



Barriers and facilitators of wound care services provided by community pharmacists in selangor, malaysia: An exploratory qualitative study

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ABSTRACT

Introduction: Community pharmacists (CPs) are often the first point of contact for patients to obtain health-related advice, including on wound management. Wound care services have been proposed as a community pharmacy practice area to be promoted in Malaysia. **Objectives:** This study aims to explore the types of wound care services provided by Malaysian CPs, and the factors associated with its provision. **Methods:** This study utilized the qualitative method to collect in-depth information about the barriers and facilitators associated with the provision of wound care services among a sample of CPs. Interview transcripts were analyzed using thematic content analysis. **Results:** Twenty-three CPs were recruited. Most of them were female (60.9%) and working at an independent pharmacy (69.6%). All CPs had provided counseling on wound care, and a minority provided wound care services in collaboration with other health-care providers, and first aid services. Barriers for the provision of wound care services among the CPs included the limited knowledge on wound, and the lack of a dedicated area. The perceived benefits of wound care services, and patients' demand are some facilitators identified. **Conclusion:** Professional pharmacy bodies may utilize the findings from this study to develop strategies to further enhance wound care services by CPs.

Keywords: Community pharmacist, Malaysia, qualitative, wound care

INTRODUCTION

Wounds can be categorized as minor or chronic wounds. The former include cuts, scrapes, and abrasions resulting from accidents or physical injuries, while the latter include leg ulcers, diabetic foot ulcers, and pressure ulcers.^[1] Poorly managed wounds can lead to inflammation, infection, and pain, as well as delayed wound-healing processes.^[2]

Community pharmacists (CPs) are highly accessible healthcare providers (HCPs),^[3] so they are often the first point of contact for patients in terms of obtaining health or disease

management advice, including on wound management.^[4] CPs regularly receive patients with minor wounds who mainly wish to obtain wound care products (e.g., gauze, lint, plasters, and bandages) and wound treatment medicines (e.g., topical antibiotics, antiseptics, and analgesics).^[4,5] In fact, a previous survey involving 561 members of the Malaysian public showed that 83.2% of the respondents preferred to obtain wound care products from community pharmacies.^[6]

CPs can provide pharmaceutical care to patients with wounds by helping them select the most suitable wound care products and pharmaceuticals to assist wound healing.^[4] CPs are also responsible for providing patients with education

and counseling to ensure safe use of wound care products. The previous studies conducted in other developing countries showed that CPs have been providing first aid for patients with minor wounds.^[5,7] CPs in Western countries, on the other hand, have been providing extended wound care services by offering wound care consultation and treatment for various types of wounds including lacerations, post-surgical wounds, and skin tears.^[8,9]

In Malaysia, within the initiatives to embrace the paradigm shift in community pharmacy practice from dispensing and an indirect clinical focus to a direct clinical and patient-centered focus,^[10,11] wound care services have been proposed as a community pharmacy practice area to promote.^[12] However, previous studies have shown that CPs encountered many barriers to the provision of wound care services at community pharmacies.^[5,7] Such reported barriers include a lack of adequate knowledge about wound management, a lack of wound-handling skills, and a lack of time and space to provide these services.^[5] The demand for wound care services, the perceived role of CPs in wound care, and their training in this area appear to be facilitators of CPs' provision of wound care services.^[7]

To date, studies pertaining to the provision of wound care services by CPs are still limited.^[5,7] In addition, there is currently a lack of information about the provision of wound care services by CPs in Malaysia, as well as the factors (i.e., facilitators and barriers) associated with it. Given the move to promote wound care services as one of the country's community pharmacy practice areas, the barriers and facilitators associated with the provision of these services should be investigated. In addition, it is noteworthy that there is a growing evidence that support the use of behavioral change theories to identify facilitators and barriers of a specific behavior. An example of such theories is the "Capability, Opportunity, Motivation, and Behavior" (COM-B) model.^[13] The use of the COM-B model can allow the identification of a wide range of factors that may influence the provision of wound care services by CPs. The previous studies that investigated the facilitators and barriers for the provision of wound care services did not use any behavioral change theory in their investigation.^[5,7]

Therefore, this study aims to explore the types of wound care services provided by Malaysian CPs, and the factors associated with its provision using the COM-B model. Information about Malaysian CPs' current level of involvement in wound care services, as well as the knowledge of the facilitators and barriers, may help the professional pharmaceutical bodies to develop strategies to enhance the services in the community pharmacy setting.

MATERIALS AND METHODS

Research Design

This descriptive qualitative study used a semi-structured interview guide conducted among CPs in Selangor, Malaysia. In Malaysia, there are approximately 23,000 registered pharmacists with about 20% of them are practicing in the community pharmacy setting.^[14] To date, there are around 4500 CPs in Malaysia,^[15] and the majority of them working in community pharmacies located in Selangor or Kuala Lumpur.^[16]

The qualitative study design was chosen to enable the collection of in-depth and rich information about the barriers and facilitators associated with the provision of wound care services by CPs.^[17] This study was approved by the Research Ethics Committee of *Universiti Teknologi MARA* (UiTM), Malaysia (REC/04/2020 [MR/87]).

