QATAR UNIVERSITY

COLLEGE OF HEALTH SCIENCES

THE ROLE OF QATAR COMMUNITY PHARMACISTS IN DEPRESSION CARE: A SURVEY OF ATTITUDES, PRACTICES AND PERCEIVED BARRIERS

BY

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ABSTRACT

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Title: The Role of Qatar Community Pharmacists in Depression Care: A Survey of Attitudes, Practices and Percieved Barriers

Supervisors of Thesis: Dr Mohammad Fasihul-Alam and Dr Maguy El-Hajj.

Background**:** Negative attitudes and stigma are considered to be major barriers to healthcare and quality of life around the world for patients with depression. Community pharmacists are one of the most accessible healthcare providers. They can enhance patients' adherence to antidepressant regimens through counselling on depression and antidepressant medications, as well as the provision of adequate follow up and medication management.

Aim: Our study aims to describe the current practices, attitudes and perceived barriers of Qatar community pharmacists in relation to the provision of depression care.

Methods: This is a cross-sectional online survey targeting all practicing community pharmacists in Qatar using an adapted survey instrument. Responses were measured on a 5-point-Likert scale. Study outcomes were scores of attitudes to depression, scores of self-reported depression care practices and the number of perceived barriers. These scores were produced by summing the individual scores of a set of survey items under the domain used to assess each outcome. Descriptive analyses of pharmacists' responses were done using means and standard deviations for continuous variables, and frequency tables for categorical variables. Bivariate and multivariate regression analyses were also employed to investigate how pharmacists' characteristics and attitude affected their practice. Statistical analysis was conducted using STATA version 15.1 and assigned a p-value of 0.05 for statistical significance.

Results: The survey had a response rate of 39%. Pharmacists' attitudes to depression were moderately positive. Out of a possible score of 5, the mean score of attitudes was 3.41, with a standard deviation of 0.94. However, the extent of pharmacists' involvement in depression care was very low. Out of a possible score of 5, pharmacists' practices had a mean score of 2.64 and a standard deviation of 0.26. The top three reported barriers were the lack of access to patients' medical records (83.21%), lack of patients' insight on major depression and the importance of treatment (81.85%) and the lack of needed knowledge and training on mental health (79.63%), respectively. Female pharmacists were significantly less involved in depression care compared to male pharmacists (p= 0.006). Depression practice score increased with an increasing score of attitudes (p =0.001), and decreased with the number of years since the last pharmacy degree graduation (p=0.02).The presence of a private area for counselling patients was associated with higher scores of practice (p=0.03). Pharmacists' practice scores varied across types of pharmacy setting, where pharmacists who worked in pharmacies located in shopping malls and supermarkets showed the highest scores of practice compared to community pharmacies of private hospitals (p=0.05).

Conclusion: Pharmacists' moderately positive attitudes towards depression and its care were not reflected in their current practices. A set of perceived barriers against the provision of depression care were also identified in this study. Results from this study could serve as an evidence base for future longitudinal studies in Qatar, implying a need for the development of local depression care and training programs for pharmacists to improve their knowledge and improve their attitude towards depression care.

DEDICATION

I dedicate this thesis to my dearest children Jad, Selena and Dana.

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LIST OF ABBREVIATIONS

Abbreviation	Meaning
CHD	Coronary Heart Disease
PHQ	Patient Health Questionnaire
NICE	National Institute for Health and Care Excellence
APA	American Psychiatric Association
mhGAP	The mental health Gap Action Programme
WHO	World Health Organization
KSA	Kingdom of Saudi Arabia
PHCC	Qatar Primary Health Care Corporation
MoPH	Ministry of Public Health
DAQ	Depression Attitude Questionnaire
CVD	Cardiovascular Disease
R-DAQ	Revised Depression Attitude Questionnaire
CSM	Common Sense Model
TPB	Theory of Planned Behavior
MCAR	Missing Completely at Random
QU IRB	Qatar University Institutional Review Board
MUR	Medication Utilization Review
MTM	Medication Therapy Management
QCHP	Qatar Council of Healthcare Practitioners

