore they are obliged to do so. It may also bring greater job satisfaction to their daily

routine. The average time devoted to counseling, advice or screening and/or monitoring services pertaining to lifestyle assistance is 5 to 10 min, which is similar to the findings reported by a study conducted in Quebec, Canada⁶.

In the present study, >75% of the pharmacists responded with “agree to strongly agree” for most of the statements on attitudes and beliefs towards the provision of lifestyle assistance to patients with cardiovascular disease. This suggests that community pharmacists are interested in expanding their role in health promotion beyond their traditional role of dispensing and supplying medications. Similar findings have been reported in a number of studies^{7, 15, 2, 3, 4}. However, the respondents have a lower perception of their ability to identify patients at risk of cardiovascular disease and capability to influence patients to adopt a healthy lifestyle. Mathialagan *et al.*, found that pharmacist’s perceived lack of competency is a barrier for community pharmacists in the delivery of public health services². This could indicate that the pharmacists may not be fully prepared, despite their enthusiasm to expand pharmacists’ role in health promotion. This could be due to lack of a standardized guideline on the provision of health education in community pharmacies, as mentioned by Hassali *et al.*¹⁶ The current community pharmacy benchmarking guideline available locally focuses more on the community pharmacy set-up rather than public health activities specifically.

The study findings demonstrated that pharmacists working in multiple pharmacies have a negative perception of their ability to identify patients at risk of cardiovascular disease. Multiple pharmacies also do not support the idea of making health promotion in the prevention and management of cardiovascular disease compulsory in community pharmacies. This indicates that pharmacists working in independent and chain pharmacies are more receptive to the idea of pharmacists’ role in health promotion. Despite the positive attitudes and beliefs towards the provision of lifestyle assistance to patients with cardiovascular disease, community pharmacists may require support to expand their role in health promotion.

The present results revealed that >80% of the pharmacists identified lack of time/heavy workload

and lack of staff as the main potential barriers in providing lifestyle assistance to patients with cardiovascular disease. These are consistent with findings in previous studies assessing pharmacist involvement in health promotion^{7, 15, 16, 19, 20, 21, 2}. Notably, the pharmacists cited “Not viewed as part of pharmacists’ role” as the lowest potential barrier.

Overall, these findings indicate community pharmacists accept that pharmacists should have a role in health promotion but are deterred by multiple potential barriers.

Community pharmacists with >10 years of experience and those graduating from twinning programs are found to be more receptive to the idea of pharmacists’ role in health promotion. This is likely because universities abroad, such as in the United Kingdom, have incorporated health promotion as part of the education program for undergraduate pharmacy students². Part-time pharmacists are more likely to cite numerous factors as significant barriers to the provision of lifestyle assistance than full-time pharmacists. Part-time pharmacists may be less familiar with the workflow at the pharmacy and have less patient contact due to shorter working hours.

Training and credentialing, increased public awareness of the role of the community pharmacist in health promotion, and development of public health programs in community pharmacies are among the top 3 strategies identified to facilitate pharmacists in the provision of lifestyle assistance to patients with cardiovascular disease. A systematic review of public health in community pharmacies has indicated that training improves pharmacists’ confidence in providing public health services, enabling them to offer these services more proactively². The review also demonstrated that many consumers do not expect pharmacists to offer public health services and had mixed views on pharmacists’ ability to provide these services, which reinforces the need for recognition of this role by the public. The United Kingdom’s National Health Service has integrated community pharmacists into their public health program, providing opportunities for pharmacists to practice their role in health promotion and prevention¹³. It has been suggested that a better delineation between the roles of pharmacists and technicians

would allow pharmacists to have more time on patient-focused care². Another strategy that was proposed is the employment of more pharmacists, which would attract more customers by providing extended services and may be cost-effective at the same time¹⁹. The need to include lifestyle medicine education in the Malaysian pharmacy curriculum has also been highlighted to help train future pharmacists to be competent in the management of lifestyle-related diseases².

This study has some limitations. Firstly, the results of this study cannot be generalized for community pharmacists practicing in a rural area. The findings may also be inappropriate to be generalized for community pharmacists worldwide due to different health systems among countries. Although the data was collected anonymously, there is a possibility of social desirability bias resulting in an overestimation of current practice and perception towards the provision of lifestyle assistance to patients with cardiovascular disease.

CONCLUSION: The current practice of community pharmacists in providing lifestyle assistance to patients with cardiovascular disease is, to some extent, satisfactory except for advice on alcohol consumption and screening and/or monitoring services for obesity. Pharmacists have a positive perception of providing lifestyle assistance to patients with cardiovascular disease. Lack of time/heavy workload and lack of staff were identified as the main potential barriers in the provision of lifestyle assistance to patients with cardiovascular disease, among others.

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