Conceptual Framework for this Study

The present study utilized the COM-B model as the conceptual framework. The COM-B model was selected as the conceptual framework since it covers an extensive range of possible variables that influence a behavior of interest.^[13] It is noteworthy that well-known behavioral change models such as Theory of Planned Behavior and Health Belief Model do not address variables such as impulsivity, habit, self-control, and emotions, that are covered in the COM-B model.^[13] The COM-B model has been successfully used in qualitative studies to explore the barriers and facilitators for systematically registering adverse drug reactions,^[18] and maternal vaccinations^[19] among HCPs including pharmacists. The definition of each component of the COM-B framework is as the following:

1. Capability (C): The psychological (e.g., knowledge and understanding) and physical (e.g., practical skills) capacity of the individual to engage in the activity of interest.^[13]
2. Opportunity (O): The physical opportunities that are permitted by the environment (e.g., time, equipment, location, and resources) and the social opportunities that are permitted by interpersonal relations and influences.^[13]
3. Motivation (O): The processes produced in the brain that stimulate and direct individual behavior. Motivation is subdivided into reflective (e.g., intentions, planning, evaluations, and moral beliefs) and automatic motivation (e.g., emotional reactions, needs, and desires).^[13]
4. Behavior (B): Human activity of interest. In this study the behavior of interest is the provision of wound care services by CPs.^[13]

According to this model, the provision of wound care services (i.e., behavior) is influenced by capability, opportunity, and motivation.^[13] Figure 1 shows the components of the COM-B model and specification of the relationships between them.

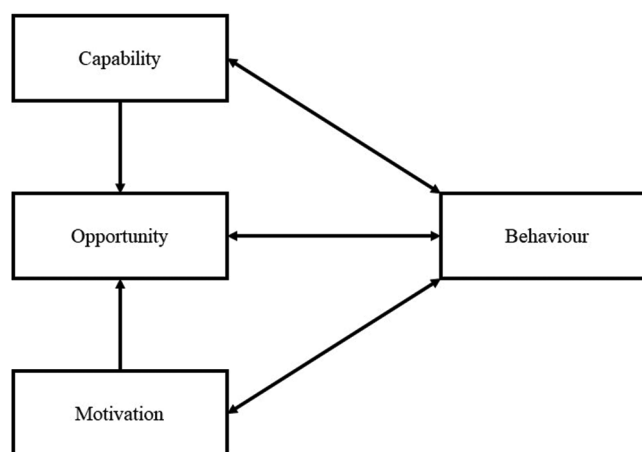


Figure 1: Conceptual framework of the study

Sampling of Study Informants

The study utilized the maximal variation sampling method to purposively select CPs in the state of Selangor, Malaysia who varied in age, gender, and years of working experience, as well as the type (i.e., independent or chain) and location setting (urban, suburban or rural) of their community pharmacy.^[20] The sample size depended on theoretical saturation, in which the recruitment of informants continued until no new theme emerged, and the research objectives had been achieved.^[21]

At first, potential informants were identified from the researchers' professional networks. These informants were subsequently selected using the snowball sampling technique. CPs who were interested to participate were emailed an invitation. A description of the method and aims of the study were also provided in the e-mail. Through a follow-up, an interview date and time were arranged with each CP.

In this study, CPs working full-time at independent or chain community pharmacies in Selangor with a minimum of 1 year of working experience in the community pharmacy setting, and who were able to understand and converse in English or Malay, were eligible to participate. CPs working part-time or those whose job scope confined them to administrative responsibilities were excluded from the study.

Study Instrument

A semi-structured interview guide was developed, based on the COM-B model and relevant literature.^[13] Three social pharmacy researchers reviewed the interview questions to ensure their relevance, as well as the clarity of language and wording. The interview guide was piloted on a CP and a pharmacist academician. The review of the interview guide by the reviewers, and the pilot test showed that the questions were clear and easily understandable. A survey form was also developed to collect the informants' demographic characteristics. The questions used in the semi-structured interview guide were as follows:

1. What do you know about wound care? Does your knowledge in wound care influence whether or not you provide wound care services?
2. What prevents you from providing wound care services, and what encourages you to provide these services?
3. How does the environment at your workplace influence whether or not you provide wound care services?
4. In your opinion, is there a demand from the public and patients for you to provide wound care services? Why or why not?
5. How much do you want to provide wound care services?
6. How confident are you in your ability to provide wound care services?
7. Do you feel that providing wound care services is something you should do? Why or why not?

