QATAR UNIVERSITY

COLLEGE OF PHARMACY

COMMUNITY PHARMACISTS' SELF-PERCEIVED COMPETENCY, AND ENABLERS, AND BARRIERS TOWARDS THE MANAGEMENT OF COMMON MINOR AILMENTS IN QATAR

BY

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Abstract

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Title: Community Pharmacists' Self-Perceived Competency, and Enablers, and Barriers Towards the Management of Common Minor Ailments in Qatar..

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The study aimed to assess community pharmacists' self-perceived competency, and enablers and barriers towards managing common minor ailments in Qatar, and its predictors.

A cross-sectional study, with pretested questionnaires, was conducted among a purposive sample of 307 community pharmacists working in independent and chain community pharmacies in Qatar. Self-perceived competency was assessed with nine condition-specific and three non-condition specific elements on a scale of 1-10. Data analysis was done with Mann-Whitney U, Kruskal-Wallis, and binary logistic regression tests.

In conclusion, self-perceived competency was highest for constipation and cold / catarrh, while the competency elements with the highest scores were the ability to recommend OTC medications and counsel on usage. Female gender, working in chain pharmacies, and counselling practice were the significant predictors of self-perceived competency. Some of the self-perceived enablers identified were the availability of tailored training programs and access to drug information resources, while lack of private counselling space; and opportunity to participate in pharmacy practice research were some of the self-perceived barriers identified. Female gender, age ≤ 40 years, and counseling practice were the predictors of self-perceived enablers.

Dedication

This thesis is dedicated to my father, Ashraf, for his endless devotion and continuous encouragement. I am also blessed for having my siblings, Hana, and Ashraf, who are always ready to give my research the priority in their lives. It is also dedicated to my supportive wife, Nesma, without whom I would not have earned this degree.

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Chapter 1: Introduction

Background

Self-care of medical conditions perceived especially as minor is a health-seeking phenomenon that dates back to the beginning of time. This is because history is replete with accounts of Mankind's self-care practices often with medicinal products of plants and /or animal origins (1). Self-care has been defined as the ability of individuals, families, and communities to promote health, prevent disease, maintain health, and to cope with illness and disability with or without the support of a healthcare provider (2). The widespread availability of modern medicines shortly after the end of the second world war resulted in maximal reduction in morbditiy and mortality attributable to more serious communicable and non-communicable diseases. However, the increased access to modern medicines appeared to have also contributed to the increasing pervasiveness and use of self-care / self-medication as a health-seeking and / or promoting strategy especially for medical conditions perceived as minor in both developed and developing settings (3). Self-medication is "the selection and use of medicines by individuals to treat self-recognized illnesses or symptoms" (4). Responsible self-medication requires that the used medications should meet acceptable levels of quality, safety, and efficacy besides having an approved indication for self-recognizable conditions. In addition, self-medication should be supported by sufficient information that guide appropriate use, including possible side effects and drug interactions, precautions and warnings, duration of use, and when professional advice must be sought (4). The application of the self-care concept has been considered a suitable approach to handle the category of diseases referred to as "minor ailments" (5,6).

Minor Ailments

A minor ailment (also known as minor illness) is defined as "a medical condition that requires little or no medical intervention" (7). Minor ailments are characterized as acute, non-serious, and self-limiting conditions (8). Therefore, a minor ailment condition is uncomplicated, unlikely to become life threatening, does not cause a major health risk, and does not require hospitalization. Furthermore, minor ailments are usually short in duration, easy for people to diagnose and; can be treated with Over The Counter (OTC) medications (9).

Unlike the word "minor" may suggests, minor ailments have become a critical contributor to the heavy clinical and financial burden within healthcare systems all over the world. Several studies, especially in the United Kingdom (UK) and Canada, demonstrated that a considerable proportion of primary care and emergency department resources were consumed in minor ailment consultations (10–17). For example, there is increasing evidence of the negative impact of minor ailment consultations on the workload of physicians in a range of settings (e.g., General Practice (GP) and Accident and Emergency department (A&E)) resulting in avoidable finacial and clinical burden within the health care system (10–17).

However, several studies especially in developing setting continue to show that the costs associated with minor ailments are indeed avoidable and can be reduced with the delegation of the task of managing minor ailments to primary health care professionals such as community pharmacists. For example, the minor ailments treated by physicians in British Columbia were associated with costs of $95 million, of which $32 million could be saved if the minor ailments were managed by pharmacists (12). A later study in Ontario showed that about 1 million hours of physician time were related to minor ailments that could be handled by pharmacists with net savings of $12 million over 5 years, allowing the family physicians to free 25% to 33% of their visits (10). Similar

findings were reported by a study in Canada (18) that showed that minor ailment consultations account for 10-20% of physicians' workload causing up to 12.5% of government payments to physicians; whereas, 500,000 more canadians could have access to family doctors if only 16% of minor ailment consultations by physicians were managed by an alternative primary care service such as community pharmacy-based minor ailment service. These costs-saving appeared considerable and could significantly mitigate the clinical and financial burden associated with management of minor ailments in high-cost settings such as secondary, tertiary, and emergency care settings.

Consequently, shifting the management of patients with minor ailment-only complaints to other suitable primary care setting such as community pharmacies, would shift the demand from high-cost services, reduce patient waiting times and allow physicians to focus on the more serious medical conditions (8,11,12). The desire to achieve this potentially cost-mitigating transition within the health care system appeared to underline several intitatives by a number of developed countries to maximize community pharmacists' potential to improve public health by expanding their technical capacity and authorizing them to provide standardized, structured effective and relatively cheaper community pharmacy based minor ailment services (CPB-MAS) (7,14,15,18). The choice of community pharmacists to assume the task of providing minor ailment services seems appropriate as they are uniquely positioned for this role (18). Firstly, from accessibility perspective, patients can easily find a community pharmacy in their neighborhood without having to travel for long distances. This easy geographic access to community pharmacists can enhance the quality of healthcare services available to patients at practically their doorstep, and this can potentially enhance public health (21). Secondly, patients can easily have a private or a semi-

private consultation with the community pharmacists without having to wait for a long time, and this can potentially improve timely access to care for minor ailments and patient satisfaction, and can reduce the need to visit high cost health care settings (22). Thirdly, community pharmacists are trained medication-use experts that can effectively handle minor medical conditions that do not warrant a referral to a physician, and this has been shown to decrease the workload at more expensive healthcare settings (e.g. ED and primary healthcare) and also allow these settings to focus its resources, including physicians time, on the more serious and life threatening conditions. Several studies have investigated the outcomes of ceding the task of managing minor ailments from high cost settings to community pharmacy based minor ailment services, and their findings revealed that it did not only result in positive clinical outcomes, but also the financial savings to the health care system were considerably significant. A systematic review in the UK (15) revealed that positive clinical outcomes such as low re-consultation, and high symptom resolution rates relative to GPs were associated with community pharmacist-delivered minor alment services. It is clear from the foregoing that published studies related to community pharmacy-based minor ailment services were mostly conducted in developed settings as studies from developing countries are few and far between. Yet, minor ailments abounds irrespective of settings, and are encountered considerably by community pharmacists in both developed and developing settings. Indeed, self-care practices including unguided self-medication related to medical conditions perceived as minor by patients are well reported in developing countries (23–29). Therefore, findings from the current study will provide new perspectives that may significantly add to the global knowledge in the research area.

Study aim and objectives:

This study aims at evaluating the baseline perceptions of community pharmacists in Qatar in regards to their management of minor ailments.

The current study has the following objectives:

Primary Objectives:

- To investigate community pharmacists' self-perceived competency to manage selected, common minor ailments.
- To investigate community pharmacists' self-perceived enablers of and barriers to the management of minor ailments.
- To identify the determinants of community pharmacists' self-perceived competency and self-perceived enablers of and barriers to manage minor ailments.

Secondary Objectives:

- To determine the association between community pharmacists' information gathering practice and self-perceived competency to manage minor ailments.
- To determine the association between community pharmacists' counselling practice and self-perceived competency to manage minor ailments.

Anticipated contributions / Significance of the study

The study will provide new perspectives that can potentially contribute to the body of published knowledge related to the self-perceived competency of community pharmacists to manage selected commonly encountered minor ailments in a developing setting like Qatar. In addition, study will also provide baseline data regarding the possible self-perceived enablers of, and barriers towards effective management of minor ailments by community pharmacists in Qatar. This study is particularly important in a developing country like Qatar that has invested heavily in a National Health Strategy (30) focused on the provision of functional primary health care services that meet patients' needs at their doorstep. One of the strategic focus of the Qatar's National Health Strategy is related to the active involvement of community pharmacists in the proposed integrated health care model targeted towards providing easy access to functional health care services at the primary care level. Therefore, a baseline assessment of the self-perceived competency of community pharmacists to manage common minor ailments in Qatar is clearly warranted. In addition, an assessment of the self-perceived enablers of and barriers to community pharmacists' ability to manage minor ailments effectively will provide valuable insights that could be used for the assessment of the state of readiness of community pharmacists to key into the strategic focus of the Qatar's National Health Strategy. Furthermore, the study findings can potentially provide the foundation for the design of future research and interventions related to practice improvements that can facilitate the introduction of professional community pharmacy-based minor ailment services in a developing setting like Qatar.

Thesis layout

This thesis is structured as follows:

i. Chapter I, introduction: this chapter gives an overview of the research focus (community pharmacy-based minor ailment services), the research objectives, anticipated contributions of this study and the thesis layout.

ii.Chapter II, literature review: this chapter summarises the relevant literature that investigated the researched topic and identifies the key arguments and the potential gaps in them. Additionally, it explains the conceptual framework that was adapted for the development of the data collection tool used for the study.

iii. Chapter III, methodology: this chapter outlines the methodological approach used in this study. It also describs how data was collected and analysed.

iv. Chapter IV, the results: this chapter presents the study findings.

v. Chapter V, discussion and conclusion: this chapter interprets and explains the key study findings and contextualizes these findings within previous studies and theory. The significance of the results is also discussed in the context of study objectives and the existing literature. The chapter also acknowledges the study strength and limitations and includes recommendations for further research. Finally, it ends with a conclusion that wraps up the key research interpretations, implications, and future recommendations.

Chapter 2: Literature Review

This chapter presents a detailed review of published literature in the research areas related to minor ailments, its frequency of occurrence and associated clinical and economic burden, and the positive impact of community pharmacists' involvement in the delivery of minor ailment services especially in developed settings. The chapter starts with a brief background about community pharmacy-based minor ailment services, including clarification of some the closely associated terms, followed by a comprehensive review of relevant published literature related to it. This was then followed by a brief description of the gaps in the published knowledge in the study area that the current study aimed to fill. The last section of the chapter provided a snapshot of the conceptual framework that was adapted for developing the data collection tool that was used for the study.

Background

Self-care is defined as "the ability of individuals, families and communities to promote health, prevent disease, maintain health, and to cope with illness and disability with or without the support of healthcare provider" (2). Self-care encompasses several elements including self-medication and whenever needed, healthcare provider assistance (2).

Minor Ailments and its associated burden on healthcare systems

Despite the perceived non-serious and non-life-threatening nature of minor ailments, they unfortunately compete with the more serious, life-threatening, or long-term medical conditions for the available healthcare resources. Minor ailments-related medical consultations are associated with the use of a considerable proportion of primary care resources. For instance, an estimated 57 million consultations related to minor ailments were annually given by General Practitioners (GP) in the UK (16). This

workload accounted for 20% of the GP total workload and accounted for a large portion of the annual National Health Service (NHS) expenditure (£2 bn) and 75% of the these costs were due to 10 minor ailments including back pain, dermatitis, heartburn and indigestion, nasal congestion, constipation, migraine, cough, acne, sprains and strains, and headaches (16,17). Similarly, around 40% of adult visits to Accident and Emergency department (A&E), resulting in annual NHS costs of £136 million, were for conditions that can be managed at the primary care level, and about 8% were for minor ailments , that could be appropriately managed by a community pharmacist (11). Results from a Scottish study were consistent with the above, where minor ailments accounted for 13.2% of GP visits and 5.3% of Emergency Room (ER) visits (13). Likewise, findings from Canada (14) were consistent with the several studies done in the UK (11,17,31,32). For example, the estimated costs and healthcare resource allocations related to minor ailments were reported in studies conducted in British Columbia was $95 million annually due to physicians' management of minor ailments (12). Furthermore, a study done in Ontario reported nine-hundred and forty-five thousand hours of physician time spent on the management of minor ailment, with possible saving of about $12 million over 5 years if the minor ailments were handled by pharmacists (10).

In summary, the burden of minor ailments on the utilization of healthcare resources seems evident and several interventions have been proposed as effective approaches to relief the burden imposed on healthcare systems by minor ailments (33). The proposed interventions were essentially focused on the principle of self-care where patients are empowered with the right knowledge to appropriately manage minor ailments. In addition, interventions given strong consideration involve the shift of the task of managing medical conditions considered as minor from the more expensive settings to

less expensive healthcare setting involving primary care professionals such as community pharmacists (34).

(a) Self-care as an approach to manage minor ailments

Many governments have devoted resources to advertise the concept of self-care to the public. The main aim of these advertising programs was to make sure that the public are aware of this concept and how they can properly practice self-care with a specific focus on how to self-manage simple and self-limiting diseases such as minor ailments without the need to visit a physician. In order to better understand how the proposed self-care model fits within the bigger picture of the healthcare system, a concept called "The Self-Care Continuum" was introduced by self-care forum in the UK (35). This concept will be explained in more details below.

The Self-Care Continuum

Self-care continuum is a sliding scale that begins with pure self-care, where it is the individual's full responsibility to maintain good health by eating healthy diet, practicing healthy habits and physical exercise, and maintaining good personal hygiene. The continuum ends with chronic medical condition and major trauma cases, where pure medical care, with full responsibility of healthcare professionals, is provided until full recovery (Figure 1) (35). Several studies have shown that responsible self-care practice reduces health expenditure and decreases pressures on General Practitioners (GPs) (6,16,36).

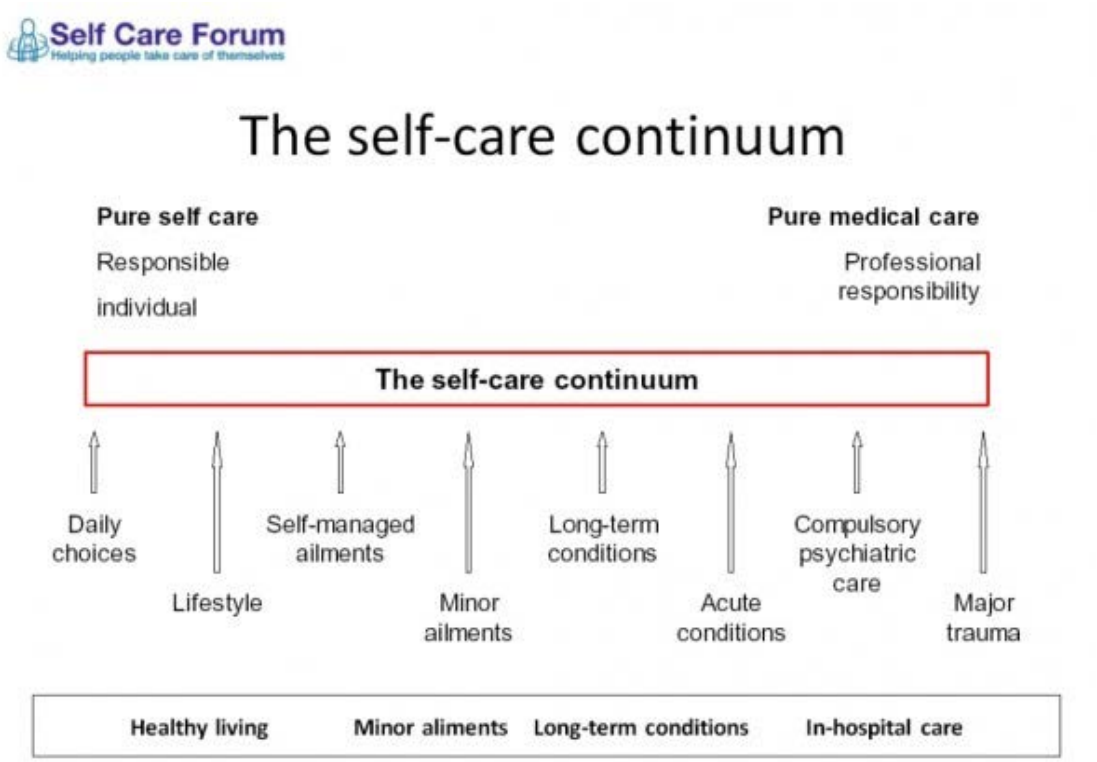


Figure 1. The self-care continuum

Source:

Self-Care Forum. Available from:

http://www.selfcareforum.org/about-us/what-do-we-mean-by-self-care-and-why-is-good-for-people/

The essence of self-care is to empower people to take greater control of their health and to maintain healthy routines and practices that will help them prevent illness in the long term. This will allow physicians to focus on patients with conditions that include higher risks such as those with comorbidities, elderly, and very young patients, and those with long-term medical conditions. This will subsequently result in a better healthcare resource allocation and long-term service sustainability. It has been suggested that shifting patients with minor ailment-only complaints to other suitable alternatives such as community pharmacies or self-care would result in a reduction in patient waiting

times and would allow physicians to focus on the more serious conditions (19,20).