CHAPTER 1: INTRODUCTION

1.1 Depression and its burden:

Mental disorders contribute to 14% of the global burden of diseases, of which depression is considered the most common type (1). Data from the World Health Organization (WHO) indicates that in 2015, 4.4% of the global population suffered from depression and the prevalence was higher in females (5.1%) than males (3.6%) (2).Unmet mental health need is a global challenge, as there is a documented gap between the need for treatment and its provision worldwide (3). As a result, depression remains to be a main contributor to mortality, (4-6) and a leading cause of disability worldwide (7). It is also a leading cause of exacerbation of other mental health problems, such as anxiety disorders, and physical health problems like coronary heart disease (CHD) (4-6). Studies have shown that major depression was associated with exacerbations and poorer outcomes of CHD, independently from its established risk factors like hypertension, diabetes mellitus and smoking (4-6). Depression has a strong effect on different aspects of a person's life if remained undiagnosed (3, 8). Undiagnosed depression was found to be significantly correlated with psychological stress and drug use, which add social costs that could be higher than of $100,000 per quality-adjusted-life year QALY (9). Several economic costs of having depression have also been listed in literature, such as higher need for medical care, lower quality of life, and lower productivity at workplace(8).

"Major depressive disorder", commonly referred to as "Depression" , is a common mental disorder characterized by a set of symptoms that persist for not less than two weeks, and mainly include sadness ,loss of interest in activities a person normally enjoys, and inability to perform daily activities. Depression is caused by

complex interactions occurring between psychological, biological and social factors. The effect of such interactions can be higher in presence of life events such as stressful experiences during childhood or loss of employment (10). In terms of depression assessment, several effective screening tools were described in literature, such as Beck Depression Inventory, two-item or nine-item Physician Health Questionnaire PHQ-2 and PHQ-9 (11). As for treatment of depression, the main interventions are cognitive behavioral therapy, brief psychotherapy and antidepressant medications, or any combination of these interventions depending on depression severity level ,the number of previous episodes and the previous response to a certain intervention (12, 13). Clinical guidelines for the treatment of major depression from The National Institute for Health and Care Excellence (NICE) recommend that antidepressants need to be taken for at least 3 to 4 weeks before ascertaining their efficacy. They also emphasize that treatment needs to be continued for at least 8 months after symptom remission in order to prevent relapse (13).The American Psychiatric Association (APA) guidelines indicate that 4–8 weeks of treatment are needed before making conclusions about patient's responsiveness to antidepressant treatment (12). However, the low adherence to medical treatment of depression was found to be an area of concern, and a main cause of high relapse rates in patients who were initiated on antidepressant medications(5) .

A review of community-based psychiatric studies found that the median rates of depression cases which remained untreated was 56.3% ,and represented a treatment gap that is almost twice the gap in treatment of schizophrenia and other affective disorders (32.2%)(14) . As a result, several mental health programs have been conducted worldwide, where major depression was set in the core of their defined priorities. The mental health Gap Action Programme (mhGAP) developed by WHO

has emphasized the importance of the role of non-specialist health care providers, being part of the "the first-level facilities" which included general practitioners, nurses, pharmacists, community officers and midwives. It produced evidence-based guidance to enable them to better identify and manage depression (15, 16) .Qatar has seen a high increase in psychiatric morbidity (17), and a high prevalence of depression in primary health care setting (4). Strategies have been set to direct efforts towards increasing the delivery of healthcare for mental health in primary care and community settings. Hamad Medical Corporation (HMC) has established a number of community-based facilities, in order to expand community-based mental health services. At national level, goals have also been set to act against stigma towards mental health by creating community awareness on depression as a disease that can be treated, increasing the availability of high-quality services, and improving skills of mental health care providers (3). In that regards, HMC mental health services started providing continuing education in the field of mental health to non-specialized healthcare professionals (18).