Data Collection

All interviews were conducted face-to-face, except for one interview that was conducted through a telephone call. All CPs provided informed consent to participate in the study. The interviews were conducted in English or Malay, based on each informant's preference. Each interview lasted

approximately 45–60 min and was audio-recorded. All CPs provided permission for the audio-recording. Field notes were taken during the interviews. For each CP, the interview was conducted only once. The data collection was concurrently performed with data analysis to check for data saturation. Data collection ceased with twenty-three informants as the data had reached theoretical saturation.

Data Analysis

The interview recordings were transcribed verbatim by one of the investigators (HD). Transcripts in Malay were translated into English, and back-translated to ensure consistency with the original transcripts. Deductive content analysis (the categorization of data into pre-defined categories) was performed by HD. In this process, data were coded or categorized as barriers to or facilitators for the provision of wound care services, according to the three COM-B domains, that is, capability, opportunity, and motivation.^[13] Based on the informants' answers from the interviews, we identified the specific wound care service that was associated with the barriers or facilitators mentioned.

Information on the practices of wound care services (i.e., behavior) was categorized accordingly. An independent researcher checked HD's coding to strengthen the credibility of data analysis. The final coding was discussed with the other research team members and discrepancies were resolved through consensus. All data were managed using NVivo PLUS (version 12, QSR International). The chosen quotes were presented to capture the meaning of the statements provided by the CPs.

RESULTS

Characteristics of Participants

Table 1 shows the characteristics of the CPs recruited for the study. Overall, twenty-three CPs ranging in age from 26 to 61 years old participated in the study. The majority were female (14/23, 60.9%). The duration of the CPs' working experience ranged from one to 28 years. Only one CP had a qualification higher than a bachelor's degree. Almost 70% (16/23) were working in independent pharmacies, whereas the rest were employed by chain pharmacies. Of all the CPs, only 34.8% (8/23) had ever attended wound care training.

Provision of Wound Care Services

All the CPs admitted that they had attended patients with wounds at their pharmacy, with a majority of the patients presenting with minor or uncomplicated wounds. Table 2 shows the type of wound care services provided by CPs in this study. All the CPs (23/23, 100%) mentioned patient counseling and education as the main services they provided to patients with wounds. The CPs mentioned that they usually advised patients on the correct use of wound management products, including the pharmaceuticals and wound dressings that are available in their pharmacy; they also advised patients on how to care for their wounds [Table 2: 2.1]. Many CPs (12/23, 52.2%) revealed that they occasionally received patients with wounds that required further medical attention. In this case, they would refer the patients to a doctor [Table 2: 2.2].

In addition to providing information on wound care products, several CPs (8/23, 34.8%) mentioned that they often received inquiries and requests for dietary supplements for wound healing. In response to this, the CPs assisted patients by recommending suitable dietary supplement products for wound care [Table 2: 2.3].

While the majority of CPs only provide counseling and patient education to patients obtaining wound care products

Table 1: Characteristics of community pharmacists who participated in the study (n=23)

Characteristics	n (%)
Gender	
Male	9 (39.1)
Female	14 (60.9)
Age	
30 years and below	11 (47.8)
31–40 years	5 (21.7)
41 years and above	7 (30.4)
Highest qualification	
Bachelor's degree	22 (95.7)
Master's degree	1 (4.3)
Community pharmacy type	
Independent	16 (69.6)
Chain	7 (30.4)
Location setting of community pharmacy	
Urban	15 (65.2)
Suburban	8 (34.8)
Years of working experience as community pharmacist	
<5 years	12 (52.2)
5–10 years	5 (21.7)
More than 10 years	6 (26.1)
Had ever attended training in wound care	
Yes	8 (34.8)
No	15 (65.2)

Table 2: Wound care services provided by the community pharmacists

Subtheme	Sample quote	n (%)
2.1 Providing counselling and patient education on wound care products and management	<ul style="list-style-type: none"> • We teach patients the steps... first use saline, <i>Hydrocyn</i>, or <i>Dermacyn</i>... second, apply antiseptic cream, and third, put a bandage on it. – CP08, 27-year-old female • Teach them how to clean... (<i>advise them on</i>) what cream they need to apply... how to cover (<i>the wound</i>). – CP20, 31-year-old male 	23 (100)
2.2 Referring patients to doctors for wound care management	<ul style="list-style-type: none"> • Deep wound... best to refer to (<i>other healthcare</i>) professionals." – CP09, 54-year-old male • When you see pus... greenish or yellowish... that is not a good sign... will tell them that they actually should do debridement. – CP22, 35-year-old female 	12 (52.2)
2.3 Providing recommendation for dietary supplement for wound healing	<ul style="list-style-type: none"> • I usually ask (<i>recommend</i>) them to take vitamin C. – CP09, 54-year-old male 	8 (34.8)
2.4 Providing multi-disciplinary wound care services	<ul style="list-style-type: none"> • We hire a nurse or MA... to do the procedure." – CP01, 29-year-old female 	8 (34.8)
2.5 Providing first aid	<ul style="list-style-type: none"> • I do hands-on... cleaning off wounds for customers and patients. – CP04, 45-year-old female • I go to their house to help them with wound dressing. – CP11, 30-year-old female 	7 (30.4)