Banks (2010) and Porteous et al. (2016) showed that people had preference to manage minor ailments by self-care (5,6). However, for a variety of reasons (6) people often abandon self-care earlier than they should do and start to seek medical help within 4-7 days of having symptoms initially perceived as minor. These reasons adduced include perception that symptoms should have ended earlier (which may not be the actual case, e.g., symptoms of cold can last up to 14 days), a need for reassurance that the minor ailment condition is not serious; and obtaining an actual prescription for medicines despite availability in the market as an OTC medication.

Pharmacists' role in self care

The Over-The-Counter (OTC) medications are traditionally used for the management of minor ailments either during self-care or encounters with community pharmacists (37) Community pharmacists are in ideal position to promote responsible self-care and self-medication due to being trusted by the public, easily accessible and having a long history of providing effective and safe healthcare services (38–41). WHO in collaboration with the International Pharmaceutical Federation (FIP) reported several roles for pharmacists in supporting self-care practices (42). These include assisting the patient to make informed choices about self-care, by placing greater focus on illness management, prevention, and health maintenance, providing informed and objective high-quality advice on medicine and their use and, referring the patient to a physician whenever necessary. WHO and FIP recommended investing efforts in pharmacists' education, training, self and peer-audit for their practice, and focusing on ethical principles rather than commercial factors when recommending products for patients (42).

(b) Community Pharmacy Based Minor Ailment Services (CPB-MAS)

Community Pharmacy-Based Minor Ailment Services (CPB-MAS) have been developed and implemented by several developed countries with a specific focus on streamlining and advancing community pharmacists' contributions in supporting self-care practices related to minor ailments. Community pharmacists' knowledge and experience were utilized to handle the patients with minor ailments in a structured and standardized way. To illustrate, these services were introduced in several parts of the UK (e.g. England (43), Wales (44,45), Scotland (46), North Ireland (47)), in the majority of Canadian provinces (48), and on the policy agenda in Australia (49) and New Zealand (50).

Despite the variation in the structure and service delivery outlines of the minor ailment services introduced in these developed countries, the basic essential features are similar (39,51–54). For example, community pharmacists are required to make a structured and documented assessment of the patient, provide advice, offer treatment option(s), plan a follow up, and make a referral if needed. In addition, most minor ailment services will require community pharmacists to complete a special training prior to permitting them to provide the service. Mariyam et al. (55) described ten CPB-MAS characteristics and these are: (i) Patient groups (which defines who will utilize the service); (ii) Accessibility (which defines how the eligible patient will access the service i.e. through GP referral by simply self-referral); (iii) Service specifications (is it offering advice only, or advice plus a suitable OTC medication, or advice plus a referral to a more appropriate healthcare professional); (iv) Patients' cost (all the UK services were offered free to the eligible patients that are exempt from prescription charges); (v) Staff involved in minor ailment services (pharmacists only or pharmacists plus trained pharmacy staff members); (vi) Privacy requirements (the requirement of a private, confidential setting for service delivery); (vii) minor ailment treated (the list of minor

ailments covered by the service); (viii) Minor ailment services formulary (the development of a local formulary which covers OTC medications); (ix) Additional pharmacist training requirement (the need for pharmacists or pharmacy staff members to complete additional training or competency assessments prior to delivering the service); and (x) Remuneration schedules (presence or absence of pharmacy reimbursement).

Positive outcomes associated with minor ailment services

In 2011, Baqir et al. (56) found that minor ailment services help to unburden NHS resources by shifting minor ailment care from high-cost settings such as GPs to community pharmacies. Two years later, Paudyal et al. (2013) (57) systematically reviewed literature to assess CPB-MAS outcomes. He reported that the services were associated with positive health-related outcomes (e.g., low re-consultation rates and high symptoms resolution rates). Additionally, a decrease in total number of minor ailment-related consultations were also found. Watson et al. (2015) confirmed these findings and explored the impacts of minor ailment services by comparing health-related and cost-related outcomes in three different settings including emergency departments (EDs), general practice (GPs) and community pharmacies. He concluded that community pharmacies were associated with similar health-related outcomes compared to the other two settings but at substantially lower costs (58). Furthermore, the aforementioned results were consistent with the later work of Rafferty et al. (2017) who demonstrated that these services allow for cost savings and better access to healthcare resources in Canada (59).

Stakeholders' attitudes towards CPB-MAS

Key stakeholders include but are not limited to: (a) the consumers of the services, (b)

physicians, and (c) community pharmacists. Studying the feedback of each of the stakeholders will contribute to a better service design and development, and a deeper stakeholder-engagement in the services. The summary of the published findings related to stakeholders' attitude to CPB-MAS is as stated below:

A) Consumer attitude towards CPB-MAS

Consumers have been surveyed in several studies to understand their opinions related to the CPB-MAS, and they generally tend to have positive views and high level of satisfaction towards CPB-MAS. This has been demonstrated by the work of Pumtong et al. (2011) who indicated that surveyed patients showed high levels of satisfaction regarding minor ailment services in terms of ease of access and convenience. Additionally, Mansell et al. (2015) (60), Taylor and Joubert (2016) (54), in Canada, and McKeirnan and MacLean (2018) (61) in USA confirmed the positive perception of the public towards CPB-MAS. These findings were consistent with previous studies that suggest that the public believe in the role of community pharmacists as effective facilitators for self-care and self-medication practices (38,62,63). A recent study by Policarpo et al. (2019) (64), also reported that the majority of Portuguese population has a strong positive attitude towards the community pharmacists' management of minor ailments, and they express high levels of satisfaction and positive feedback. However, an exploratory, qualitative, focus group-based study by Gidman and Cowley (2012) (65) in Scotland, reported that some of the public would prefer to a GP-led service to the pharmacist-led , attributing that to more confidence in GPs and the availability of private consultation settings. Gidman et al. recommended improving communication and information sharing between community pharmacists and GPs to support the extended pharmacy roles.

Although developing countries have not yet launched any structured minor ailment services, community pharmacies have been playing a historical role in providing (advice and treatment options for many minor ailments. Several studies indicated that the public perception towards community pharmacists and their services were positive. For instance, Hasan et al. (2015) (66) in UAE reported that consumers were willing to utilize primary care pharmacy services and were receptive to information from the pharmacists on medications and self-care. Similarly, in Ghana, Okai et al. (2019) (67) recently stated that the majority of public depend on community pharmacists to treat minor ailments and are responsive, friendlier and capable. Contrary to the findings of the previously mentioned studies, a study in Qatar (68), showed that the public have a poor understanding of the community pharmacists' several roles including the provision of drug information, and this was attributed to the insufficient contact time between consumers and pharmacists and the unsatisfactory knowledge level of pharmacists.

B) Physician's attitude towards CPB-MAS

Taylor and Joubert (2016) (54) indicated that physicians do not strongly support CPB-MAS for several reasons. For example, some physicians believe that pharmacists may not have enough training to perform diagnosis or triaging of minor ailments. Additionally, pharmacists are both untrained and unauthorized to physically examine the patients, and some conditions may be more serious than they seem, and pharmacists may miss these. In addition, there are ethical reservations regarding the appropriateness of pharmacist diagnosing, prescribing, and dispensing medications for minor ailments. Lastly, physicians argued that almost no costs are saved by minor ailment services delivered by community pharmacists because many cases will have re-consultations to fix pharmacists' wrong decisions. The concerns expressed by physicians must be taken

into consideration in the design and development of CPB-MAS specially that community pharmacists may not have a private or semi-private area for patient consultation or access to patient medical history and laboratory results. Moore et al. (2014) (69) similarly reported that the initiative to expand the roles of Irish community pharmacists encountered a strong ongoing opposition from the Irish Medical Organization, and this was attributed to the lack of sufficient dialogue and communication between pharmacy and medical organizations. Conversely, McKeirnan and MacLean (2018) (61), indicated that physicians supported the treatment of minor ailments by community pharmacists, in rural community of Washington State, USA. In addition, Pumtong et al. (2011) (70) showed that GPs were generally supportive of the management of minor ailments by pharmacists.

C) Community Pharmacists' views of CPB-MAS

Community pharmacists' views and experiences about CPB-MAS have been studied extensively in developed settings (the UK and Canada) (43,54,71,72). Most of the community pharmacists showed positive views regarding the provision of CPB-MAS due to the associated clinical benefits, and the opportunity it provides for pharmacists to expand their clinical roles. However, published data on the perception of community pharmacists towards CPB-MAS in the developing settings are scanty. Literature search revealed that only one recent study by Selvaraj et al.(2010) (73) in Malaysia, tried to investigate the perceptions of community pharmacists towards assuming the role of managing minor ailment and reported that the pharmacists showed positive attitudes .

Barriers to and facilitators of CPB-MAS

Provision of CPB-MAS may be hindered by some barriers. For example, Pumtong et al. (2011) (70) reported that the lack of privacy in some community pharmacies, the

limited formulary allowed for the pharmacists, large amount of paperwork, and insufficient public awareness of both the scheme and the skills of pharmacists are barriers to the service. Paudyal et al. (2010) (72) reported that the additional administrative burden and the concern of pharmacists that the public may misuse the scheme were the main barriers from the pharmacists' perspective. In the developing countries context, there was a paucity of research on the possible barriers and facilitators to provision of CPB-MAS from community pharmacists' perspective. A recent work by Selvaraj et al. (2020) (73) in Malaysia, noted that pharmacists perceived barriers were the lack of patient's medical information, the lack of dispense separation, the absence of support from other healthcare professionals. However, the findings by Selvaraj et al. (2020) seems not generalizable as the Malaysian healthcare system differs from other developing countries. To illustrate, the Malaysian systems has no "dispensing separation", which allows physicians to combine all the processes of diagnosing, prescribing, and dispensing medications to their patients, but this is not the case in many other developing countries including Qatar. Lastly, none of the studies in the developing context investigated the self-perceived competency of community pharmacists to manage minor ailments. Therefore, there is a paucity of studies focused on the assessment of community pharmacists' self-perceived competency to manage minor ailments, and the barriers and facilitators to provide such a service in developing countries. Hence, the current study will provide new perspectives that can significantly contribute to the published knowledge in the research area.

Perception, self-perception, competency, enablers, and barriers: operational definitions

Perception is defined as the personal view that an individual has of him/herself and of reality. It is construed based on cognitive processes and on the personal sense of

person's experience (74,75). Self-perception more specifically refers to an ample and coherent pattern of beliefs related to the manner in which one perceives oneself (74,76,77). The definition of the term competency had little agreement in literature. However, from human resource development perspective, Gorsline (1996) referred to competency as the ideal combination of knowledge, skills, attitudes, and experience, the possession of which enables the employees to become high performers and have the potential to add value to the organization (78,79). According to the social cognitive theory (80–82), perceived self-efficacy, which is beliefs in one's capabilities to organize and execute the courses of action required to produce given outcomes, has a great effect on the motivation and willingness to complete a task or an action. Therefore, self-perceived competency is vastly important in shaping of behaviors such as occupational performance, and thus investigating the self-perceived competency of community pharmacists regarding the management of minor ailments is warranted as this might be one of the key drivers of their actual performance. Enablers and barriers are determinants of healthcare practice that may facilitate, or prevent improvements in practice respectively (83,84).

Information gathering and counselling practices during minor ailment management in community pharmacies in developing countries

Several observational studies from developing countries investigated the management of minor ailment(s) by community pharmacists (82-111). The process of handling minor ailment-related requests by community pharmacists can be divided into two parts (115–117), the first part is information gathering (collecting needed information for patient assessment), while the second part is patient counselling (providing advice to guide appropriate and safe medication use). During this process, the pharmacist should be able to collect sufficient information and differentiate between self-limiting

conditions that can be managed and the more serious symptoms that warrant a referral to a physician (116). Following that, the pharmacist needs to communicate recommendations or advice (pharmacological or non-pharmacological or both) to the patient, during counselling (115–119). Inconsistent and insufficient information gathering can result in inappropriate recommendations (120). Both information gathering inquiries and counselling information given by pharmacists varied widely across different developing countries (120,121). Information gathering was not consistent and may have included one or more of the following elements: asking about customers' age; signs and symptoms and duration of minor ailments; information on past or concurrent medical conditions; and medication history. Similarly, counselling provided by community pharmacists varied in terms of both type and depth and may have included one or more of the following items: information relating to regimen, drug interactions, side effects, and contraindications. Both information gathering and counselling during minor ailment management were not shown to be documented in any of these studies. Furthermore, none of the studies demonstrated the existence or the usage of any specific protocol or framework for the management of minor ailments.

Conceptual framework used for developing the section of the data collection tool on barriers to and enablers of community pharmacists' management of minor ailments

Bader el al. (2017) (122) presented a conceptual framework that can be used to identify and analyze challenges to the advancement of pharmacy. The framework was used by many international pharmacy organizations including the Accreditation Council for Pharmacy Education (ACPE), the United States National Accreditation Agency for Pharmacy Education, and the International Pharmaceutical Federation (FIP). The framework assumes that three interconnected sectors are in a dynamic relationship that

result in the advancing a given profession such as the pharmacy profession. These are: (a) education, (b) regulation, and (c) practice. Firstly, the education sector is related to preparing pharmacy workforce for practice sector by either pre-service basic education, and continuing education (CE) and continuing professional development (CPD) or any targeted training program(s). The practice sector is associated with providing a wide range of services to the society from various settings (which include community pharmacy settings in our case) whereas the regulation sector relates to the entities (from inside or outside the profession) that shapes the legal environment within which the organizations and practice operate. A practitioner (e.g., a community pharmacist) will utilize the knowledge and skills he developed during his education and consider the regulations that govern his profession to deliver his/her services to the public. Although the three sectors are separated but they are interrelated and there is a dynamic equilibrium that links them together. Fig. 2 illustrates these three sectors and the dynamic connection between them.

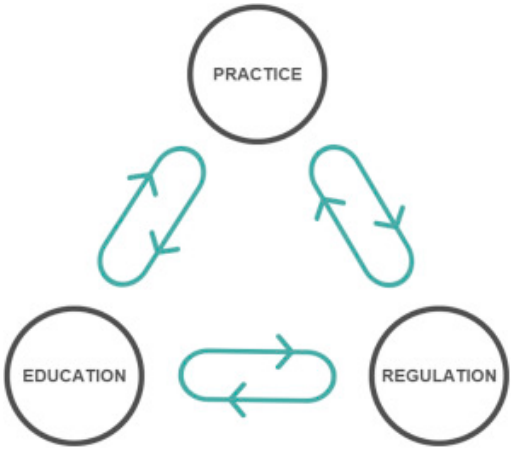


Figure 2. A conceptual framework demonstrating the dynamic relationships between education, practice, and regulation.