1.2 Community pharmacists' role within primary healthcare:

Found within the primary care, community pharmacy, also referred to as retail or private pharmacy sector, is a collective form of pharmacy practice that is centered within a community (19). In addition to their traditional role of medication dispensing, pharmacists practicing in community pharmacies can play a major role in health promotion and disease prevention (20), being the most accessible healthcare professionals whenever a patient seeks advice on health and self-care in general (16). Their role has been described to be multifaceted, and it has been evident that community pharmacists play varied roles. They are involved in the management of asthma, arthritis, osteoporosis ,cardiovascular diseases, diabetes, , hypertension, depression, and palliative care either alone or as part of a disease management

team(21). However, available data on the practice of those roles is suspected to vary significantly across countries, and is confounded by the fact that most of the relevant literature is available mainly from the UK and USA (22, 23). A set of new extended practice roles changed the focus of community pharmacy practice from being task-oriented ; i.e., limited to medication dispensing, to a more patient-oriented profession that involves providing care, advice ,counseling and medication management (24).

1.3 Pharmacy practice in Qatar:

In Qatar, healthcare services are provided to all nationals and residents by a mix of public, private, and semi-governmental institutions. However, the public sector, as represented by HMC and PHCC remains to be the main healthcare provider in Qatar (25) . Health care provision by these two institutions has seen rapid expansion in the past years , specifically in relation to primary care services (25). There are approximately 2500 practicing pharmacists in Qatar. Around 1200 of these pharmacists work in community and outpatient hospital pharmacies of the private sector, while the remaining number work as either clinical pharmacists or outpatient ambulatory pharmacists in public primary health care centers and public hospitals(26). Both community and clinical pharmacists work under the umbrella of the Ministry of Public Health MoPH .All Qatar pharmacists are required to pass an initial examination in order to attain a practice license from Qatar Council of Healthcare Practitioners. They also need to attend a defined number of continuous professional development CDP activities annually in order to have their practice license renewed (27).

In the community and ambulatory pharmacy sectors, practice is predominantly limited to dispensing of medications and pharmaceutical products (28). In Qatar, it is quite uncommon that pharmacists who work in this sector actively deliver pharmaceutical care, do medication therapy management or provide other extended

cognitive services. Qatar, as well as some other countries in the Gulf region, have developed several programs to enable community pharmacists to undertake extended counselling roles (20, 29, 30).

The public hospital pharmacy sector currently provides ward-based clinical pharmacy services where, in addition to the standard inpatient and outpatient drug-dispensing services, clinical pharmacists are exposed to an extensive level of patient-centered professional practice and they are part of a multidisciplinary team. However, those clinical pharmacy services were only recently introduced and are limited to only some units of public hospitals intensive care, pediatrics, and oncology and, most recently, psychiatry units. Clinical pharmacists working in HMC Rumaila Hospital, which is the specialized public mental health hospital, play a set of defined roles with respect to mental health care. They participate clinical rounds, carry out psychotropic medication optimization, monitor medication safety as well as provide mental patients with education about their prescribed psychotropic medication regimens. (28, 31, 32).

CHAPTER 2: LITERATURE REVIEW

2.1 Adherence to antidepressant medications:

Low adherence to prescribed antidepressant regimens has always been mentioned as an area of concern that adversely affects depression treatment. Furthermore, depression itself is considered a significant risk factor for noncompliance to medication (33). A meta-analysis conducted by Dimatteo et al. that investigated the relationship between depression and adherence to treatment. It concluded that regardless of what medication was used; depressed patients were three times less likely to comply with treatment recommendations compared with non -depressed patients (34) . Literature has also shown that adherence to antidepressants and reduction of relapse required a combination of adequate treatment duration, realistic patient expectations, and use of the right dose of a drug that can act on a wide range of symptoms while maintaining a proper control of adverse effects (35).

The reported relapse rate in patients prescribed antidepressants was as high as 80%, which is attributed to several factors, and one of those major factors was in-adherence to treatment (36). A study in the United States of America (USA) showed that patients with depression had high rates of relapse when up to 33% of them discontinued treatment within the first 30 days and 40 % of them within 90 days of antidepressant initiation (35, 37) .