MA: Medical assistant

and/or medicines at their pharmacy, some CPs (8/23, 34.8%) mentioned their involvement in wound care services in collaboration with other HCPs (e.g., doctors, nurses, and medical assistants). Those CPs mentioned regularly participating in a multi-disciplinary team to provide homecare wound cleaning and dressing services for patients who were unable to attend the hospital or clinic, such as those who are bedridden [Table 2: 2.4]. Some CPs (7/23, 30.4%) admitted providing first aid by performing wound cleaning and dressing on patients with minor wounds [Table 2: 2.5].

Perceived Barriers to the Provision of Wound Care Services

The CPs described various barriers associated with their capabilities, opportunities, and motivation to provide counseling or patient education for patients with wounds; perform first aid for minor wounds; or provide multi-disciplinary wound care services [Table 3].

Capability

Several aspects of CPs' capabilities were described as limitations or barriers to their provision of wound care services. For instance, nine CPs (39.1%) mentioned that they had little knowledge of wound care, so they experienced difficulties in providing adequate wound management advice and first aid for minor wounds. Some CPs also mentioned that their low knowledge of wound care reduced their confidence in providing multi-disciplinary wound care services [Table 3: 3.1].

At a community pharmacy, a wide range of wound care products is available, which may include dressings, strappings, bandages and supports, as well as products such as antiseptic, and skin healing and care products. Two CPs (8.7%) mentioned they were not knowledgeable about all wound care products, which limited their confidence in advising patients about the products, and performing first aid for minor wounds [Table 3: 3.2]. Three other CPs (13%) mentioned that their lack of skills in wound cleaning and dressing hindered them from providing first aid for minor wounds [Table 3: 3.3].

Table 3: Perceived barriers for the provision of wound care services

COM-B component (theme)	Subtheme	n (%)	Sample quote	Barriers mentioned are for the following service
Capability	3.1 Limited knowledge on wound care	9 (39.1)	<ul style="list-style-type: none"> I don't think I have full knowledge (<i>on wound care</i>) yet because there are many types of wounds... diabetic wounds are different, other wounds are different. – CP16, 28-year-old male Simple wounds I know... but if it's very complicated... I don't know much. – CP17, 41-year-old female 	A, B, C
	3.2 Limited knowledge on wound care products	2 (8.7)	<ul style="list-style-type: none"> How does this product works? (<i>Do they</i>) fit each other, or against each other? – CP11, 30-year-old female 	A, B
	3.3 Lack of skills in wound cleaning and dressing	3 (13)	<ul style="list-style-type: none"> Actually, it (<i>wound cleaning and dressing</i>) is simple, but for me... I am lacking a bit (<i>of the skills</i>). – CP05, 30-year-old female 	B
Opportunity	3.4 Busyness	8 (34.8)	<ul style="list-style-type: none"> At times, there are many customers, so we will be rushing to give the right observation, the right judgement (<i>for patients with wounds</i>).” – CP16, 28-year-old male (<i>The</i>) pharmacy is sometimes crowded... so to do wound dressings... (<i>services for</i>) other customers will be affected. – CP07, 28-year-old male 	A, B
	3.5 Lack of trained staff	4 (17.4)	<ul style="list-style-type: none"> We are mainly at the counter, right? (<i>Receiving</i>) prescriptions, counseling... so to do (<i>provide wound care services</i>) we need to appoint another person. – CP17, 41-year-old female If they (<i>staff</i>) do not have proper training (<i>in wound care</i>) ... better not to do it... I am afraid of wrong care given. – CP20, 31-year-old male 	A, B
	3.6 No dedicated area for wound care services	21 (91.3)	<ul style="list-style-type: none"> Our premise is a bit congested... we don't really have a place to do proper dressing. – CP21, 40-year-old female 	B
	3.7 Lack of equipment to provide wound care services	7 (30.4)	<ul style="list-style-type: none"> You must have sterile gauze, forceps, all those things... we don't have those... so that's why we cannot do it (<i>first aid</i>). – CP10, 47-year-old male 	B
	3.8 Lack of awareness among the public on the role of pharmacists in wound care	5 (21.7)	<ul style="list-style-type: none"> The public is not aware that we can do dressings. – CP17, 41-year-old female 	A, B
	3.9 Lack of guideline for CPs to provide wound care services	9 (39.1)	<ul style="list-style-type: none"> Maybe (<i>referring to the pharmacy professional bodies/organizations</i>) can make (<i>produce</i>) a proper guideline... at least (<i>for</i>) basic wound management. – CP22, 35-year-old female There must be a special SOP (<i>or</i>) protocol... (<i>on how</i>) how to handle (<i>wound cases</i>). – CP02, 61-year-old female 	A, B, C
Motivation	3.10 Lack of confidence	10 (43.5)	<ul style="list-style-type: none"> Something more serious like a deep cut or with diabetic patients ... and (<i>the</i>) patients asked me for advice... I can say maybe (<i>I am</i>) 60-70% (<i>confident</i>). – CP07, 28-year-old male 	A, B
	3.11 Fear of handling wounds	1 (4.3)	<ul style="list-style-type: none"> If there is a lot of bleeding or whatnot... I will be afraid to do it (<i>first aid</i>). – CP08, 27-year-old female 	B