The model assumes that it is necessary to have “checks and balances” if there is a need to advance the pharmacy profession. The term “checks and balances” means that the

three sectors are separated and that each of them is empowered enough to amend or even prevent or oppose improper actions by the other two sectors. If checks and balances are not in place, stagnation or conflict of interests would hinder the advancement of the profession. An example of lack of separation of sectors is "self-regulation" in which the practice and regulation sectors are not separated, or the education and regulation sectors are not separated. This will result in a probably less efficient and biased regulations that oversee the sector rather than assigning this task to an independent regulatory sector. Therefore, a level of healthy separation should be maintained among the three sectors. However, this level of separation should not be too wide leading to disconnections between the different sectors, which results in dissatisfaction or frustration. For instance, if what is taught by educators in pharmacy schools is not supported by practitioners and regulators, graduates will become disappointed that they are not allowed to practice what they have been learning. In fact, changes, or developments in one sector should be challenged by the other two sectors until the best dynamic outcomes are reached. For example, when the practice needs to be changed for any reason, this should push appropriate changes to be made in education and similarly, will require regulators to impose new changes to the practice. Maintaining adequate push-pull fit between the three sectors is needed for both the integrity and advancement of the profession. Barriers to the advancement of the profession can be traced back to disconnections between the three sectors. Noncompliance to dispensing laws is a good example of a disconnect (a weak relationship) between regulation and practice.

The adapted conceptual framework

The current study found it important to add another sector that interacts with the

previous three sectors. The newly added fourth sector is “research”. This was guided by literature search on evidence-based practice. Phil Wiffen et al. (2013) (123) discussed the importance of evidence-based pharmacy as one of the main drivers that should shape changes in the pharmacy profession and the pharmacy practice. A logical assumption was made that the four sectors (i.e., education, practice, regulation, and research) operate within a wider general environmental context that can affect them. This includes international, regional, national, and local environments in which health services are delivered.

National and local environments include the public health infrastructure such as assessing if the healthcare layout put an emphasis on shifting the care away from hospitals and towards community. In addition, the public perception, and expectations of the pharmacy profession such as the level of trust in community pharmacists’ knowledge, and the public behavior related to seeking healthcare and the engagement in self-care practices are also key considerations. Additionally, the relationship among different healthcare professionals within the local healthcare system (e.g., interaction and mutual support between physicians and community pharmacists) is also an important consideration. The general environmental context and each of the four specific sectors are influenced by several factors which may enable positive changes (enablers) or hinder positive changes (barriers). Hence, enablers or barriers can also be classified to general enablers/barriers that affect the general environmental forces, or sector-specific enablers/barriers that affect a specific sector. Fig. 3 illustrates the adapted conceptual framework that was used to develop the section of the questionnaire that was focused on community pharmacists’ self-perceived enablers and barriers towards the management of common minor ailments in Qatar.

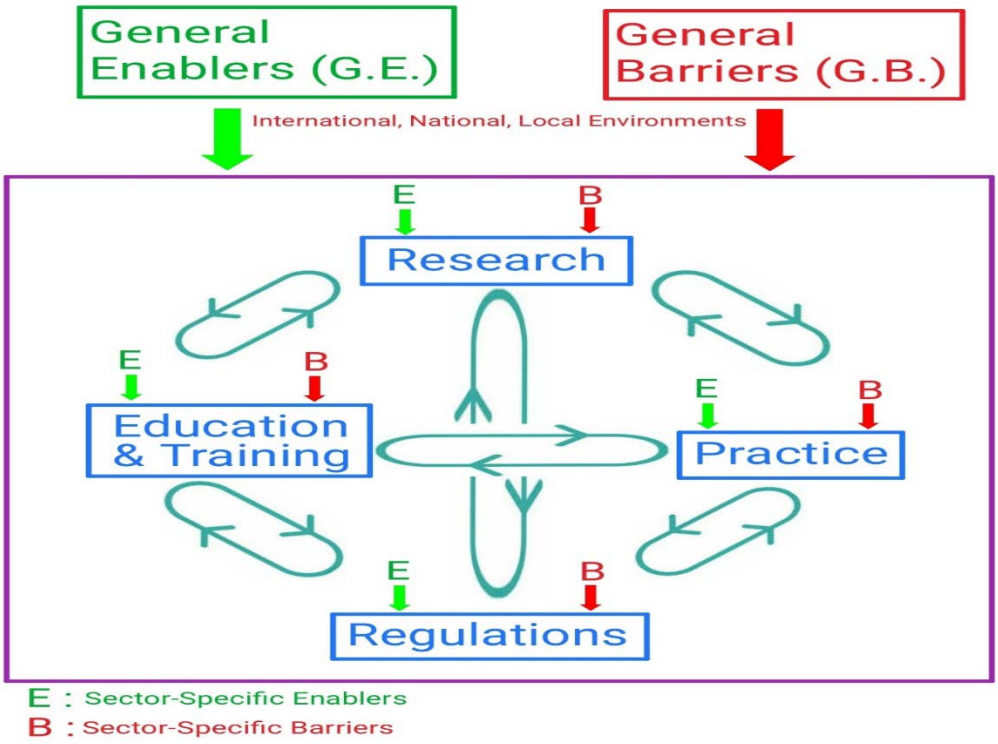


Figure 3. The adapted conceptual framework used for identifying the influencers (enablers and barriers) towards the management of minor ailments by community pharmacists.

Summary

This chapter provided relevant details related to the introduction of community pharmacy-based minor ailment services, and their associated benefits, in the international context. While minor ailments are seen and managed by community pharmacists in developing settings, this process is not yet structured nor guided by a specific protocol. This has resulted in inconsistency in the type and the depth of information gathering and counselling practices of community pharmacists when dealing with customers with minor ailment complaints. Nationally, Qatar lacks the existence of a professional pharmacy association or society that can act autonomously in order to regulate and advance pharmacy practice (124). Consequently, pharmacy

practice in Qatar still lacks the presence of a set of competency standards that can be used as a benchmark to pharmacists practicing in Qatar (124). Despite the growing evidence on the benefits of implementing community pharmacy-based minor ailment service, there is paucity of research conducted in developing settings that investigates the self-perception of the community pharmacists in relation to their competency to manage minor ailments, and the possible enablers and barriers that could facilitate or hinder the management of minor ailments by community pharmacists. Thus, the current study seeks to fill this research gap and provide a baseline snapshot that can be used to guide future intervention studies in the research area.

Chapter 3: Methodology

Study setting

This study was conducted in Qatar, a high income country, which is one of the six Arabic Gulf countries that constitute the Gulf Cooperation Council (Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and United Arab of Emirates), and belongs to the Middle East and North Africa (MENA) region (125–127). In terms of population size, Qatar is the second smallest country (2,773,885) among the six, following Bahrain (128). Qatar's healthcare system is considered one of the best and most rapidly expanding in the region (129). The delivery of public health care services in Qatar is overseen by the Ministry of Public Health (MOPH), and this is done mainly through two main governmental organizations including the Primary Health Care Corporation (PHCC) and Hamad Medical Corporation (HMC) (129,130). HMC is the largest healthcare organization in Qatar and includes public hospitals, a National Ambulance Service, and the Mobile Health Service (MHS) which is a General Practitioner-led primary care service that is delivered directly to the community (131–134). The public primary care services (including the management of minor ailments) are mainly provided through PHCC or Emergency Department (ED) in HMC hospitals and MHS service to some extent. Community pharmacies are widespread and well distributed geographically in Qatar with some of them offering 24 hours service (135). These pharmacies must be operated by licensed pharmacists and can dispense Over The Counter (OTC) medications as well as prescription-only medications. According to the Qatari healthcare planning and assessment department latest report on pharmacies in Qatar (April 2018) (136), 476 governmental and private pharmacies are distributed, unevenly, over 7 municipalities (Doha, Al Wakra, Al Rayyan & Al Sheehaniya, Umm Slal, Al Daayen, Al Khor, and Al Shamal). Only thirty-one private pharmacies across Qatar are operating 24 hours leaving three municipalities (Al Shamal, Al Sheehaniya and Al

Daayen) without 24 hours operating private pharmacies.

Study aim

The overall aim of the study is to conduct a baseline cross-sectional assessment of community pharmacists' self-perceived competency to manage selected commonly encountered minor ailments in Qatar; and identify the important determinants of the self-perceived competency. In addition, a cross-sectional assessment of the enablers of and barriers to the provision of minor ailment services by community pharmacists in Qatar was also conducted in the study.

The study consisted of two phases:

Phase 1

The phase 1 was aimed at selecting specific commonly encountered minor ailments in Qatar and this was done in two stages. The first stage involved obtaining the opinions of a purposive sample of physicians practicing in high costs settings regarding both the relevance and the suitability of minor ailments to be managed by community pharmacists in Qatar. This was achieved through an initial development of a list of 58 minor ailments after a thorough review of literature about similar initiatives involving institutional schemes that allowed physicians to move the tasks of managing minor ailments to pharmacists in United Kingdom and Canada (137–140). The second stage involved obtaining the community pharmacists' assessment of the suitability and relevance of the minor ailments selected initially by physicians.

Study design and setting

A quantitative, cross-sectional survey of a purposive sample of physicians was conducted in the Emergency Department (ED) of Al-Wakra Hospital and the Mobile

Health Services Service (MHS) both of which are public health facilties that operates under the Hamad Medical Corporation in Qatar. Both study sites were selected because of the documented preponderance of minor ailments that are encountered in such high costs setting. Hence, starting with an initial opinion of the physians who enountered minor ailments at such settings in Qatar was considered a critical components of the study.

Selection of participants

Ten physicians working in ED in Al Wakra Hospital and family physicians in MHS were purposively selected and asked to rank the most commonly encountered minor ailments in Qatar from a list of 58 that was developed after a thorough review of relevant literature (140,141) (Table 1). The physicians were asked to rank the relevance and the suitability of each of the listed minor ailment on a scale of 1 to 10. The minor ailments ranked 10 or 9 were selected for inclusion in the phase 2 of the study. In addition, the physicians were allowed to add any other minor ailment that was not included in the initial list of 58 presented to them. The 14 minor ailments selected by physicians were presented to a purposive sample of 10 community pharmacists to obtain their own assessment of their suitability and frequency of occurrence in Qatar, and there was no disgreement with physicians' ranking.

Table 1. The List of 58 Minor Ailments Compiled After Literature Review

SN	Minor Ailment
1	Dyspepsia
2	GERD (Gastro-Esophageal Reflux Disease)
3	Baby Colic
4	Constipation
5	Diarrhea
6	IBS (Irritable Bowel Syndrome)
7	Haemorrhoids (Piles)
8	Cough
9	Cold & Influenza
10	Hay fever (Seasonal Allergic Rhinitis)
11	Toothache
12	Teething In Children
13	Musculo-Skeletal Pain (Strains, Sprains, & Bruises)
14	Headache & Migraine
15	Sleep Problems
16	Travel Sickness
17	Threadworm
18	Head Lice
19	Scabies
20	Herpes Simplex
21	Fungal Skin Infections (Candida & Tinea (corporis, cruris, pedis))
22	Athlete's Foot
23	Fungal Nail Infections (Onychomycosis)
24	Ringworm
25	Sweat Rash
26	Impetigo

Table 1. (continued)

SN	Minor Ailment
27	Folliculitis
28	Other Bacterial Skin Infections
29	Childhood Infections
30	Shingles (chicken pox virus, varicella zoster virus (VZV))
31	Cystitis (acute, uncomplicated)
32	Vaginal Thrush (Vulvovaginal Candidiasis)
33	Vaginal Dryness (Atopic Vaginitis)
34	Dysmenorrhea
35	Emergency Contraception
36	Hormonal Contraceptives
37	Erectile Dysfunction
38	Conjunctivitis
39	Dry Eye
40	Ear Care (Ear Wax & Ear Infections)
41	Mouth Ulcers (Aphthous Ulcers, or canker sores, or Aphthous stomatitis)
42	Dry Mouth (Xerostomia)
43	Oropharyngeal Candidiasis (Oral Thrush)
44	Axial Cheilitis (Angular Stomatitis)
45	Sore Throat
46	Eczema (Atopic Dermatitis)
47	Contact Dermatitis
48	Seborrhoeic Scalp Conditions, Cradle Cap

Table 1. (continued)

SN	Minor Ailment
49	Psoriasis
50	Urticaria
51	Warts & Verrucas
52	Nappy Rash (Diaper rash)
53	Acne Vulgaris
54	Burns & Scalds
55	Sunburn
56	Bites & Stings
57	Cold sores (herpes labialis, fever blisters)
58	Obesity

Phase 2

Study design and setting

The phase 2 was focused on investigating the community pharmacists' self-perceived competency to manage the selected commonly encountered minor ailments in Qatar. In addition, the determinants of community pharmacists' self-perceived competency, and the enablers of, and barriers to the effective provision of minor ailment services in Qatar were also identified. This was achieved through a cross-sectional survey of a purposive sample of community pharmacists using a structured, self-administered, validated and pre-tested questionnaire. The survey was conducted between 16 June 2019 and 28 June 2020.

Target population

The study participants were selected from a target population / sampling frame consisting of all community pharmacists licenced to practice in Qatar and working for either independently owned (independent) or chain community pharmacies for at least one year. In addition, proficiency with oral and written english was also an important inclusion criteria.

Sampling method

The list of licensed pharmacists who work in community pharmacies in Qatar was obtained from the Ministry of Public Health (MOPH) and was found to contain 1016 pharmacists. The names of the community pharmacies where the community pharmacists were engaged was extracted from the list and categorized into either chains or independently owned. This resulted in a list of 256 community pharmacies out of which 192 (75%) were chain pharmacies, while 64 (25%) were independent. The final

selection of a purposive sample of the study participants was based on this ratio (chain vs independent as 75:25).

Sample size calculation

All eligible community pharmacists in Qatar constituted the sampling frame (population = 1016). RaoSoft® online calculator (142) was used to determine the minimum sample size required for the study. A margin error of 5%, confidence level of 95%, and a response distribution of 50% were used. The calculated required sample size was 279 community pharmacists. On top of the calculated sample size, an additional 10% was added to account for non-responders and possible withdrawals, and this resulted in a final sample size of 307 community pharmacists. Therefore, a purposive sample of 307 was selected to mirror the distribution pattern of chain and independent pharmacies in Qatar (75%, and 25% respectively).

Data collection tool

Questionnaire development

A 57-item questionnaire was developed after a thorough review of published studies, including grey literature, related to the provision of minor ailments services by community pharmacists (137–140). The utilization of grey literature was necessary since it provided relevant details on training manuals and guidelines for community pharmacists to provide effective minor ailment service from authoritative educational and training materials that are not normally found in published scientific studies. Additionally, a conceptual framework proposed by Bader et. al (2017) to identify and analyse challenges for the advancement of pharmacy profession (122) was adapted to design the section of the questionnaire that deals with identifying the enablers and

barriers towards providing minor ailment services. The adapted framework, explained in more details in chapter two, highlights 5 forces as the main influencers of change and hence this was adopted to assess the community pharmacists' self-percieved enablers of and barriers to manage minor ailments effectively in Qatar. These 5 forces are: general environmental factors including the support level from other healthcare professionals and the level of public trust in community pharmacists' knowledge and skills; education and training (i.e the impact of basic education, continuous professional development, pharmacy school corricula on the practice); regulation (i.e. the regulatory environment that governs the role of community pharmacists in Qatar and sets the boundaries of its scope); research (i.e. the impact of conducting and dissiminating the results of research that aims to understand, assess, and develop professional roles of community pharmacists); and practice (i.e. all the factors that are related to community pharmacy settings and the perceived level of managerial support to improve the quality of services offered by the community pharmacists). These five forces are in constantly interacting and affecting each other. Self-perceived enablers and barriers section of the developed questionnaire was formulated based on these 5 forces.

Structure of the questionnaire

The questionnaire comprised 4 main sections (A, B, C, D) including mostly close ended items. The respondents were required to rank their responses to the items on a 5-point Likert scale in section B, while a 10-point scale was used for the items in section C and D. In addition, the self-perceived competency scores obtained in section C were categorized, into meet expectation (≥80%) and below expectation (<80%). The choice of 80% was guided by the median competency score and the consideration of the simple and uncomplicated nature of minor ailments which community pharmacists were

expected to be able manage effectively based on the training and skills acquired during the undergraduate pharmacy training. The participants' rankings for section D were categorized into ≥ 8.0 (enablers) or <8.0 (barriers) where the maximum possible score for each item is 10. The cut-off of ≥8.0 was chosen because all the items in section D were positively worded.

Section A:

This section covered mainly demographic characteristics of the respondents and consisted of 7 items including gender, nationality, age-group, type of community pharmacy (chain or independent), years of work experience, and highest educational degree in pharmacy.