Patients reported a set of reasons or patient factors that may cause early discontinuation of antidepressants. These factors ranged between patients' perceptions that symptoms of depression were eradicated, beliefs that medications were no more needed and doubts about medication efficacy and safety (33, 38). The latter antidepressant medication-related issues such as adverse effects and delayed onset of action can cause patients to prematurely drop the prescribed medication (39). On the

other hand, several psychosocial issues may lower levels of adherence as well as limit the provision of care (40, 41). Negative attitudes, misunderstanding, stigma and discrimination were shown to be major barriers to healthcare and quality of life around the world for people with depression. A national survey of 1300 patients with mental disorders in the USA revealed that patients suffered from high levels of stigmatizing behavior from society, and most importantly from their healthcare providers (42). More than half of the respondents reported being offered discouraging advice and being treated with rejection from their health care provider (42). Other studies also showed that such negative attitudes of healthcare providers towards patients might eventually lead to failure in seeking treatment and support when the patient's depression symptoms arise, and also indicate a suboptimal use of their prescribed medications (3, 5, 35).

2.2 Depression and low adherence to treatment in primary care:

In this context of depression and low adherence to treatment, it would be important to look at the case of the primary care sector, which is the main provider of healthcare services for patients with depression. Evidence from the literature suggests that most patients with mild to moderate depression receive their diagnoses and treatments from primary care physicians, with less need for referral to specialist care (4, 5, 43-45). In 2018, a study conducted in Germany investigated the health utilization patterns (rates of attendance, diagnoses, prescription and hospitalization) of patients with ICD-10 codes F45.0-F45 as defined by "Pain disorder with related psychological factors". It concluded that patients with chronic diseases and those who suffer from depression were frequent or very frequent attenders in both in primary care and out-of-hours health care at significantly higher rates compared to the general study population who did not have the F45- diagnoses (45). The rates of attendances per 100 patients were 39.5 and 24.6 respectively. Additionally, this group of patients was shown to

suffer from major depression, but that usually remained under-reported (45).Moreover, general practitioners were described as gate-keepers of the specialized health care, and that might possibly make them lack enough time to offer appropriate disease counselling medication and management to their patients (17, 36, 46) .

Within the primary healthcare setting, in-adherence to antidepressant medications was described as being caused by either the patient factors, as described in the previous section or by healthcare provider factors (33). Several provider factors were reported in the literature such as lack of the needed knowledge of depression ,suboptimal antidepressant dosing, lack of adequate information delivered to patients about their depression and antidepressant medication , lack of follow- up and monitoring of treatment efficacy, in addition to the provider's low willingness to treat depression, or to monitor the medication's effectiveness (33). Consequently, it was estimated that more than 80% of patients who were prescribed an antidepressant by a general practitioner reported not to receive the proper follow-up and monitoring of drug efficacy and safety (36, 46, 47).

Thus, a major issue to consider is to what extent patients with depression are being offered the needed support, and whether they are being adequately educated on the importance of adhering to their prescribed antidepressant regimen. In this context, NICE guidelines for the treatment of severe depression emphasized collaborative patient-centered care which includes medication management as well as regular liaison with primary and secondary care practitioners (13). A systematic review of randomized controlled trials between 1982 and 2006 found conclusive evidence that changing systems of care delivery can improve the effectiveness of depression management in primary care (5). As per 2018 Australian and New Zealand guidelines on treatment of depression, in all patients who are diagnosed with moderate to severe depression, who

were initiated on antidepressants , and specifically those who did not respond fully to antidepressant medication , reviewing the diagnosis and confirming treatment adherence are highly warranted (48).

2.2 Evidence on the role of the community pharmacist in depression care:

The role of community pharmacists in mental health support service, specifically with respect to medication counselling and management, has been demonstrated in several studies in the literature (33, 49-55). Of note that such roles were also clearly defined by The American Society of Healthcare Practitioners ASHP and by WHO (16, 21, 23) .