CPs: Community pharmacists; SOP: Standard operating procedure; A: Counseling and patient education on wound care products; B: Provision of first aid; C: Provision of multi-disciplinary wound care services

The CPs mentioned several reasons for their limited wound management knowledge and skills, such as the limited coverage of wound care topics in their undergraduate pharmacy curriculum (6/23, 26.1%), their lack of training in wound care (4/23, 17.4%), and the lack of emphasis on wound care topics during their provisional pharmacy training (1/23, 4.3%).

Opportunity

Being busy was not regarded as a factor preventing CPs from providing patients with counseling on wound care products. However, this was a barrier to effective counseling as being busy often made CPs rush the counseling due to other pressures (e.g., a high number of customers, and appointments with

other patients) (8/23, 34.8%). Busyness was mentioned by some CPs as a barrier to providing first aid for minor wounds. Many CPs held the opinion that the procedure was time-consuming and potentially disruptive to other services at the pharmacy, especially during peak hours [Table 3: 3.4].

Several CPs (4/23, 17.4%) indicated that the lack of pharmacy staff who were trained in wound care placed a burden on pharmacists with wound care knowledge to provide counseling [Table 3: 3.5]. In addition, for some CPs, the lack of staff trained in wound care made it difficult for the pharmacy to offer first aid services for minor wounds. These CPs stated that the provision of first aid for minor wounds by untrained staff was not recommended due to fear of mismanagement.

It was also noted that almost all the CPs interviewed (21/23, 91.3%) raised concerns about the absence of a suitable area to perform first aid for minor wounds. The CPs believed that if this procedure was to be provided, it was advisable to establish a dedicated place in the pharmacy with a comfortable and hygienic environment [Table 3: 3.6]. In addition to the need for this dedicated first aid space, the availability of suitable equipment for the procedure was also regarded as important by some CPs (7/23, 30.4%) [Table 3: 3.7].

Some CPs (5/23, 21.7%) mentioned that despite being regularly referred to by the public for advice on wound care products, most people were unaware that some CPs do in fact provide wound care counseling and basic first aid for minor wounds. As a result, CPs tend to receive low customer demand for such services [Table 3: 3.8]. Nine CPs (39.1%) mentioned that there was no guideline on wound care that had been developed specifically for CPs. The lack of such guideline made CPs unsure of their scope of responsibilities for wound care at the community pharmacy, and in multi-disciplinary wound care services [Table 3: 3.9].

Motivation

The CPs described varying levels of belief in their capabilities to provide wound care services. Many of the CPs expressed a lack for confidence in providing wound care services (10/23, 43.5%). With that being said, the CPs generally felt more confident in providing advice for minor wound care and first aid for minor wounds, while they were less confident in handling complicated wound cases [Table 3: 3.10]. The other barrier identified under this theme was a fear of handling wounds [Table 3: 3.11], which discouraged one CP (4.3%) from performing first aid for minor wounds.

Perceived Facilitators of the Provision of Wound Care Services

The facilitators of the provision of counseling or patient education for patients with wounds; first aid for minor wounds; or providing multi-disciplinary wound care services generally related to physical and social opportunities, as well as the CPs' motivation [Table 4].

Opportunity

Many CPs (10/23, 43.5%) mentioned that their wound care advice and first aid for minor wounds were in demand

among their customers [Table 4: 4.1]. The CPs believed that the increased demand for their wound care advice had arisen from the increasing numbers of patients with chronic wounds. In addition, CPs believed that their easy accessibility, the absence of a consultation fee, and the ability for patients to walk in without an appointment had made the pharmacy a preferred place for many people to obtain wound care advice and first aid.