Section B:

Section B was divided into two parts. The first part was focused on obtaining data about community pharmacists' workload and information gathering practices. This section consisted of 10 close-ended questions requiring response on 5-point Likert scale (Always, very often, sometimes, rarely, never). The data collected in this section include the number of customers seen per daily shift, number of customers with minor ailments inquiries per daily shift and the frequency of follow up planning during management of minor ailments. Furthermore, other data collected in this section are customers' identity, age, symptoms and duration, medication history, history of any medical condition and medication or food allergy.

The second part of Section B covered the counselling and advice-giving practices offered by community pharmacists to patients during the provision of minor ailment services. This part consisted of 11 close-ended questions was focused on obtaining data

on. dose, frequency, and route of administration of recommended provided during the management of minor ailments, duration of use, storage conditions, possible side effects, contra-indications, and drug interactions. In addition, it captured the frequency of making a referral to a physician, if needed, and the average time spent with each customer during the management of minor ailments.

Section C:

This section was focused on assessing community pharmacists' self-perceived competency to manage 14 selected commonly encountered minor ailments in Qatar. Community pharmacists were required to assess their self-perceived competency with a 10-point scale ranging from 1 (Lowest) and 10 (Highest). Each of the 14 minor ailments assessed, had a maximum possible competency score of 90 for each participant (9 condition-specific competency elements multiplied by 10). Hence, the maximum obtainable condition-specific competency score for each participant for the 14 minor elements was 1260.

The three non-condition specific competency elements were measured separately (maximum obtainable score of 30 for each participant). Therefore, the maximum obtainable competency score for both condition and non-condition specific competency score for each participant was 1290 (1260+30).

The condition-specific competency elements were measured across all the 14 minor ailments and this gave maximum possible score as 140 (14 minor ailments multiplied by 10), while each of the three non-condition specific competency element was measured separately and had a maximum possible score of 10.

The competency elements assessed include the definition of minor ailments and its causes, recognition of signs and symptoms, and differentiation of symptoms of minor

ailments from other similar conditions. In addition, he other competency elements assessed include appropriate referral to a physician when necessary, non-pharmacological advice, appropriate pharmacological treatments, consideration for special populations (pregnancy, children, and elderly) and provision of detailed instructions to guide medication use. The three non-disease specific competency elements included in the competency assessment were follow up planning, documentation of information gathering, planning, recommendation, and follow-up activities, and use of information resources during the provision of minor ailment services.

Section D:

The section D includes items that were focused on obtaining data on enablers of, or barriers to the management of minor ailments by community pharmacists in key areas including general influencers (customers trust, physicians' attitude and the health care system); education and training (undergraduate pharmacy training, update of minor ailments-related content of pharmacy courses, continuous professional development related to minor ailments); regulatory framework for community pharmacy practice (layout and design, access to information resources, organizational planning and related factors and regulations and policies); and Research (participation in community pharmacy research, receipt of research results and its impact on practice).

Psychometric assessment of the questionnaire

It is critically important for a newly developed instrument (e.g. the questionnaire in this study) to be both reliable and valid (143–147). This will enahnce confidence in the accuracy and precision of measurements undertaken and the results presented if the

questionnaire is properly administered. Therefore, the following steps were undertaken to ensure the validity and reliability of the questionnaire.

a) Face and Content Validity:

Validity is the degree to which an instrument measures what it purports to measure while Face validity is the degree to which an instrument appears/seems to be able to measure what it is intended to measure (145). Furthermore, content validity is the extent to which the items of each domain are fairly representative of the entire domain. For readability, sentence structure, face validity, and content validity, 3 faculty members, from the college of pharmacy, Qatar University, who are experts in the research area, had 8 meetings to review the draft questionnairre and they provided constructive feedback which was used in revising the questionnaire for quality and content. The initial questionnaire draft was modified based on the feedback and subjected to pretesting and internal consistency reliability testing.

b) Internal Consistency / Reliability Analysis and Pre-testing:

Reliability is the degree to which an instrument consistently measures what it purports to measure (143–147). Hence, internal consistency or reliability analysis assesses the correlation between multiple items that are intended to measure the same construct. In other words, it examines the degree to which a participant answers similar items in a similar manner. Cronbach's alpha was used to estimate internal consistency in the current study. A cronbach alpha (internal consistency coefficient) value of 0.7 or more was considered acceptable for a given questionnaire section. The validated version of the questionnaire was pretested on 8 community pharmacists (5 from chains and 3 from independent) who were not included in the final survey. Pre-testing is the final

stage in the questionnaire development and aimed at testing if the questionnaire will perform as planned if administered in conditions identical to those of the actual study (148). It also provided a good feedback on the completion time of the questionnaire, and the level of understanding of questions and their clarity to the respondents. The pre-test responses were analyzed using the statistical program, SPSS version 26 (IBM Corp. Released 2019. IBM SPSS Statistics for Windows, Version 26.0. Armonk, NY: IBM Corp.) and reliability analysis was performed. Cronbach alpha values for section B part 1, Section B part 2, C, and D were 0.808, 0.849, 0.991, 0.878 respectively.

Ethical considerations

A consent form was designed and used to obtain participants' consent before the commencement of data collection. The consent form included a brief information on the study purpose and participants' right to withdraw at any point during data collection and / or skip any question. In addition, the estimated time for completion of the questionnaire and contact number of the researcher were provided. No incentive was given to the community pharmacists who participated. The study protocols including the consent form and questionnaire were compliant with the Qatar University Institutional Review Board guidelines and an approval (QU-IRB, number 1074-E/19) was obtained on 03 May 2019.

Data collection procedure

The data collection procedure was preceeded by an initial advocacy visit with an introductory letter (from the College of Pharmacy, Qatar University) to the chain and independent communty pharmacies sampled for the study (Appendix B). This was done to maximize the support and participation of the senior managers and community pharmacists working for the organization. The introductory letter provided information

such as the study purpose and the potential beneficial impact of the study on community pharmacy practice and public health in Qatar. The study participants were approached at their workplaces (i.e. morning, afternoon, and night shifts) and invited to participate in the study with a detailed explanation of the objectives of the research and their rights to or not to partcipate. In addition, a brief but detailed explanation of the various sections of the questionnaire and how to properly respond to each item was also provided to enahnce clarity. Community pharmacists who met the eligibility criteria and were willing to participate were asked to sign the consent form. Questionnaire collection took place upon completion by the study participants or not later than 3 weeks of distributing the questionnaire. At the end of the first and second weeks, a reminder was sent to respondents (via SMS, or a phone call, or a reminder visit). The community pharmacisrs who did not respond at the end of the first 3 weeks were given an additional 3 weeks with two further reminders at the end of forth and fifth weeks.

Data analysis

Data coding and analysis was done with Statistical Program for Social Sciences (SPSS) version 26 (IBM Corp. Released 2019. IBM SPSS Statistics for Windows, Version 26.0. Armonk, NY: IBM Corp.). Descriptive statistics such as frequency and percentage, mean and standard deviation (for normally distributed data), median and inter-quartile ranges (for non-normally distributed data), range (minimum and maximum) were used as appropriate to describe continuous and categorical data.

Kolmogorov-Smirnov normality test was undertaken to examine whether the scores obtained for the community pharmacists' self-perceived competency scores, and enablers and barriers were normally distributed. Both were found to be non-normally distributed ($p = 0.000$). Therefore, to compare different groups, non-parametric tests

such as Mann Whitney U test and Kruskal-Wallis test were used.

Furthermore, other tests were used to examine the possible association between community pharmacists' self-perceived competency and information gathering scores and counseling practices (Spearman rank correlation coefficient) and binary logistic regression was used to identify possible determinants of self-perceived competency scores as well as self-perceived enablers and barriers . The independent variables included in the regression analysis include age, gender, nationality, community pharmacy types, highest pharmacy degree, years of experience, number of customers per daily shift, number of customers with minor ailments per daily shift, consultation time for minor ailments, information gathering and counselling practices during minor ailment services. Level of significance for all tests was set at $p \leq 0.05$.

Chapter 4: Results

Introduction

In this chapter, a list of minor ailments obtained from phase 1 of the study was presented. This was followed by the results obtained from phase 2 which includes survey response and completion rates; the demographic and workload related profile of the sampled community pharmacists in Qatar; followed by descriptive statistical analysis of the sample data; and lastly inferential statistics used to achieve research objectives. Inferential statistics ranged from tests for association, regression analysis, and other tests for comparing between different groups of respondents based on certain factors. In chapter 1, the stated objectives of this study were:

Primary objectives:

- To investigate community pharmacists' self-perceived competency to manage selected, common minor ailments.
- To investigate community pharmacists' self-perceived enablers of and barriers to the management of minor ailments.
- To identify the determinants of community pharmacists' self-perceived competency and self-perceived enablers of and barriers to manage minor ailments.

Secondary objectives:

- To determine the difference in community pharmacists' information gathering practices during the management of minor ailments across demographic and workload characteristics including: gender, type of community pharmacy, and highest pharmacy degree.
- To determine the difference in community pharmacists' counseling practices during the management of minor ailments across demographic and workload

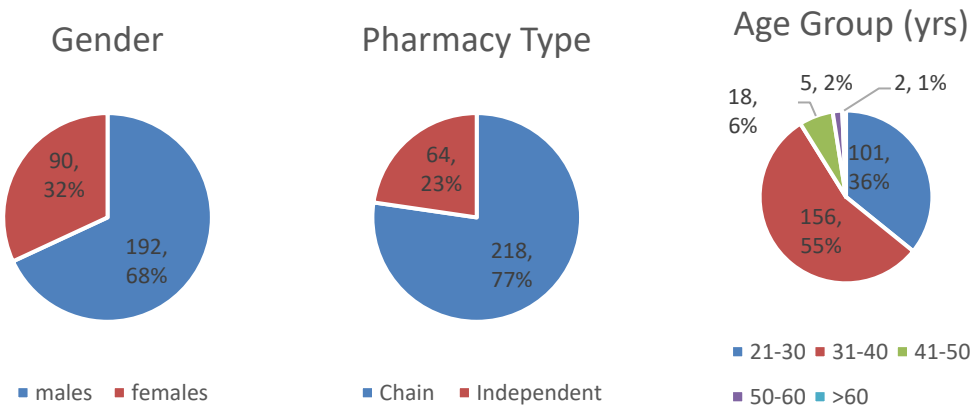
characteristics including: gender, type of community pharmacy, and highest pharmacy degree.

Results

In phase 1 of the study, fourteen minor ailments, out of the 58 presented to physicians, were given the highest scores and these were included for community pharmacists' self-perceived competency assessment in second phase of the study. Nine conditions got the highest maximum score of 10 (constipation, headache, musculoskeletal pain, travel sickness, head lice, athlete foot, sore throat, nappy rash, and sun burn), while 5 conditions got the score of 9 (cold /catarrh, hay fever, teething discomfort, ring worm, burns /scalds). Thus, the selected 14 minor ailments that were used in the development of phase 2 questionnaire were constipation, cold/catarrh, hay fever, headache, teething discomfort, musculoskeletal pain, travel sickness, head lice, athlete foot, ring worm, sore throat, nappy rash, burns /scalds, and sun burn.

In phase 2 of the study, two hundred and eighty-two community pharmacists out of total of 307 sampled from the chain and independent pharmacies and invited to participate in the study responded and completed the questionnaires. Hence, the response and completion rates were 92% (282/307) and 100% (282/282) respectively.

The demographic profile of the community pharmacists sampled is as shown in Table 1. Majority of the respondents were males (68.1%, 192/282) and work in chain pharmacies (77.3%, 218/282). The most frequently encountered age group among the community pharmacists sampled was 31-40 years (55.3%, 156/282), followed by 21-30 years (35.8%, 101/282), 41-50 years (6.4%, 18/282), 51-60 years (1.8%, 5/282), and >60 (0.7%, 2/282) (Figure 4).



Gender Pharmacy Type Age Group

Figure 4. Distribution of respondents according to gender, pharmacy type and age group.

The (Median, IQR) of the years of experience of respondents was (7.00 [4.00, 10.00]). The most frequent nationality of the community pharmacists sampled was Indian (43.3%, 122/282), followed by Egyptian (35.1%, 99/282), Sudanese (8.9%, 25/282) and Filipino (7.4%, 21/282). BSc/BPharm was the highest degree in pharmacy for 81.6% (230/282) of the participants, while MSc Pharm, Diploma, and PharmD were (10.3%, 29/282), (4.6%, 13/282) and (3.5%, 10/282) respectively (Table 2).

Table 2. Demographic Profile of Community Pharmacists in Independent and Chain Community Pharmacies in Qatar (n=282)

Item	n (%)
Gender	
Male	192 (68.1)
Female	90 (31.9)
Age [years]	
21-30	101 (35.8)
31-40	156 (55.3)
41-50	18 (6.4)
51-60	5 (1.8)
>60	2 (0.7)
Nationality	
Indian	122 (43.3)
Pakistani	4 (1.4)
Egyptian	99 (35.1)
Syrian	4 (1.4)
Filipino	21 (7.4)
Palestinian	1 (0.4)
Jordanian	5 (1.8)
Sudanese	25 (8.9)
Canadian	1 (0.4)
Type of Community Pharmacy	
Independent	64 (22.7)
Chain	218 (77.3)
Experience in Years (Median [IQR])	7.00 [4.00, 10.00]
Highest Degree	
Diploma	13 (4.6)
BSc/BPharm	230 (81.6)
PharmD	10 (3.5)
MSc Pharm	29 (10.3)

Workload of the sampled community pharmacists is as shown in Table 3. Seventy one percent of community pharmacists (201/282) reported attending to more than 30 customers per daily shift. The most frequently reported number of customers with requests related to minor ailments attended to by community pharmacists per daily shift was 11 to 20 (28.4%, 80/282), followed by 21 to 30 customers (26.2%, 74/282), 1 to 10 (24.5%, 69/282), and greater than 30 (20.9%, 59/282). About half of the participants spent 5 to 10 minutes for consultation related to minor ailments (146/282) while 40% (113/282) spent less than 5 minutes. More than half of the surveyed pharmacists reported the lack of any existing documentation system related to the management of minor ailments (54.3%, 153/282) while relatively lower proportion of community pharmacists (45.7%, 129/282) reported the existence of documentation of some minor ailments-related activities conducted in community pharmacies.

Table 3. Community Pharmacists' Workload Related to Minor Ailments in Independent and Chain Pharmacies in Qatar (n=282)

Item	n (%)
Number of customers per daily shift	
1-10 Customers	3 (1.1)
11-20 Customers	21 (7.4)
21-30 Customers	57 (20.2)
>30 Customers	201 (71.3)
Number of minor ailment customers per daily shift	
1-10 Customers	69 (24.5)
11-20 Customers	80 (28.4)
21-30 Customers	74 (26.2)
>30 Customers	59 (20.9)
Consultation time for minor ailments	
≤5 mins	113 (40.1)
6-10 mins	146 (51.8)
11-15 mins	19 (6.7)
16-20 mins	4 (1.4)
Documentation of minor ailment management	
Yes	129 (45.7)
No	153 (54.3)

The information gathering practices related to the management of minor ailments by community pharmacists is as shown in Table 4. Community pharmacists reported that they always (75.9%, 214/282) or very often (15.6%, 44/282) confirm patient identity by asking for who the medication is for during minor ailment-related encounters, while information about patients' age is always or very often obtained in 72.3% (204/282) and 20.2% (57/282) respectively. Similarly, asking about how long symptoms related to minor ailments have persisted was always (70.2%, 198/282) or very often (19.1%,

54/282) done by community pharmacists. Unlike the 4 questionnaire items mentioned above, percentages less than 70% were reported as “Always” regarding asking about medical history, medication history, and allergy history. These were (51.8%, 146/282), (63.8%, 180/282), (48.2%, 136/282), respectively (Table 4). More than half of respondents reported that they “Sometimes” make a follow-up plan (51.1%, 140/282), and referral to physician (67.7%, 191/282) when necessary during the management of minor ailments.