Patients who suffer from depression commonly visit community pharmacies to seek advice on a newly prescribed antidepressant , consult on its safety and its proper use , or ask for nonprescription remedies for either somatic or non-somatic symptoms resulting from undiagnosed depression or failure in treating depression. Treatment failure may underline poor follow up with physician, incompliance to regimen or premature dropping of antidepressant medication (35, 43). Several studies have demonstrated that community pharmacists can play a unique role in supporting such patients (56). This role underlies a set of pharmacist practices or interventions that were described in the literature (39), and were centered around mental health medication support service .These community pharmacist interventions were shown to improve consumer outcomes across different measures and could be easily adaptable (51). An important example is seen in the BLOOM program that was done in Canada in 2018, in the context of community pharmacy mental healthcare capacity building. This program involved mixed-method research on the role of community pharmacist regarding mental health patients(57). In this program, a community pharmacist follow-up encounter with a mental health patient happened mostly for medication optimization,

proved to be effective and its median duration was around 15 minutes (57). More specifically, in patients with depression, the provision of adequate follow up and medication management and counselling by pharmacists, particularly upon treatment initiation, can have a positive effect on patient adherence to antidepressant medications. It may also decrease the chance of relapse and positively influence several other mental health outcomes (51).Evidence on these roles will be discussed in details in the next sections.

Pharmacists can greatly enhance patients' adherence to antidepressant regimens through medication counselling and management. They can improve patients' understanding of their mental health condition and the purpose of taking their antidepressants as prescribed (33, 35). Recent studies from the Kingdom of Saudi Arabia (KSA) and Kuwait showed that patients who were counselled on their antidepressant medication by a pharmacist had significantly better medication adherence (50)**,** compared to those who did not receive counselling (50). In Canada, the BLOOM program (57), the most frequent mental healthcare care activity performed and the reason for patients' follow-up meetings with the study community pharmacists were related to medication management. As high as 89% of the patients reportedly entered the program for medication optimization. Upon discharge from the program, 78% of the patients had outcome scores indicating that the issue behind their enrollment in this program was "resolved" or "improved"(57) . A systematic review in Spain also provided evidence on the improvement of patient adherence to antidepressants. Patients diagnosed with depression who received collaborative care interventions that included pharmacists and other allied healthcare professionals had a 0.65 probability of remaining adherent to their medications, and that was translated to a number needed to treat that was equal to 7 (56, 58) . However, it recommended more research in this

area, specifically outside of the USA (56). In a 2018 systematic review, medication management and counselling provided by pharmacists had a positive impact on patient adherence to antidepressant medication in adult outpatients, but no clear effect on clinical symptoms. This suggested a need for more longitudinal research on the relationships between community pharmacist interventions, patient adherence to treatment, and depression related clinical outcomes (53).

Drug attitude and antidepressant treatment acceptability of depressive patients were significantly improved when community pharmacists provided coaching on depression and antidepressant medications to patients who initiated treatment by a primary healthcare provider (54).

In patients initiated on an antidepressant, treatment satisfaction, general disease–related concerns and medication overuse beliefs were shown to improve significantly as a result of a community pharmacists' intervention. This occurred when community pharmacists practiced a role in assessing patients' beliefs and knowledge about antidepressants using a shared decision making framework, as was seen in some studies (25, 26).

Improvement of health-related quality of life was another important outcome of the pharmacist intervention. A systematic review done in 2017 showed that patients newly diagnosed with depression reported a higher health-related quality of life when they received focused education on depression from a community pharmacist (55). However, there was no difference in the severity of depression or health-related quality of life after 6 months (50).