Interestingly, some CPs (6/23, 26.1%) whose pharmacies are located near village areas, nursing homes, or working sites with many foreign workers (such as industrial areas or construction sites) mentioned that their locations create the opportunity for them to obtain more customers seeking wound care advice and first aid services from them [Table 4: 4.2]. The CPs believed that the longer distance to other healthcare facilities (e.g., hospitals and health clinics) and these patients' limited access to healthcare (especially among foreign workers) meant that many preferred to seek immediate wound care advice and/or first aid at the pharmacy. In addition, for the reasons mentioned, some CPs collaborated with other HCPs to initiate wound care services to meet the demand in these areas. These collaborative wound care services usually targeted the elderly and were performed at patients' homes or in nursing homes.

Several CPs (8/23, 34.8%) mentioned that they had completed one or more wound care courses. This made them more confident in providing wound care advice, and performing first aid for minor wounds [Table 4: 4.3]. Some CPs (7/23, 30.4%) mentioned that they had received information on wound care products from the training provided by pharmaceutical companies or suppliers or through their inquiries to them. The knowledge obtained from their training or inquiries made them more comfortable with and confident in discussing wound care products with patients [Table 4: 4.4]. Only a minority of the CPs (2/23, 8.7%) mentioned that they had been exposed to wound care topics during their undergraduate course, which had made them aware of the pharmacist's role in wound care, and promoted their interest in this area [Table 4: 4.5]. However, both CPs admitted that the coverage of wound care topics in their undergraduate studies was not extensive.

Motivation

Many CPs (10/23, 43.5%) associated wound care services with many benefits. These included the ability to help patients to achieve good therapeutic outcomes, as well as enhance the professional image of the community pharmacy sector and CPs. Moreover, some CPs stated their participation in multi-disciplinary wound care services would earn pharmacy professionals a good reputation as wound care providers [Table 4: 4.6]. In addition, it was noted that more than half of the CPs (14/23, 60.9%) were keen to become more involved in wound care, whether this was providing counseling to patients with wounds, performing first aid for minor wounds, or providing multi-disciplinary wound care services. These CPs were optimistic about their roles in wound care [Table 4: 4.7]. For some CPs, performing wound care services is a potential means to expand their services in the community pharmacy setting.

Table 4: Perceived facilitators to the provision of wound care services

COM-B component (theme)	Subtheme	n (%)	Sample quote	Facilitators mentioned are for the following service
Opportunity	4.1 Demand from customers/patients	10 (43.5)	<ul style="list-style-type: none"> Pharmacy (<i>can be</i>) their first choice to get wound care.... the service is faster, they do not have to wait, they can come walk-in... and get free advice from the pharmacist. – CP20, 31-year-old male Many foreigners (<i>referring to foreign workers</i>)... sometimes they have limited access to healthcare... we are called to do this service. – CP01, 29-year-old female 	A, B
	4.2 Location of pharmacy	6 (26.1)	<ul style="list-style-type: none"> Our area is near the village... many have problems with bedsores and diabetic wounds... that's why we started the initiative to provide wound care services. – CP01, 29-year-old female 	C
	4.3 Completion of wound care course (s)	8 (34.8)	<ul style="list-style-type: none"> I know a lot of workshops, (<i>and</i>) some classes (<i>on wound management</i>) for pharmacists and doctors... with the knowledge, we can handle (<i>manage patients with wounds</i>) better. – CP07, 28-year-old male 	A, B
	4.4 Training from pharmaceutical companies/suppliers	7 (30.4)	<ul style="list-style-type: none"> Certain (<i>some</i>) suppliers... also provide that kind of training (<i>in wound care</i>). – CP09, 54-year-old male To improve selection of wound dressings, we will ask the suppliers, (<i>or</i>) sales reps (<i>representatives</i>). – CP01, 29-year-old female 	A
	4.5 Exposure to wound care topics during pharmacy undergraduate study	2 (8.7)	<ul style="list-style-type: none"> During (<i>my</i>) studies, it is one (<i>part</i>) of the scopes... although not very extensive... so when we become pharmacists, we know we need to handle patients with wounds as well. – CP20, 31-year-old male 	A
Motivation	4.6 Perceived benefits from providing wound care services	10 (43.5)	<ul style="list-style-type: none"> The patient came back and tell you the outcomes... it gave us confidence. – CP09, 54-year-old male We can get a good reputation. – CP12, 28-year-old female 	A, B, C
	4.7 Being optimist of their role as wound care providers	14 (60.9)	<ul style="list-style-type: none"> For me, I would like to grab any opportunity (<i>in wound care</i>). You can look at the big picture... in other countries, (<i>the</i>) pharmacists have a very big role in wound care management. – CP11, 30-year-old female 	A, B, C

A: Counselling and patient education on wound care products; B: Provision of first aid; C: Provision of multi-disciplinary wound care services

DISCUSSION

To the best of our knowledge, this is the first qualitative exploratory study to identify the provision of wound care services, and its associated facilitators and barriers among a sample of Malaysian CPs using the COM-B framework.^[13] This framework was found to be useful as it assisted the identification of various factors associated with the provision of wound care services by CPs in Malaysia.