Table 4. Information Gathering Practices of Community Pharmacists in Independent and Chain Pharmacies in Qatar (n=282)

Items	**Never n (%)**	**Rarely n (%)**	**Sometimes n (%)**	**Very Often n (%)**	**Always n (%)**
Customer’s identity	0.0 (0.0)	3 (1.1)	21 (7.4)	44 (15.6)	214 (75.9)
Customer’s age	0.0 (0.0)	4 (1.4)	17 (6.0)	57 (20.2)	204 (72.3)
Symptoms	0.0 (0.0)	5 (1.8)	14 (5.0)	41 (14.5)	222 (78.7)
Duration of symptoms	1 (0.4)	5 (1.8)	24 (8.5)	54 (19.1)	198 (70.2)
Medical history	0.0 (0.0)	7 (2.5)	52 (18.4)	77 (27.3)	146 (51.8)
Medication history	0.0 (0.0)	9 (3.2)	37 (13.1)	56 (19.9)	180 (63.8)
Allergy history	1 (0.4)	22 (7.8)	47 (16.7)	76 (27.0)	136 (48.2)
Follow-up during minor ailment management	4 (1.4)	20 (7.1)	144 (51.1)	65 (23.0)	49 (17.4)
Referral during minor ailment management	0.0 (0.0)	20 (7.1)	191 (67.7)	56 (19.9)	15 (5.3)

Table 5 presents the counseling practices of community pharmacists related to the management of minor ailments in Qatar. The vast majority of respondents always or very often provide information about drug dose (86.2%, 243/282), (12.8%, 36/282)

respectively. Similarly, most of the respondents always or very often provide information related to the frequency of medication administration (86.5, 244/282), (11.3%, 32/282), route of administration (81.9%, 231/282), (13.8%, 39/282), and duration of treatment (75.9%, 214/282), (17.4%, 49/282), On the other hand, a notably less percentage of respondents (less than the half) reported that they always provide information related to storage conditions (43.3%, 122/282), possible side effects (30.5%, 86/282), and possible contraindications (30.1%, 85/282). The decrease in "Always" responses in the last three items appeared telling.

Table 5. Counseling Practices of Community Pharmacists Related to Minor Ailments in Qatar (n=282)

Items	**Never n (%)**	**Rarely n (%)**	**Sometimes n (%)**	**Vert Often n (%)**	**Always n (%)**
Drug dose	0.0 (0.0)	1 (0.4)	2 (0.7)	36 (12.8)	243 (86.2)
Frequency of administration	0.0 (0.0)	0.0 (0.0)	6 (2.1)	32 (11.3)	244 (86.5)
Route of administration	0.0 (0.0)	1 (0.4)	11 (3.9)	39 (13.8)	231 (81.9)
Duration of treatment	0.0 (0.0)	1 (0.4)	18 (6.4)	49 (17.4)	214 (75.9)
Storage condition	1 (0.4)	9 (3.2)	64 (22.7)	86 (30.5)	122 (43.3)
Possible side effects	1 (0.4)	15 (5.3)	86 (30.5)	94 (33.3)	86 (30.5)
Possible contraindication	0.0 (0.0)	26 (9.2)	93 (33.0)	78 (27.7)	85 (30.1)
Possible drug interactions	0.0 (0.0)	21 (7.4)	100 (35.5)	78 (27.7)	83 (29.4)

Table 6 shows the median [IQR] of the competency scores for each of the 14 selected common minor ailments in Qatar. The median [IQR] of the 14 conditions ordered from

highest to lowest were: constipation (76.0 [65.0, 82.0]), cold / catarrh (75.0 [67.0, 82.0]), headache (74.0 [67.0, 81.0]), nappy rash (74.0 [65.0, 81.5]), sore throat (74.0 [65.0, 81.0]), head lice (74.0 [64.0, 82.0]), teething discomfort (72.0 [63.0, 80.0]), musculoskeletal pain (72.0 [62.0, 80.0]), sun burn (72.0 [61.0, 81.0]), hay Fever (71.0 [61.5, 80.0]), burns / scalds (71.0 [61.0, 79.5]), athlete foot (70.0 [59.0, 78.0]), travel sickness (69.0 [59.0, 78.0]), and ring worms (69.0 [56.0, 77.0]).

Table 6. Community Pharmacists' Self-Perceived Competency Score for Each of the 14 Selected Common Minor Ailments (Maximum Competency Score = 90)

Minor ailments	**Median [IQR]**
Constipation	76.0 [65.0, 82.0]
Cold /Catarrh	75.0 [67.0, 82.0]
Hay Fever	71.0 [61.5, 80.0]
Headache	74.0 [67.0, 81.0]
Teething Discomfort	72.0 [63.0, 80.0]
Musculo-Skeletal Pain	72.0 [62.0, 80.0]
Travel Sickness	69.0 [59.0, 78.0]
Head Lice	74.0 [64.0, 82.0]
Athlete Foot	70.0 [59.0, 78.0]
Ring Worm	69.0 [56.0, 77.0]
Sore Throat	74.0 [65.0, 81.0]
Nappy Rash	74.0 [65.0, 81.5]
Burns /Scalds	71.0 [61.0, 79.5]
Sun Burn	72.0 [61.0, 81,0]

Table 7 presents the competency score for each of the competence elements. The competency element with the highest score (median [IQR]) for the condition-specific elements was the ability to recommend appropriate OTC medicines for the management of the selected 14 minor ailments (117.0 [103.0, 129.0]), followed by ability to give full instructions on how to use the recommended OTC medicines (115.0 [103.0, 128.0]), being able to define/describe the minor ailments (115.0 [102.0, 126.0]), and determine when a referral is required (114.0 [101.0, 126.0]). The competency element with the lowest score for the condition-specific elements was the ability to differentiate signs and symptoms of minor ailments from other similar conditions (109.0 [96.0, 121.0]), followed by the ability to describe the etiology of the minor

ailment (112.0 [97.3, 122.8]), recognize the signs and symptoms of the minor ailment (112.0 [101.0, 126.0]), ability to recommend appropriate non-pharmacological advice (112.0 [97.0, 125.0]), and recognize considerations for special populations (112.0 [98.0, 126.0]). Median [IQR] for non-condition specific competency elements including the ability to follow up with patients who received advice, ability to document assessment, recommendations, and follow-up activities, and ability to retrieve disease and drug information from trusted sources in a timely manner were (7.0 [5.0, 9.0]), (7.0 [5.0, 9.0]), and (8.0 [7.0, 10.0]), respectively.

Table 7. Community Pharmacists' Self-Perceived Competency Elements Related to Minor Ailments (Max=140)

Components of minor ailment management	**Median [IQR]**
Description / definition of minor ailment (for 14 conditions)	115.0 [102.0, 126.0]
Etiology of minor ailment (for 14 conditions)	112.0 [97.3, 122.8]
Signs and symptoms (for 14 conditions)	112.0 [101.0, 126.0]
Differentiate minor ailments from similar conditions (for 14 conditions)	109.0 [96.0, 121.0]
Determine when referral is required (for 14 conditions)	114.0 [101.0, 126.0]
Recommend appropriate non-pharmacological advice (for 14 conditions)	112.0 [97.0, 125.0]
Recommend appropriate OTC medicines (for 14 conditions)	117.0 [103.0, 129.0]
Recognize considerations for special populations (for 14 conditions)	112.0 [98.0, 126.0]
Instruction on the use of recommended medicines (for 14 conditions)	115.0 [103.0, 128.0]
Follow-up with patients (non-condition specific)	7.0 [5.0, 9.0]
Document assessment, recommendations, and follow-up activities (non-condition specific)	7.0 [5.0, 9.0]
Check and retrieve relevant disease or drug information (non-condition specific)	8.0 [7.0, 10.0]

The female group (87/282) showed statistically significant higher competency scores than the male group (186/282) in 11 out of the 14 selected common minor ailments (p

<0.05) (all the 14 minor ailments except musculoskeletal pain, travel sickness, and ring worm) (Table 8).

Table 8. Comparison of Self-perceived Competency Score for Each Minor Ailment Between the Two Gender Groups (Males and Females)

Minor ailments	**Gender**		
	Male	**Female**	
	n=192	**n=90**	
	Median Competency Score	**Median Competency Score**	**P-Value**
Constipation	73.5	78.0	0.014*
Cold /Catarrh	73.0	78.0	0.017*
Hay Fever	70.0	74.0	0.023*
Headache	72.5	77.0	0.029*
Teething Discomfort	71.0	76.0	0.001*
Musculo-Skeletal Pain	72.0	73.0	0.208
Travel Sickness	68.5	71.0	0.126
Head Lice	72.0	79.0	0.002*
Athlete Foot	68.5	72.0	0.022*
Ring Worm	67.0	72.0	0.109
Sore Throat	72.0	78.0	0.005*
Nappy Rash	72.0	78.0	0.003*
Burns /Scalds	69.0	74.0	0.003*
Sun Burn	70.0	76.0	0.002*

Note: Mann Whitney U test was applied

* p <0.05 (difference is statistically significant)

Table 9 shows the comparison between community pharmacists working in independent and chain pharmacies regarding their self-reported competency scores for each of the 14 selected minor ailments. Community pharmacists working in chain pharmacies had statistically significant higher competency scores for the 14 selected minor ailments compared to those working in independent pharmacies.

Table 9. Comparison of Self-perceived Competency Score for Each Minor Ailment Between the Two Types of Community Pharmacies (Independent and Chain)

Minor ailments	**Community Pharmacy Type**		
	independent n=64	**chain n=218**	
	Median	**Median**	**P-Value**
Constipation	68.0	77.0	0.000*
Cold /Catarrh	71.0	76.0	0.003*
Hay Fever	64.0	72.0	0.000*
Headache	71.0	76.0	0.001*
Teething Discomfort	64.0	73.0	0.000*
Musculo-Skeletal Pain	68.0	73.0	0.001*
Travel Sickness	61.0	71.0	0.001*
Head Lice	69.0	75.0	0.000*
Athlete Foot	62.0	70.5	0.000*
Ring Worm	59.0	70.0	0.000*
Sore Throat	69.0	76.0	0.000*
Nappy Rash	70.0	75.0	0.001*
Burns /Scalds	63.0	72.0	0.001*
Sun Burn	64.0	74.0	0.000*

Note: Mann Whitney U test was applied

* $p < 0.05$ (difference is statistically significant)

Analysis of the association of the highest pharmacy degree with self-perceived competency to manage the 14 selected minor ailments showed statistically significant difference between the different groups (Diploma, BSc/BPharm, PharmD, MScPharm) for the competency scores ($p < 0.05$, Kruskal Wallis test) (Table 10). Post-hoc pairwise comparisons revealed that the median competency score for the BSc/BPharm group was statistically significantly higher than PharmD and MSc Pharm groups for all 14 minor ailments ($p < 0.05$) (Table 10).

Table 10. Comparison of Self-perceived Competency Score for Each Minor Ailment across Highest Pharmacy Degrees (BSc/BPharm, PharmD, Postgraduate Diploma, MScPharm)

Minor ailments	Highest degree of education				Post-hoc pairwise comparisons						
	BSc/BPharm n=230 Group 1	PharmD n=10 Group 2	Postgraduate Diploma n=13 Group 3	MScPharm n=29 Group 4							
	Median	Median	Median	Median	P-Value	1-2	1-3	1-4	2-3	2-4	3-4
Constipation	77.0	67.0	65.0	70.0	0.001*	0.026*	0.156	0.001*	0.455	0.896	0.429
Cold /Catarrh	77.0	63.5	68.0	70.5	0.001*	0.009*	0.337	0.001*	0.177	0.665	0.224
Hay Fever	72.0	53.5	63.0	68.0	0.010*	0.017*	0.368	0.014*	0.222	0.451	0.482
Headache	75.0	56.0	67.0	70.0	0.000*	0.007*	0.414	0.001*	0.125	0.598	0.179
Teething Discomfort	73.0	55.5	62.0	70.0	0.017*	0.054	0.184	0.015*	0.560	0.715	0.742
Musculo-Skeletal Pain	73.0	51.5	65.0	71.0	0.026*	0.026*	0.328	0.038*	0.293	0.407	0.683
Travel Sickness	70.0	46.0	58.0	68.5	0.007*	0.006*	0.343	0.031*	0.138	0.210	0.627
Head Lice	75.0	66.0	61.0	70.5	0.011*	0.147	0.095	0.006*	0.985	0.820	0.821
Athlete Foot	71.0	61.0	58.0	69.0	0.017*	0.040*	0.162	0.022*	0.528	0.575	0.861
Ring Worm	70.0	50.5	58.0	68.0	0.074	0.082	0.285	0.058	0.540	0.621	0.821
Sore Throat	76.0	58.5	62.0	70.0	0.011*	0.032*	0.226	0.012*	0.410	0.611	0.634
Nappy Rash	75.0	71.0	62.0	70.0	0.012*	0.286	0.047*	0.007*	0.599	0.602	0.931
Burns /Scalds	72.0	50.0	61.0	68.0	0.009*	0.033*	0.125	0.012*	0.549	0.614	0.843
Sun Burn	74.0	70.5	64.0	68.0	0.014*	0.182	0.108	0.006*	0.949	0.741	0.777

Note: Kruskal-Wallis test was applied

* p <0.05 (difference is statistically significant)

The result of the Spearman rank's correlation analysis of the association between the median self-perceived competency score for each of the 14 minor ailments and the median information gathering score showed that there was a positive, weak but statistically significant correlation ($p < 0.05$) (Table 11).

Table 11. Correlation Between Self-Perceived Competency Score for Each Minor Ailment and Information Gathering Score

Minor ailments	Competency score of each minor ailment Median [IQR]	Information gathering score Median [IQR]	Spearman rank's correlation coefficient	p-value
Constipation	76.0 [65.0, 82.0]	33.0 [29.0,35.0]	0.303	0.000*
Cold /Catarrh	75.0 [67.0, 82.0]	33.0 [29.0,35.0]	0.279	0.000*
Hay Fever	71.0 [61.5, 80.0]	33.0 [29.0,35.0]	0.307	0.000*
Headache	74.0 [67.0, 81.0]	33.0 [29.0,35.0]	0.278	0.000*
Teething Discomfort	72.0 [63.0, 80.0]	33.0 [29.0,35.0]	0.296	0.000*
Musculo-Skeletal Pain	72.0 [62.0, 80.0]	33.0 [29.0,35.0]	0.276	0.000*
Travel Sickness	69.0 [59.0, 78.0]	33.0 [29.0,35.0]	0.327	0.000*
Head Lice	74.0 [64.0, 82.0]	33.0 [29.0,35.0]	0.308	0.000*
Athlete Foot	70.0 [59.0, 78.0]	33.0 [29.0,35.0]	0.328	0.000*
Ring Worm	69.0 [56.0, 77.0]	33.0 [29.0,35.0]	0.338	0.000*
Sore Throat	74.0 [65.0, 81.0]	33.0 [29.0,35.0]	0.279	0.000*
Nappy Rash	74.0 [65.0, 81.5]	33.0 [29.0,35.0]	0.285	0.000*
Burns /Scalds	71.0 [61.0, 79.5]	33.0 [29.0,35.0]	0.303	0.000*
Sun Burn	72.0 [61.0, 81,0]	33.0 [29.0,35.0]	0.248	0.000*

* $p < 0.05$ (statistically significant p-value)

Similarly, Spearman rank's correlation analysis of the association between median self-perceived competency scores to manage the 14 selected common minor ailments in Qatar and median scores for counseling practices showed a positive, weak, but statistically significant correlation ($p < 0.05$) (Table 12).

Table 12. Correlation Between Community Pharmacists' Self-Perceived Competency to Manage Selected Minor Ailments and Counseling Practice

Minor ailments	Competency score of each minor ailment Median [IQR]	Counseling practice score Median [IQR]	Spearman rank's correlation coefficient	p-value
Constipation	76.0 [65.0, 82.0]	35.0 [32.0,38.0]	0.213	0.000*
Cold /Catarrh	75.0 [67.0, 82.0]	35.0 [32.0,38.0]	0.177	0.003*
Hay Fever	71.0 [61.5, 80.0]	35.0 [32.0,38.0]	0.208	0.001*
Headache	74.0 [67.0, 81.0]	35.0 [32.0,38.0]	0.193	0.001*
Teething Discomfort	72.0 [63.0, 80.0]	35.0 [32.0,38.0]	0.209	0.001*
Musculo-Skeletal Pain	72.0 [62.0, 80.0]	35.0 [32.0,38.0]	0.191	0.001*
Travel Sickness	69.0 [59.0, 78.0]	35.0 [32.0,38.0]	0.272	0.000*
Head Lice	74.0 [64.0, 82.0]	35.0 [32.0,38.0]	0.213	0.000*
Athlete Foot	70.0 [59.0, 78.0]	35.0 [32.0,38.0]	0.235	0.000*
Ring Worm	69.0 [56.0, 77.0]	35.0 [32.0,38.0]	0.276	0.000*
Sore Throat	74.0 [65.0, 81.0]	35.0 [32.0,38.0]	0.158	0.009*
Nappy Rash	74.0 [65.0, 81.5]	35.0 [32.0,38.0]	0.157	0.009*
Burns /Scalds	71.0 [61.0, 79.5]	35.0 [32.0,38.0]	0.196	0.001*
Sun Burn	72.0 [61.0, 81,0]	35.0 [32.0,38.0]	0.162	0.007*

* $p < 0.05$ (statistically significant p-value)

The result of binary logistic regression analysis which was focused on identifying the most significant predictors of community pharmacists' self-perceived competency to manage the 14 selected minor ailments is as shown in Table 13. The tested possible predictors were gender (males and females), age (below or equal to 40 years and above 40 years), type of community pharmacy (independent and chain), nationality (Arabs and Non-Arabs), highest pharmacy degree (BSc/BPharm and Non-BSc/BPharm), number of customers seen during daily shift (below or equal to 30 and above 30),

number of minor ailment customers (below or equal to 20 and above 20), years of experience as a community pharmacist, total information gathering score, and total counselling practice score. The binary logistic regression results showed that the most significant predictors were female gender ($p = 0.003$), working in chain community pharmacies ($p = 0.006$) and counseling practice ($p = 0.046$). Female community pharmacists are 2.4 times more likely to report total competency score ≥ 1032 (meet expectation) than male community pharmacists ($p < 0.05$).

Community pharmacists working in chains are 2.5 times more likely to report total competency score ≥ 1032 (meet expectation) than those working in independent community pharmacies, while those with each increased unit in their total counselling practice score will have 1.1 times increase in the odds that their total competency score is ≥ 1032 ($p < 0.05$).

Table 13. Binary Logistic Regression Analysis of the Predictors of Community Pharmacists' Self-Perceived Competency to Manage Selected Minor Ailments

		Competency score						95% CI for Exp(B)		
Items	**Categories**	**<1032 n**	**≥1032 n**	**B**	**SE**	**Wald**	**Exp(B)**	**Lower**	**Upper**	**P-value**
Gender	Male (n=192)	110	82				1(reference)			
	Female (n=90)	32	58	0.87	0.30	8.67	2.39	1.34	4.25	0.003*
Age groups	≤40 (n=257)	132	125				1(reference)			
	>40 (n=25)	10	15	0.63	0.63	1.01	1.88	0.55	6.40	0.314
Type of CP	Independent (n=64)	47	17				1(reference)			
	Chain (n=218)	95	123	0.93	0.34	7.51	2.54	1.31	4.96	0.006*
Nationality	Arabs (n=134)	72	62				1(reference)			
	Non-Arabs (n=148)	70	78	0.20	0.28	0.51	1.22	0.71	2.11	0.475
Highest degree of pharmacy education	BSc/BPharm (n=228)	106	122				1(reference)			
	Non-BSc/BPharm (n=54)	36	18	-0.56	0.35	2.54	0.57	0.29	1.14	0.111
No. of customers per daily shift	≤30 (n=81)	47	34				1(reference)			
	>30 (n=201)	95	106	0.36	0.34	1.11	1.44	0.73	2.81	0.293
No. of minor ailment customers per daily shift	≤20 (n=149)	83	66				1(reference)			
	>20 (n=133)	59	74	0.24	0.31	0.60	1.27	0.70	2.31	0.438
Experience (years)				0.00	0.03	0.00	1.00	0.94	1.06	0.994
Total information gathering score				0.06	0.04	2.29	1.06	0.98	1.14	0.130

Table 13. (continued)

Items	Categories	Competency score <1032 n	Competency score ≥1032 n	B	SE	Wald	Exp(B)	95% CI for Exp(B) Lower	95% CI for Exp(B) Upper	P-value
Total counselling practice score				0.08	0.04	3.97	1.08	1.00	1.17	0.046*
Constant				-5.95	1.38	18.69	0.00			0.000*

Note: 1032 is 80% cutoff point of the total competency score (maximum value is 1290).

B=Coefficient; SE=Standard Error; Exp(B)=Exponentiation of coefficient; CI=Confidence Interval

*** p <0.05 (statistically significant p-value)**

The median [IQR] scores for community pharmacists' self-perceived enablers of and barriers to the management of minor ailments as shown in Table 14. The study results showed that 3 items had the median scores less than 8 (i.e., perceived as barriers). These are: the existence of sufficient private or semi/private space for patient counselling in the community pharmacy; previous researchers approached the pharmacist to assess his/her opinion and practice on community pharmacists' role expansion such as providing services other than dispensing medications to the customers; results and recommendations of previous research assessing the community pharmacists' role expansion were received by community pharmacist.

Table 14. Community Pharmacists' Self-Perceived Enablers of and Barriers to Manage Selected Minor Ailments (n = 282)

No.	Questionnaire items	Median [IQR]
1	Majority of the customers coming to me, show their trust in my knowledge by asking for my advice regarding minor ailment conditions and/or other conditions.	8.0 [8.0, 9.0]
2	I think that emergency physicians and primary healthcare physicians will admire and support the community pharmacists expanded roles such as providing consultations for minor ailment conditions.	8.0 [6.0, 9.0]
3	I think that the current healthcare system in Qatar focuses on maximizing the contribution of community pharmacists.	8.0 [6.0, 9.0]
4	My undergraduate pharmacy education trained me to be able to provide professional minor ailment services.	8.0 [7.0, 9.0]
5	Updating the existing pharmacy school courses will better allow graduates to provide professional minor ailment services.	9.0 [7.0, 10.0]
6	The existing continuous professional development program help me to provide professional minor ailment services.	8.0 [7.0, 10.0]
7	Tailored training programs on community pharmacy-based minor ailment services will allow me to provide professional minor ailment services.	8.0 [7.0, 10.0]
8	I am receiving enough training programs to help me provide professional minor ailment services from my employers.	8.0 [7.0, 9.0]
9	The overall existing layout and settings of community pharmacies allow me to provide professional minor ailment services.	8.0 [7.0, 9.0]
10	There are sufficient drug information and pharmacotherapy resources (electronic sources or online access or textbooks) in my community pharmacy that will help me as a scientific reference.	8.0 [7.0, 9.3]
11	There is a sufficient private or semi/private space for patient counselling in my community pharmacy.	7.0* [5.0, 9.0]
12	The workload and staff distribution on each working shift, allow me to provide professional minor ailment services without negatively affecting my sales volume and other duties.	8.0 [6.0, 9.0]

Table 14. (continued)

No.	Questionnaire items	Median [IQR]
13	The managers of my community pharmacy are interested in developing the way the community pharmacists deliver their services and the quality of giving consultations.	9.0 [7.0, 10.0]
14	I think the existing community pharmacy-related national regulations and policies help me provide professional community pharmacy-based minor ailment services.	8.0 [7.0, 9.0]
15	Previous researchers approached me to assess my opinion and practice on community pharmacists' role expansion such as providing services other than dispensing medications to the customers.	7.0* [4.0, 9.0]
16	Results and recommendations of previous research assessing the community pharmacists' role expansion were efficiently distributed so that I received any.	7.0* [3.0, 8.0]
17	I believe a well-designed research, with efficient distribution of results and recommendations on minor ailments services can change and improve the existing practice and allow the delivery of professional minor ailment services.	9.0 [7.0, 10.0]

* Items with median scores less than 8 were considered barriers, while those with median scores equal to or greater than 8 were considered enablers

The result of binary logistic regression analysis focused on identifying the most significant predictors of community pharmacists' self-perceived enablers of and barriers to manage the 14 selected minor ailments in Qatar is as shown in Table 15. The tested predictors were: gender (males and females), age (below or equal to 40 years and above 40 years), type of community pharmacy (independent and chain), nationality (Arabs and Non-Arabs), highest degree of pharmacy education (BSc/BPharm and Non-BSc/BPharm), number of customers seen during daily shift (below or equal to 30 and above 30), number of minor ailment customers (below or equal to 20 and above 20), years of experience as a community pharmacist, total information gathering score, and total counselling practice score. The binary logistic regression results showed that female community pharmacists are 2.2 times more likely to have their total enabling

score ≥ 136 than male community pharmacists ($p < 0.05$).

Community pharmacists aged ≤40 years are 4.7 times more likely to have their total enabling score ≥ 136 than those aged >40 years ($p < 0.05$).

With each increased unit in the total counselling practice score, there will be 1.1 times increase in the odds that the total enabling score is ≥136 ($p < 0.05$).

Table 15. Binary Logistic Regression Analysis of the Predictors of Community Pharmacists' Self-Perceived Enablers of and Barriers to Manage Selected Minor Ailments

		Enabler/Barrier score						95% CI for Exp(B)		
Items	**Categories**	**<136 n**	**≥ 136 n**	**B**	**SE**	**Wald**	**Exp(B)**	**Lower**	**Upper**	**P-value**
Gender	Male (n=192)	112	80				1 (reference)			
	Female (n=90)	37	53	0.79	0.29	7.36	2.21	1.25	3.91	0.007*
Age groups	≤40 (n=257)	131	126				1 (reference)			
	>40 (n=25)	18	7	-1.54	0.65	5.57	0.22	0.06	0.77	0.018*
Type of CP	Independent (n=64)	44	20				1 (reference)			
	Chain (n=218)	105	113	0.44	0.33	1.73	1.55	0.81	2.98	0.189
Nationality	Arabs (n=134)	67	67				1 (reference)			
	Non-Arabs (n=148)	82	66	-0.28	0.28	1.05	0.75	0.44	1.30	0.306
Highest degree of pharmacy education	BSc/BPharm (n=228)	112	116				1 (reference)			
	Non-BSc/BPharm (n=54)	37	17	-0.63	0.35	3.29	0.53	0.27	1.05	0.070
No. of customers per daily shift	≤30 (n=81)	49	32				1 (reference)			
	>30 (n=201)	100	101	0.42	0.34	1.48	1.52	0.77	2.98	0.224
No. of minor ailment customers per daily shift	≤20 (n=149)	84	65				1 (reference)			
	>20 (n=133)	65	68	-0.06	0.30	0.04	0.94	0.52	1.70	0.837

Table 15. (continued)

		Enabler/Barrier score						95% CI for Exp(B)		
Items	**Categories**	**<136 n**	**≥ 136 n**	**B**	**SE**	**Wald**	**Exp(B)**	**Lower**	**Upper**	**P-value**
Experience (years)				0.05	0.03	2.25	1.05	0.99	1.11	0.134
Total information gathering score				0.07	0.04	3.07	1.07	0.99	1.15	0.080
Total counselling practice score				0.08	0.04	4.07	1.08	1.00	1.17	0.044*
Constant				-5.75	1.36	17.77	0.00			0.000*

Note: 136 is the 80% cutoff point of the maximum score of 170. Above or equal to 136 = Enabler, whereas below 136 = Barrier.

B=Coefficient; SE=Standard Error; Exp(B)=Exponentiation of coefficient; CI=Confidence Interval

*** p <0.05 (statistically significant p-value)**

Chapter 5: Discussion and Conclusion

Discussion

The findings indicated that the majority of community pharmacists were males (68.1%), work in chain pharmacies (77%), were aged less than or equal to 40 years (91%), were mainly foreign nationals and had BSc/BPharm as their highest degree in pharmacy (81.6%) are unsurprising and consistent with trends in the Gulf countries of the Middle East (149). This is probably related to varieties of factors including the cultural practice of the separation of gender which may limit the presence of females in jobs like that of a community pharmacist that involve regular interpersonal contacts during minor ailment-related encounters. Furthermore, it is also probable that human resource management practices, especially recruitment and selection, in the chain pharmacies sector may have also accounted for the higher proportion of adult male-expatriates with BSc/BPharm degree. In addition, probable preference of Qatari citizens for pharmacy career options other than those in the community pharmacy sector may also be contributory to the demographic trends observed in the current study. This may have some policy implications as Qatar National Government may be tempted not to invest as much efforts and resources in interventional policies focused on the transformation of the community pharmacy sector due to the disproportionate presence of expatriates rather than Qatari citizens that constitute just about 10 percent of the population in Qatar (150). Notwithstanding, the community pharmacy sector remain a key focus of the aggressive efforts to transform the public health care system in Qatar, and this is focused on delivering a functional integrated health care service that meets patient needs at their doorsteps as enshrined in the Qatar National Health Strategy (30). Above half of the participants reported spending 5 to 10 minutes with customers during the management of minor ailments while forty percent reported spending 5 minutes or

less. These findings seem inconsistent with those reported by studies in other developing settings that reported an average consultation time of less than or equal to 2 minutes (151–154). This short consultation time may not be sufficient to gather appropriate patient history information that can help the community pharmacists accurately assess patients' health complaints, correctly diagnose minor ailments and recommend the most appropriate pharmacological and / or non-pharmacological advice to patients.

More than half of the study participants reported the lack of an existing documentation system for the community pharmacists' activities related to the management of minor ailments. This finding is consistent with that of Chui and Li (2005) who reported that community pharmacists in Singapore did not record any advice given to customers with minor ailments, while only about 18% documented the referral they made to physicians (155).

These findings suggest an inadequate documentation of the services provided by community pharmacist that are related to the management of minor ailments in developing settings. The existence and use a functional documentation system may contribute to better organization and monitoring of the community pharmacists' management of minor ailments, and better tracking of patients' follow-up treatment success and referrals made. In addition, such a documentation system may also enhance better communication with other healthcare professionals such physicians, and this may potentially improve patient safety (156).

The findings of the current study showed that the majority of community pharmacists reported that they ask questions related to patients' identity, age, and symptoms and duration at relatively high frequencies as opposed to medical history, medication history, and allergy history. This suggests that community pharmacists do not

consistently ask some of the important information gathering questions during the management of minor ailments, and this could probably compromise the quality-of-service delivery and outcome of care. These findings are consistent with that of a similar study done in Singapore (155) where community pharmacists reported that their gathering of patient information such as signs and symptoms duration, patient identity, and age was relatively higher than that of medical and medication history. Similarly, the findings of the current study is also consistent with that reported by a previous simulated patient study in Qatar by Izham et al., that showed that community pharmacists who provided advice for acute gastroenteritis scenario did not ask any question related to medical history (151). Furthermore, our study findings are also consistent with that of Mesquita et. al. (2013) (152) who reported that community pharmacists in Brazil obtained information about signs and symptoms, allergy history and medical history in 53%, 20.8% and 70.8% of encounters respectively during the management of headache and childhood diarrhea. Findings from other developing countries such as Jordan (153) and India (154) showed that information gathering by community pharmacists was found to be poor. Therefore, there is a clear need for appropriate intervention to correct the observed inadequacy and inconsistency in the information gathering practices of community pharmacists. These could include the use of relevant professional development programs to expand community pharmacists' information gathering skills and the development and use of a minor ailment-specific protocol that may serve as a guide and reminder to community pharmacists regarding the relevant information that must be obtained and used for therapeutic planning during minor ailment-related encounters with patients. The benchmarks developed by international organizations such as the World Health Organization (WHO) and International Pharmaceutical Federation (FIP) could be used as a template for the

development of such a protocol (4). Furthermore, about half of the participants reported that they "Sometimes" follow up with patients regarding the outcomes of recommendations made during previous minor ailment encounters or make referrals to physicians, but this was not accompanied by any form of documentation. This is unsurprising and probably underscores the importance of the availability and use of a standard protocol to guide community pharmacists' activities during the management of minor ailments.

Community pharmacists appeared not to be providing counselling information in a consistent and adequate manner as information such as drug dose, frequency, route of administration, and duration of treatment were more frequently provided relative to storage conditions, possible side effects, and possible contraindications. This finding is similar to that of Chui and Li (2005) (155) who reported that 97.7% of community pharmacists often provide information on how to use medications properly, while a relatively less percentage (72.7%) provided counseling information about possible side effects. Additionally, Mesquita et al (2013) (152) showed that information about possible drug interactions, adverse reactions and what should be done in case of missed doses were less frequently provided by community pharmacists during minor ailment encounters. Similarly, Izham et al., reported poor counseling practices by the community pharmacists in Qatar as only about 33% of the study participants provided information about medicines name, indication, dosage, and route of administration while information on side effects or allergies were not provided. Results of the current study are also in agreement with those of a previous review of community pharmacists' counseling practices which showed that providing information on directions of usage, drug name, dose, and indications, were reported in higher frequencies relative to those on side effects, contraindications, storage, interactions and precautions (157).