The overall impression from this study was that as with CPs in other developing countries,^[5,7,22] CPs in Malaysia were mainly involved in wound care through the provision of patient education and counseling for wound care products and self-care. Furthermore, a small number of CPs performed first aid for minor wounds, and had been involved in a multi-disciplinary team to provide wound care services (e.g., wound cleaning and dressing) at clinics or the homes of patients. It also appeared that many CPs felt positive about their roles in wound care, and believed that wound care services can be extended in Malaysian community pharmacy settings. Moreover, our findings revealed that there is public demand for wound care advice and first aid from CPs. Together with the optimism of the CPs about their roles in wound care; this demonstrated that a major opportunity exists to further expand the roles of Malaysian CPs in wound management.

A previous study showed that a clinical pharmacist-driven comprehensive medication management program embedded within a multidisciplinary podiatrist-managed wound healing center showed potential benefits mainly through the identification of medication related problems and patient education.^[23] Another study showed that a wound care team comprising of CPs and nurses saved costs and improved chronic wound healing in nursing homes.^[24] These studies showed the potential benefits of pharmacists' involvement in wound management.

In Malaysia, the previous studies have shown that CPs provided several health promotion services such as weight-management,^[25] smoking cessation,^[26] diabetes counseling, nutritional counseling, and physical activity counseling.^[27] The services provided by CPs have been shown to result in better patient care and positive patient outcomes.^[28] Several facilitators and barriers that could enhance and impede those community pharmacy services, respectively, have been reported.^[25,27] As with other community pharmacy services, the provision of wound care services by CPs can be influenced by several facilitating and impeding factors. This study fills the gap by identifying the facilitators of and barriers to the provision of wound care services among Malaysian CPs.

The current study discovered that insufficient wound management knowledge and skills limited the CPs' capability

to provide effective advice on wound management and wound care products, and to perform first aid for minor wounds. Interestingly, even those who admitted an involvement in multi-disciplinary wound care services were reserved about describing their level of wound care knowledge. These findings are consistent with the results of a study by Ayyash *et al.* (2021), which reported that 82.2% out of 152 Jordanian CPs perceived that inadequate wound-handling knowledge and skills were the main barriers for them to offer wound management services.^[5] In addition, in a survey of 60 CPs in Dubai, 43% of the respondents rated their understanding of wounds as “fair” or “poor”.^[7] As some of the CP informants in this study mentioned, the limited wound care knowledge and skills among CPs could be attributed to the lack of emphasis on wound care topics in the pharmacy curricula and continuing education (CE) courses.

Furthermore, it was noted that the majority of the CP informants (15/23, 65.2%) had never attended wound care training. These findings can be corroborated by the results from previous studies, which reported that 75% and 60% of CPs in Dubai and Jordan, respectively, had no wound care training.^[5,7] These results evidenced a gap in wound care education for pharmacists. Since CPs are often the first point of contact for people with wounds,^[4] the reported low knowledge of wound care and the lack of training in this area among CPs should be a cause for concern. Without adequate knowledge about wound care, CPs may be unable to provide optimal pharmaceutical care to patients with wounds.^[4] Therefore, efforts to enhance wound care education among pharmacists are warranted. This can be achieved through the incorporation of wound care topics (including the roles of pharmacists in wound care) in the pharmacy curricula and CE courses.

Our findings also showed that CPs face regular requests for dietary supplements or natural products for wounds. This may be explained by the increasing interest among the Malaysian public to use these products in health management.^[29] To date, numerous natural products such as honey, *Centella asiatica*, and *Aloe vera* have been proposed as beneficial in wound healing.^[30-32] Therefore, it is expected that CPs would be frequently asked about these products by patients with wounds. Moreover, CPs should be able to assess the appropriateness of the products for treating wounds,^[33] and provide relevant information to promote the safe use of the products especially when used in combination with conventional medicines.^[34] Nevertheless, the abundance of natural products that may or may not be scientifically proven to treat wounds means that CPs may find it difficult to remain fully updated on the latest knowledge of natural products for wounds.^[30,31] Therefore, it is imperative that through CE, CPs are continuously educated about the natural products commonly used for wound care.^[34,35]

As noted in this study, the information or training provided by the pharmaceutical companies helped the CPs to become informed about wound care products, and enhanced their confidence in providing advice to patients. This highlights the important role of the pharmaceutical companies in pharmacist education in the context of wound care, especially when a wide range of wound care products are available in the market. Therefore, a continuous communication and collaboration between CPs and pharmaceutical companies

should be encouraged so that the former can remain constantly updated about the latest information on wound care products or innovations.