Therefore, there is a clear gap in the quality of counseling information provided by community pharmacists, and this could potentially compromise patient outcomes and expose patients to harm.

The result of community pharmacists' self-perceived competency to manage minor ailments showed that the condition-specific competency elements with the highest median scores were being able to recommend appropriate OTC medicines for the 14 selected common minor ailments; give full instructions on how to use the recommended medicines; define/describe minor ailments; and to determine when a referral is required (median scores were 117, 115, 115, and 114 respectively). On the contrary, the perceived ability to differentiate signs and symptoms of minor ailments from similar conditions, identify the etiology, recognize signs and symptoms, recommend appropriate non-pharmacological advice, and recognize considerations for special populations were the elements with lowest median scores (median scores were 109, 112, 112, 112, and 112 respectively). The relatively lower self-perceived scores given to recommending non-pharmacological advice in the current study as opposed to focusing on recommending pharmacological treatment is in agreement with the results from Hassell et. al. (1998) and Inch et.al. (2017) (158,159). Similar to these findings, a Brazilian study (152) reported that non-pharmacological advice was provided to only 25% of simulated patients with childhood diarrhea. The seemingly disproportionate recommendation of pharmacological treatments for minor ailments by community pharmacists, relative to non-pharmacological advice could be attributed to the business-oriented nature of community pharmacy practice, which may increase the temptation to focus solely on increasing sales.

Community pharmacists in the current study reported high self-perceived competency to recommend appropriate OTC medications for minor ailments. However, findings

from previous studies in other developing countries suggest that community pharmacists do not consistently provide appropriate pharmacological treatments for the management of minor ailments, and this may be attributable to factors such as inadequate information gathering and/or non-compliance to recommended treatment guidelines (151,153,154). This is a probable focus for further research.

Findings from the current study suggest a weak, positive, statistically significant association between the information gathering score and the overall competency score, and a similar correlation was observed between counselling practice score and the overall competency score. These findings underscore the critical importance of information gathering and counseling and its potential contribution to community pharmacists' self-perceived competency to manage minor ailments effectively. Therefore, a system that regularly tracks and identifies probable gaps in community pharmacists' information gathering and counseling practices is crucial to maintain expected standards in service delivery. This could be achieved with a standard protocol that could be used as a monitoring and evaluation tool. Furthermore, the observed weak statistical association between community pharmacists' information gathering and counseling practice and self-perceived competency appeared to suggest that the observed inadequacy in information gathering and counseling practice might not necessarily be underlined by competency deficits. Perhaps, other factors that are system or work-related may be underlying the observed inconsistency or inadequacy (160–162).

For instance, lack of access to patients' medical records may hinder the ability of community pharmacists to gather relevant information that are crucial to providing appropriate treatments. This assertion is consistent with the findings of Selvaraj et. al. (163) that showed that community pharmacists identified lack of patients' information

as the main barrier to provide minor ailment services effectively in Malaysia.

The findings of the current study about non-condition-specific competency elements such as community pharmacists' perceived competence to follow up with patients, document activities related to the management of minor ailment and retrieve disease and drug information from trusted sources in a timely manner appeared adequate.

Female community pharmacists and respondents who work in chain community pharmacies showed higher self-perceived competency scores than males and those working in independent pharmacies, respectively. For example, female community pharmacists were 2.4 times more likely to report competency scores that meet expectation (≥ 1032) than male community pharmacists while participants who work for chain pharmacy were 2.5 times more likely to report competency scores that meet expectation than those working in independent community pharmacies. The difference due to gender is consistent with the findings of Mills et.al. (164) who reported that gender is the biggest influencer for the self-assessed competency in the favor of females. Mills et. al. also concluded that working in chain pharmacy and being younger in age is associated with higher self-perceived competency. A possible explanation for this observation is that female community pharmacists have higher job satisfaction compared to males and therefore are probably more likely to report higher perceived self-efficacy in the completion tasks that are related to their core competence (165–167). The significantly higher self-perceived competency scores observed among community pharmacists working for chain pharmacies may be explained by organizational policy and practice such the existence and use of standard operating procedure and exposure to regular training program focused on continuous expansion of skills required for the effective management of minor ailments. In addition, the availability of onboarding programs for newly employed community pharmacists

which involves educating them about the minimum practice standards that are expected of all employees may have been contributory (162,168).

The finding of the current study showed that the self-perceived competency scores for the community pharmacists with the BSc/BPharm degree was significantly higher relative to those with PharmD and MScPharm degrees. This finding appears to suggest that the possession of a postgraduate qualification may not necessarily affect community pharmacists' self-perceived competency to manage minor ailments. These findings are similar to the results of Mills et. al. (164) who reported that community pharmacists with postgraduate qualifications reported lower competency scores than those without postgraduate qualifications. Factors related to the characteristics of the postgraduate qualifications such as where it was obtained, its quality, and taught content might have affected the self-perceived competency level. It is not readily clear why postgraduate qualifications appeared not have positively affected community pharmacists' self-perceived competency scores and this is a good focus for further research. However, results from a study in the UK (169) showed that pharmacists stated that they mainly acquired their knowledge through practical dispensing experiences rather than formal undergraduate or postgraduate training. Therefore, practical experience seems to have more impact on the level of knowledge of some community pharmacists as opposed to postgraduate training.

The findings of the current study about the perceived enablers of and barriers to management of minor ailments by community pharmacists showed that respondents perceived that customers trust their knowledge and advice regarding minor ailment as an enabler. This is unsurprising as societal trust and confidence is crucial to successful delivery of a professional service such as the management of minor ailment (170,171). Customer will accept and follow the treatment recommendations and counseling

provided only if they trust the judgment, skills, and competencies of the community pharmacists. Our finding is inconsistent with that of a pilot study in Qatar (172) which reported that the public did not have a good understanding of the role of community pharmacists in providing drug-related information, and about two third of the interviewed patients said they did not have sufficient time to discuss their complaints with community pharmacists.

Community pharmacists identified the support of emergency and primary care physicians as a crucial enabler of the possible ceding of the responsibility of managing minor ailments to community pharmacists in Qatar". This finding is consistent with that of several studies that have reported that physicians generally support the community assumption of the role of managing minor ailments (61,70) as this will enable stronger focus of health care resources on more serious medical conditions, reduce patients load and waiting time in hospitals and improve efficiency in service delivery (56–59). However, the finding of our study contradicts that of Selvaraj el. al. (163) who identified lack of support from other health care professionals as one of the most important perceived barriers by community pharmacists to the provision of minor ailment services in Malaysia.

The current study showed that community pharmacists identified existing regulations that govern the pharmacy profession in Qatar as a factor that enable their management of minor ailments. This finding is unsurprising and probably related to the prominent role carved out for community pharmacists in the Qatar National Health Strategy that is focused on provision of a functional integrated health care service that meet patients' needs and is delivered at their doorstep (173,174). Hence, our finding suggests that community pharmacists do not perceive the existing regulations as a potential barrier to introduce minor ailment services. This finding is similar to that of Selvaraj et. al.

(163) who attributed the positive perception and attitude of Malaysian community pharmacists towards minor ailment services to the compliance to the national code of conduct and pharmacy regulations.

The results of this study also showed that community pharmacists perceived their undergraduate pharmacy training and exposure to continuous professional development as enablers of their ability to manage minor ailments effectively. These findings suggest that community pharmacists in Qatar find that their undergraduate pharmacy education and regular attendance of continuous professional development provided them the essential competencies needed to manage minor ailments. These findings are similar to that of Selvaraj et. al. who reported that the Malaysian undergraduate pharmacy education was not perceived as a barrier to introducing minor ailment services because it appropriately covered essential competency related to minor ailments management, communication skills, and basic education on policies and code of conduct. These findings appear to emphasize the importance of the relationship between education and pharmacy practice.

The findings of the study suggest that three major factors were perceived by community pharmacists as barriers to their effective management of minor ailments. These include lack of sufficient private or semi/private space for patient counselling in the community pharmacy; lack of invitations to participate in research related to community pharmacists' role expansion such as provision of services other than dispensing medications to the customers and non-receipt of results and recommendations of previous research assessing the community pharmacists' role expansion. These findings suggest that research still has a big room for improvement to be perceived as an active enabler in the mind of community pharmacists.

The current study showed that gender appeared to be a significant determinant of

community pharmacists' perception of factors that enable their assumption of the role of managing minor ailments as female community pharmacists had twice the odds of perceiving enablers relative to males ($p < 0.05$). It is not readily what factor may be underlining the female community pharmacists better perception of enablers rather than barriers but a possible explanation is that female pharmacists have better job-related experience such as job satisfaction and probable lower exposure to job stress and role overload compared to male community pharmacists (165–167).

Furthermore, age group was identified as a significant determinant of perception of enablers of community pharmacists' capacity to manage minor ailments in Qatar. This is because community pharmacists in the age group ≤ 40 years were 4.7 times more likely to perceive enablers rather that barriers to the readiness to assume the responsibility of managing minor ailments. This finding probably suggest that community pharmacists in the younger age group have higher levels of motivation and enthusiasm to provide minor ailment service compared to older ones (175), and this may have accounted for the better attitudes towards the management of minor ailments (163).

Study Strengths and Limitations:

The current study had many strengths. To begin with, this is the first study in developing settings to investigate community pharmacists' self-perceived competency related to the management of minor ailments, and the self-perceived enablers and barriers. In addition, the study identified the most significant determinants of community pharmacists' self-perceived competency, and that of the enablers, and barriers. The developing countries, including Qatar, currently lack a set of specific competency standards required for the management of minor ailments by community pharmacists. Hence, the findings of this study may potentially contribute to the development of the

pharmacy practice through the articulation of the competency elements needed for the effective and safe management of minor ailments (9 conditions-specific and 3 non-condition specific competency elements). These competency elements were obtained with the use of a newly developed data collection tool (the questionnaire). Furthermore, the study surveyed community pharmacists regarding their competencies for managing a wide range of the most relevant minor ailments encountered in Qatar. The 14 selected minor ailments outnumber, by far, the range of minor ailments used in any previous published study in the in the research area. Therefore, the current study provides baseline data that could be potentially useful in designing interventions aimed at improving community pharmacists' competency to manage minor ailments effectively, and overcoming any possible barriers .

However, the study has few limitations. Firstly, the study is cross-sectional, and a non-probability sampling method was used. Hence, its findings are applicable to the period of data collection and may not be generalizable to other periods or populations. However, the sampling distribution of the study participants mirrors the actual proportional representation of community pharmacists in Qatar. Secondly, this was a questionnaire-based survey and community pharmacists who accepted to participate may have been more motivated than those who refused, and this could have influenced the responses. In addition, social desirability bias may have influenced the community pharmacists' responses, as this was a questionnaire-based study. However, the high internal consistency of the data collection tool and the similarity of the trends in the study findings with those reported by previous studies is noteworthy, and probably suggest that the findings of the current study are valid. In addition, social desirability bias appeared not to have affected the relatively lower frequencies reported by community pharmacists for a considerable number of items.

The use of simulated patients for data collection may have reduce the risk of social desirability bias and improve validity. However, simulated patient method does not necessarily guarantee a valid response as respondents' behavior or activity may be confounded by other factors. For example, the fact that a community pharmacist does not gather information on allergy or medication history does not necessarily suggest competency deficits as such an observation may have been underlined by other factors such role overload, job dissatisfaction or organizational policy that is more profit- rather than patient-oriented. In addition, the use of simulated patient method is usually more appropriate for studies involving few targeted medical conditions and seems impractical for the current study that involved 14 different minor ailments.

Study contributions:

The current study provided valuable insights on the current state of community pharmacists' perceived competency, enablers, and barriers towards managing selected minor ailments in Qatar. Hence, the study findings are potentially useful for developing and implementing models of community pharmacy-based minor ailment services in Qatar that comply with accepted standards of service delivery and can effectively contribute to the realization of the health-related goals of the Qatar National Health Strategy (2018-2022) and Qatar National Vision (2030). The new tool developed and used for the study provided a recommended set of competency elements that can be used in future intervention studies in the research area.

This study can serve as a strong foundation upon which the design and development of standardized community pharmacy-based minor ailment management guidelines and protocols, as well as tailored skill-based training programs targeting community pharmacists, can be built. Effective dissemination of the study results and recommendations to key stakeholders and decision makers (including regulators and

health-policy makers, senior management of community pharmacies, researchers, and pharmacy school(s)) will, hopefully, encourage the development and use of an institutionalized standards to guide the provision of community pharmacy-based minor ailment services in Qatar. The study revealed the competency elements that community pharmacists felt they master the best as well as those they felt they possess to a less extent. Similarly, pharmacists felt more competent in managing some minor ailments relative to others. The study identified community pharmacists' self-perceived barriers and enablers towards managing minor ailments in Qatar, and these could be useful in developing evidence-based interventions targeted to reinforce the enablers and overcome the barriers to the effective and safe management of minor ailments by community pharmacists in Qatar (84,176,177).

Future recommendations

Future studies are needed to further explore factors affecting community pharmacists' self-perceived competency and to examine the relationship between the self-perceived and the actual competence during the management of minor ailments. Triangulation using other methods to assess community pharmacists' real-life practice regarding the management of minor ailments and identify the underpinning factors, may build on the findings of the current study. Furthermore, developing professional interventions based on the adapted conceptual framework, that considers the 5 interacting forces (general environmental factors, education/training, regulation, research, and practice) is warranted to build a successful minor ailment scheme. For example, interventions focused on training / education can be tested to evaluate its impact on community pharmacists' competency and as a potential enabler to providing minor ailment services. Similarly, interventions focused on policies, improving public trust in community pharmacists, and improving the current design and layout of community

pharmacies can be studied as potential enablers.

Conclusion

Community pharmacists in Qatar reported that they undertake essential tasks such as information gathering, appropriate counselling, and recommendation of medications for customers during the management of minor ailments. However, some of these tasks were not done adequately or consistently and this may affect the quality of the pharmacological and non-pharmacological advice provided. Overall, community pharmacists reported high self-perceived competency scores. The top 3 minor ailments with the highest median scores were constipation, cold/ catarrh, and headache, while athlete foot, travel sickness, and ring worms had the lowest median scores. The three competency elements with the highest median scores include the ability to recommend appropriate OTC medicines and give full instructions on usage; and the ability to define/describe the selected 14 minor ailments. The competency elements with the lowest median scores were that ability to recognize the signs and symptoms of the 14 selected minor ailments; recommend appropriate non-pharmacological advice; and recognize considerations for special populations. Female gender, working in chain community pharmacies, and counselling practice were the most significant predictors of community pharmacists' self-perceived competency to manage selected commonly encountered minor ailments in Qatar.

The factors identified as enablers of community pharmacists' management of minor ailments in Qatar include customers' trust in community pharmacists' knowledge; perceived physicians' support to community pharmacists' role expansion; perceived focus of the Qatari healthcare system on maximizing the contribution of community pharmacists; undergraduate pharmacy education the pharmacists received; updating the existing pharmacy school courses to better enable graduates to provide minor ailment services; the existing continuous professional development program; tailored training programs focused on providing minor ailment services; enough training programs from

employers; overall existing layout and settings of the community pharmacy; sufficient drug information and pharmacotherapy resources accessible in community pharmacy; the current workload and staff distribution; interest of community pharmacy managers in developing the service delivery; existing community pharmacy-related national regulations and policies; a well-designed research with effective distribution of results, while lack of private/semi-private space for counselling the patients; not being approached to participate in research focused on assessment of community pharmacists' opinion on role expansion; and not receiving the results of previous research investigating community pharmacists' role expansion were the self-perceived barriers identified. Female gender, community pharmacists aged ≤ 40 years, and counseling practice were the significant predictors of community pharmacists' perception of enablers and barriers, respectively.

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Appendix A: QU-IRB Ethics Approval

جامعة قطر
QATAR UNIVERSITY

Qatar University Institutional Review Board
QU-IRB

May 01, 2019

Dr. Mohamed Izham Ibrahim
Graduate Student Supervisor
College of Pharmacy
Qatar University
Tel.: 4403-5580
Email: mohamedizham@qu.edu.qa

Dear Dr. Mohamed Izham,

Sub.: Research Ethics Review Exemption / CPH Graduate Student Project
Ref.: Student, Ahmed M.A. Makhlouf / Email: am1606080@student.qu.edu.qa
Project Title, "Expansion of community pharmacists' capacity to deliver effective minor ailment services in Qatar: Impact assessment of a professional training program"

We would like to inform you that your application along with the supporting documents provided for the above graduate student project, has been reviewed by the QU-IRB, and having met all the requirements, has been granted research ethics **Exemption** based on the following category(ies) listed in the Policies, Regulations and Guideline provided by MoPH for Research Involving Human Subjects:

Category 4: Research and demonstration projects which are designed to study, evaluate, or otherwise examine:
(i) Public benefit or service programs;
(ii) procedures for obtaining benefits or services under those programs;
(iii) possible changes in or alternatives to those programs or procedures; or
(iv) possible changes in levels of payment for benefits or services under those programs

Documents reviewed: QU-IRB Checklist(S1), QU-IRB Application(FS), MI Student Grant, Consent (FS), Questionnaire, IRB review form, responses to IRB queries and updated documents.

Please note that exempted projects do not require renewals however, any changes/modifications to the original submitted protocol should be reported to the committee to seek approval prior to continuation.

Your Research Ethics Approval No. is: **QU-IRB 1074-E/19**
Kindly refer to this number in all your future correspondence pertaining to this project. In addition, please submit a closure report to QU-IRB upon completion of the project.

Best wishes,

Dr. Noora Lari
pp Chairperson, QU-IRB

Institutional Review Board
(IRB)
Office Of Academic Research

Appendix B: Sample QU Support Letter

كلية الصيدلة
College of Pharmacy
QATAR UNIVERSITY جامعة قطر
Member of HEALTH الصحة عضو في

26 May, 2019

The Chain Pharmacy Leader
Kulud
Doha, Qatar

Dear Sir / Madam,

REQUEST FOR YOUR KIND SUPPORT AND PARTICIPATION IN A POSTGRADUATE RESEARCH

The bearer, Mr. Ahmed Mohamed Ashraf Makhlouf, is a postgraduate student of the College of Pharmacy, Qatar University. He is currently working on a Master of Science (MSc) in Pharmacy research that is focused essentially on the baseline assessment of the capacity of community pharmacists to provide effective minor ailment services in Qatar. The strategic goal of the research is to, on completion, develop a functional framework that can be used to expand the capacity of community pharmacists to effectively manage minor ailments and contribute meaningfully to the improvement of patient outcomes at the individual and societal levels in Qatar.

He has chosen your reputable organization as one of the key participants in the research and therefore request your kind support and cooperation to successfully complete the research.

We look forward to your kind support and active participation.

كلية الصيدلة College of Pharmacy جامعة قطر QATAR UNIVERSITY

Sincerely,

Kazeem Babatunde Yusuff, PhD
Associate Professor
College of Pharmacy
Qatar University
P.O Box 2713
Doha, Qatar
Tel: +9744035641

Ahmed Mohamed Ashraf Makhlouf
MSc student, Clinical Pharmacy and Practice
College of Pharmacy
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Doha, Qatar
Email: am1606080@qu.edu.qa
Mob.: 0097430604024

Appendix C: Consent Form

Consent Form

Title: Community Pharmacists' self-perceived competencies and influencers towards providing minor ailment services in Qatar (A self-administered questionnaire).

Dear Participant:

This questionnaire is an attempt to investigate how you think about your capability of providing some structured and standardized services to your patients who may suffer from a selected list of minor ailment conditions. Additionally, it aims to identify how you think about the possible barriers and enablers that can influence the provision of such services. Your input is an essential element in this study and will be kept **strictly confidential**. This information will be used for research purposes only. Of course, your participation is **voluntary**. If you decide to participate, you will be asked to answer questions exploring your current practice and perceptions. You can skip any question or withdraw from participation at any time. The survey will take approximately **30 minutes** from your valuable time. We appreciate your time and effort. If you have any questions about this study, please feel free to contact me at am1606080@qu.edu.qa, mobile no: (00974) 30604024.

Sincerely,

Ahmed Makhlouf,
MSc student at College of Pharmacy, Qatar University.

I have read the above statements and have been fully informed of the procedures to be used in this project
I have been given sufficient opportunity to ask any questions I had concerning the procedures and possible risks involved. I understand the potential risks involved and I assume them voluntarily. I likewise understand that I can withdraw from the study at any time without being subjected to reproach.

I agree to the Audio/Video recording of my interview Yes / No

_____ _____
Signature of Participant Date

_____ _____
Name & Signature of Researcher Date

Appendix D: The Questionnaire

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Ministry of HEALTH الصحة وزارة

Section A: Demographics

Question	Kindly, respond to the following questions by placing a check mark (✓) in the check box of the appropriate response option:
1-Please indicate your gender:	☐ Male ☐ Female
2-Please, check the category which best describes your age group:	☐ 21-30 years ☐ 31-40 years ☐ 41-50 years ☐ 51-60 years ☐ > 60 years
3-Please, check your nationality:	☐ Indian ☐ Pakistani ☐ Egyptian ☐ Syrian ☐ Filipino ☐ Palestinian ☐ Jordanian ☐ Sudanese ☐ Iraqi ☐ Tunisian ☐ American ☐ Canadian ☐ Others (Please Specify: ----------)

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Question	
4-What type of community pharmacy do you work in?	☐ Independent (Single) private pharmacy ☐ Chain Pharmacy (please mention the chain name: ----------)
5-Please, specify your overall work experiecne as a community pharmacist (in years):	My work experience as a pharmacist is ..... Years.
6-Please, check the country from which you obtained your first professional pharmacy degree?	☐ India ☐ Pakistan ☐ Egypt ☐ Syria ☐ Philipinnes ☐ Palestine ☐ Jordan ☐ Sudan ☐ Iraq ☐ Tunisia ☐ America ☐ Canada ☐ Others (Please Specify: ----------)
7-Please, check your highest degree in pharmacy	☐ Diploma in Pharmacy ☐ BPharm / BSc Pharm ☐ PharmD ☐ MSc Pharm ☐ PhD Pharm ☐ Others (Please Specify: ----------)

End of Section A

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Section B: Pharmacist Workload & Current Counseling Practices

Question	Kindly, respond to the following questions by placing a check mark (✓) in the check box of the appropriate response option:
1-The average number of customers who approach you in your daily shift is:	☐ 1-10 customers ☐ 11-20 customers ☐ 21-30 customers ☐ > 30 customers
2-Of all the customers who approach you in your daily shift, the average number of customers who ask for advice on self- medication for a minor ailment is:	☐ 1-10 customers ☐ 11-20 customers ☐ 21-30 customers ☐ > 30 customer
3-How frequently do you make a follow up plan (e.g. ask the customer to see you again after a determined period of time) after each counseling given to your customers ?	☐ Always ☐ Very Often ☐ Sometimes ☐ Rarely ☐ Never

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4-How frequently do you ask each one of the following questions when a customer requests a specific medication or advice on self-medication for a minor ailment?					
4.1-Who is taking the medication?	☐ Always	☐ Very Often	☐ Sometimes	☐ Rarely	☐ Never
4.2-How old is the patient using the drug?	☐ Always	☐ Very Often	☐ Sometimes	☐ Rarely	☐ Never
4.3-What are the patient's symptoms?	☐ Always	☐ Very Often	☐ Sometimes	☐ Rarely	☐ Never
4.4-Is the patient's currently on any other medication?	☐ Always	☐ Very Often	☐ Sometimes	☐ Rarely	☐ Never
4.5-For how long the symptoms have been present?	☐ Always	☐ Very Often	☐ Sometimes	☐ Rarely	☐ Never

Question					
4.6-Does the patient have history of any medical condition?	☐ Always	☐ Very Often	☐ Sometimes	☐ Rarely	☐ Never
4.7-Does the patient have any drug/food allergy?	☐ Always	☐ Very Often	☐ Sometimes	☐ Rarely	☐ Never

5- How frequently do you offer each one of the following information when a customer requests a specific medication, or advice on self-medication, for a minor ailment?					
5.1-Drug dose	☐ Always	☐ Very Often	☐ Sometimes	☐ Rarely	☐ Never
5.2-Frequency of administration	☐ Always	☐ Very Often	☐ Sometimes	☐ Rarely	☐ Never

Question					
5.3-Route of administration	☐ Always	☐ Very Often	☐ Sometimes	☐ Rarely	☐ Never
5.4-Duration of treatment	☐ Always	☐ Very Often	☐ Sometimes	☐ Rarely	☐ Never
5.5-Storage conditions	☐ Always	☐ Very Often	☐ Sometimes	☐ Rarely	☐ Never
5.6-Possible side effects	☐ Always	☐ Very Often	☐ Sometimes	☐ Rarely	☐ Never
5.7-Possible drug contraindications	☐ Always	☐ Very Often	☐ Sometimes	☐ Rarely	☐ Never

Question					
5.8-Possible drug interactions	☐ Always	☐ Very Often	☐ Sometimes	☐ Rarely	☐ Never

Question					
6-How frequently do you refer your customers with minor ailments to a physician?	☐ Always	☐ Very Often	☐ Sometimes	☐ Rarely	☐ Never
7-The time you spend with each customer giving him/her consultation is averagely:	☐ ≤ 5 mins	☐ 6-10 mins	☐ 11-15 mins	☐ ≥ 16 mins	

Question		
8-In your community pharmacy, is there a standard documentation system that captures ANY of the services that are provided to customers such as: patient assessment, treatment options, counseling, referral to physicians, follow up with patients, and other possible pharmacist interventions?	☐ Yes	☐ No

End of Section B

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Section C: Community Pharmacists' Self-Perceived Competence to Provide Minor Ailment Services

Competency is defined as: A cluster of related abilities, commitments, knowledge, and skills that enable a person (or an organization) to act effectively in a job or situation.

On a scale from 0 to 10, (0= Not competent at all, 1= I have very low competency, to 10= I am fully competent), please write a number from 0 to 10 inside each check box to indicate how competent do you think you are regarding each of the following minor ailments:

Guiding Example:

Question	Constipation	Cold & Influenza	Hay fever (Seasonal Allergic Rhinitis)	Pain Relief	Teething in Children	Musculo-Skeletal Pain (Strains, Sprains, & Bruises)	Travel Sickness	Head Lice	Athlete's Foot	Ringworm	Sore Throat	Nappy Rash (Diaper rash)	Burns & Scalds	Sunburn
1- I am competent to define/describe the condition:	8	3	1	9	6	5	2	3	2	4	8	6	2	0

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Question	Constipation	Cold & Influenza	Hay fever (Seasonal Allergic Rhinitis)	Pain Relief	Teething in Children	Musculo-Skeletal Pain (Strains, Sprains, & Bruises)	Travel Sickness	Head Lice	Athlete's Foot	Ringworm	Sore Throat	Nappy Rash (Diaper rash)	Burns & Scalds	Sunburn
1- I am competent to define/describe the condition.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
2- I am competent to describe the etiology (causes) of the condition.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
3- I am competent to recognize the signs & symptoms of the condition.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
4- I am competent to distinguish the signs & symptoms of the condition from other similar conditions.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Question	Constipation	Cold & Influenza	Hay fever (Seasonal Allergic Rhinitis)	Pain Relief	Teething in Children	Musculo-Skeletal Pain (Strains, Sprains, & Bruises)	Travel Sickness	Head Lice	Athlete's Foot	Ringworm	Sore Throat	Nappy Rash (Diaper rash)	Burns & Scalds	Sunburn
5- I am competent to recognize when a referral of the patient, with the condition, to a physician should be made by the pharmacist, based on: **A)** The severity of the condition/Presence of alarm (danger) symptoms. **B)** Patient characteristics (age, gender, pregnancy, lactation). **C)** Presence of significant concomitant diseases.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
6- I am competent to identify and recommend the appropriate non-pharmacological treatment/life-style advice , for the condition, when relevant.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
7- I am competent to identify and recommend the appropriate over-the-counter drug option(s), for the condition, when relevant.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Question	Constipation	Cold & Influenza	Hay fever (Seasonal Allergic Rhinitis)	Pain Relief	Teething in Children	Musculo-Skeletal Pain (Strains, Sprains, & Bruises)	Travel Sickness	Head Lice	Athlete's Foot	Ringworm	Sore Throat	Nappy Rash (Diaper rash)	Burns & Scalds	Sunburn
8- I am competent to recognize special population considerations (children, pregnancy and lactation status, elderly patients), when considering the non-pharmacological and the pharmacological treatment options for the condition, when relevant.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
9- I am competent to provide detailed, clear instructions to the patient on ALL of the following: duration of treatment, prescribed quantity, frequency of usage, how to use, possible side effects, when to follow up with me, when to stop taking the medication, and when to go to a physician, for the condition.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Question	On a scale from 0 to 10, (0= Not competent at all, 1= I have very low Competency, to 10= I am fully competent), please write a number from 0 to 10 inside each check box to indicate how competent do you think you are regarding each of the following questions:
10- I am competent to follow-up with the patient (by phone call or setting a future appointment in the pharmacy) to assess the effectiveness & safety of my recommended medications.	☐
11- I am competent to document my assessment, recommendations, and follow up plan, for each patient having the condition, if I have the proper documentation form(s).	☐
12- During my working hours, I am competent to check and retrieve relevant information through instant access to ANY of the following: online websites, text books, and databases of pharmacotherapy and drug information.	☐

End of Section C

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Section D: Community Pharmacists' Self-Perceived Barriers and Enablers to Provide Minor Ailment Services

	Question	On a scale from 0 to 10, (0= I fully disagree, to 10= I fully agree), please write a number from 0 to 10 inside each check box to to indicate how much do you agree on the following statements describing possible influencers of providing minor ailment services:
Sub-Section D1: General Influencers	1.1- The majority of the customers coming to me, show their trust in my knowledge by asking for my advice regarding minor ailment conditions and/or other conditions.	☐
	1.2-I think that emergency physicians and primary healthcare physicians will admire and support the community pharmacists expanded roles such as providing consultations for minor ailment conditions.	☐
	1.3- I think that the current healthcare system in Qatar focuses on maximizing the contribution of community pharmacists.	☐
Sub-Section D2: Education and Training	2.1-My undergraduate pharmacy education trained me to be able to provide professional minor ailment services.	☐
	2.2-Updating the existing pharmacy school courses will better allow graduates to provide professional minor ailment services.	☐

	Question	
Sub-Section D2: Education and Training	2.3-The existing continuous professional development program help me to provide professional minor ailment services.	☐
	2.4-Tailored training programs on community pharmacy-based minor ailment services will allow me provide professional minor ailment services.	☐
	2.5- I am receiving enough training programs to help me provide professional minor ailment services from my employers.	☐
Sub-Section D3: Community Pharmacy Practice	3.1-The overall existing layout and settings of community pharmacies allow me to provide professional minor ailment services.	☐
	3.2-There are sufficient drug information and pharmacotherapy resources (electronic sources or online access or text books) in my community pharmacy that will help me as a scientific reference.	☐
	3.3-There is a sufficient private or semi/private space for patient counselling in my community pharmacy.	☐
	3.4-The workload and staff distribution on each working shift, allow me to provide professional minor ailment services without negatively affecting my sales volume and other duties.	☐

	Question	
Sub-Section D3:	3.5-The managers of my community pharmacy are interested in developing the way the community pharmacists deliver their services and the quality of giving consultations.	☐
Sub-Section D4: Regulators:	4.1-I think the existing community pharmacy-related national regulations and policies help me provide professional community pharmacy-based minor ailment services.	☐
	4.2-If you have any comments or recommendations for community pharmacy national regulators and policy makers that can help provide or improve minor ailment services, please specify here:	

	Question	
Sub-Section D5: Research	5.1-Previous researchers approached me to assess my opinion and practice on community pharmacists' role expansion such as providing services other than dispensing medications to the customers.	☐
	5.2-Results and recommendations of previous researches assessing the community pharmacists' role expansion were efficiently distributed so that I received any.	☐
	5.3-I believe a well-designed research, with efficient distribution of results and recommendations on minor ailments services can change and improve the existing practice and allow the delivery of professional minor ailment services.	☐

End of Questionnaire