The current findings showed that public demand exists for wound care services (especially for wound care advice) from CPs. There was also apparent demand for first aid for minor wounds, especially from CPs whose pharmacy located near villages, and those whose nearby communities had limited access to healthcare. In Australia, it was reported that approximately 50% of rural community pharmacies in Western Australia offered wound care services.^[36] This percentage of community pharmacies offering wound care as an enhanced pharmacy service was higher than that reported in a national survey (approximately 40%) for all pharmacies in the country.^[37] Our findings and that reported in the Australian studies are evidences that there is opportunity for CPs to provide wound care services especially in rural areas. In addition, it should be noted that the current coronavirus disease (COVID-19) endemic may cause congestion at public health clinics and hospitals, so it is highly possible that CPs will receive more patients, including those with wounds. Therefore, it is imperative to ensure CPs are ready to handle patients with wounds.

In this study, none of the CPs mentioned any issues with the infrastructure at their pharmacy in terms of providing counseling or patient education for patients with wounds. However, many CPs expressed concern about the lack of a suitable space in which they could conduct first aid for minor wounds. This was mainly because community pharmacies in Malaysia generally do not require such area.^[38] However, given the move to make wound care one of the practice areas in community pharmacies, such infrastructure (i.e., a space to perform first aid for minor wounds) should be considered.

Strengths and Limitations of the Study

The major strength of this study is the use of a qualitative approach to identify the factors associated with wound care services provision among a sample of CPs in Malaysia. The use of a qualitative study design in this study allowed the elicitation of the salient barriers to and facilitators of CPs' engagement in wound care activities, such as counseling and patient education; first aid for minor wounds; and the provision of multi-disciplinary wound care services. These findings may provide the professional pharmacy bodies with evidence of the opportunities and challenges experienced by Malaysian CPs in terms of providing wound care services. In addition, the current findings may inform several strategies (e.g., providing wound care education, incorporating wound care topics in the pharmacy curricula, and promoting collaboration among pharmaceutical companies and CPs) to further enhance CPs' wound care services.

However, the study has several limitations. First, since the study only included a small number of CPs, it is difficult to generalize the study findings. Nevertheless, it should be noted that the goal of a qualitative study is to provide rich, contextualized understanding of a topic.^[39] As with other qualitative studies, generalization is not the central goal of this study. Moreover, since CPs were only recruited from a single state, the study findings may not be transferable

to CPs in other states of Malaysia. In addition, the total CP sample included only a small number of those who provided first aid for minor wounds and multi-disciplinary wound care services. This issue can be addressed in future studies by incorporating more CPs providing the services. This will allow deeper understanding about pharmacist's roles and challenges in providing the services. Furthermore, since the interview topic revolved around CP practices, the study findings were potentially subject to social desirability bias. To minimize this bias, the researchers maintained the anonymity and confidentiality of the study informants. It appeared that the bias was somewhat reduced since the CPs provided balanced answers that included both engagement and non-engagement in wound care activities, as well as facilitators of and barriers to wound care services. Finally, since this study was qualitative in design, it could not determine the extent to which the identified barriers and facilitators correlated with the CPs' provision of wound care services. A future study can conduct a quantitative survey using a specially designed questionnaire so that factors that are statistically associated with CPs' provision of wound care services can be determined.

CONCLUSION

CPs in Malaysia commonly provides advice and education to patients with wounds. A minority of the CPs provided first aid for minor wounds and multi-disciplinary wound care services. Limited wound care knowledge and skills limit the quality of advice given by CPs to patients; this also made them less confident in providing first aid for minor wounds and multi-disciplinary wound care services. There is an urgent need to improve wound care education among CPs. Continuous communication and collaboration with pharmaceutical companies are warranted as this would ensure that CPs remained continually updated with new information about wound care products. The current findings demonstrated that public demand for wound care services (mainly counseling and patient education) exists, so CPs should be made ready to provide such services. Despite the demand for first aid for minor wounds, this service is limited by the lack of suitable infrastructure at the typical community pharmacy. Furthermore, most CPs felt positive about their roles as wound care providers. Professional pharmacy bodies may utilize the findings from this study to develop strategies to further enhance wound care services by CPs.

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AUTHOR'S CONTRIBUTION

Mohd Shahezwan Abd Wahab: Conceptualization, Methodology, Formal analysis, Investigation, Data curation, Writing – Original draft, Writing – Review and editing, Supervision. Hamidi Drahman: Conceptualization, Methodology, Formal analysis, Investigation, Data curation,

Writing – Original draft. Mohd Faiz Mustaffa: Resources, Writing – Original draft. Azyyati Mohd Suhaimi: Project administration, Writing – Review and editing.

ETHICS APPROVAL

This study was approved by the Research Ethics Committee of *Universiti Teknologi MARA (UiTM)*, Malaysia (REC/04/2020 [MR/87]).

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CONFLICT OF INTEREST

The authors have no conflict of interest to declare.

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