2.3 Factors affecting pharmacists' practices in depression care:

A key question would be, whether pharmacists are actively providing antidepressant counseling and what major factors are affecting pharmacists' decisions,

willingness and ability to play such an important role in the community setting (33). No extensive literature is available on that, and most of the evidence mainly comes from USA and other western countries. A common finding from available studies was that pharmacists provided a smaller number of pharmacy services to patients with mental illnesses, compared to patients with other chronic diseases (59)

Literature focused on the main interacting factors such as the pharmacist attitude and stigma towards depression and mental illness in general, attitude towards pharmacist role in mental health care, and pharmacists' perceived barriers against delivery of pharmaceutical care of mental illness at the level of community pharmacy (49, 60). Stigma is defined as " a mark of shame, disgrace or disapproval which results in an individual being rejected, discriminated against, and excluded from participating in a number of different areas of society"(61). Several examples from literature explain how these factors may interact differently and have a resulting impact on practice. A cross sectional survey done in Belgium found that pharmacists' attitudes towards mental illness and pharmaceutical care of mental illness to be generally positive. However, it showed that pharmacists' willingness to play a role in patient counselling was not reflected in their current practice, specifically with patients who suffered from depression compared to patients with other physical conditions (60, 62). In another study, the majority of community pharmacists had high mental health literacy, but pointed out that they held some negative attitudes and perceived high stigma towards mental illness, which might have caused a negative impact on their provision of patient care for depression (63) .However, this study was limited by a low response rate that did not exceed 19 %. A survey was done in KSA to assess the attitudes of community pharmacists working at nine pharmacies that were exclusively licensed to dispense psychotropic medications. Results from this survey showed positive pharmacists'

attitudes towards both mental illness and the provision of pharmaceutical care to mentally ill patients. Nevertheless, pharmacists expressed being uncomfortable counseling and following-up on patients for adverse drug-related problems (64) . In a USA study to investigate stigma in different sectors of healthcare providers, community pharmacists' perceived stigma towards depression was similar to the stigma of other health care providers (doctors, nurses..), but lower than that of the general members of the community (49).

Several perceived barriers against the provision of depression care at the level of community pharmacy were reported in the literature (33, 59, 62, 65). Barriers against pharmacist's interventions in depression may relate to the nature of a patient's mental health condition, while others may relate to what pharmacists perceive as general barriers that originate from their professional practice setting. Some of these examples are the lack of private consultation space, lack of access to medical patient medical records, lack of referral system, and lack of time. Of note is that lack of time education and training, followed by lack of time, lack of privacy in the pharmacy and lack of access to information about patient's health profile and medications were the most reported perceived barriers in the literature (62). Nevertheless, some literature has shown that despite the mental health education and trainings that were offered to healthcare students, including pharmacists, stigmatizing attitudes might have still be affected their delivery of care to consumers (60, 62, 66, 67).

In presence of such barriers, and the need to have them well addressed, evidence on the importance of the efforts done to overcome such barriers, specifically those related to organizational and environmental factors , and the sustainability of such efforts still needs to accumulate (68, 69). However, identifying such barriers remained a crucial step that drove several training programs that were able to improve depression-

related knowledge and attitudes of community pharmacists (41, 70, 71).

2.4 Burden and care of depression in Qatar

In Qatar, the 2011 Annual Health Report of the HMC showed that outpatient visits of the HMC Psychiatry Hospital had a 32% increase during the last ten years (17). A high prevalence of psychiatric morbidity in primary health care setting largely goes undiagnosed and consequently unmanaged (4, 17). In 2011, a study based on Qatar Primary Health Care Corporation (PHCC) data, which included 1660 Qatari patients (46.2% males and 53.8% females), showed a 36.6% overall prevalence of mental disorders, among which depression had the highest prevalence (13.5%) (44). In another study done at the PHCC-level in 2013 that examined the frequency of somatic symptoms and its relationship to comorbid mental disorders, found that physical complaints in 15.3% of the patients who visited he primary health care centers were associated with depression (72). The important implications of such results set an urgent need for further local research on mental disease risk factors, burden, treatment gaps and outcomes in order to generate evidence needed by policy makers (4).

Qatar's latest National Health Strategy has set a target to improve access mental health services, aiming at 20% of care being delivered in primary and community sectors by 2020 (3). Qatar PHCC has identified some challenges with respect to the private or community sector In Qatar, such a sector of healthcare has variable quality of care and the unavailability of a clinical information system, which may hinder the implementation of specific quality measures usually needed to monitor standards of service delivery. Recently, new clinical guidelines for depression and anxiety were introduced in Qatar as a measure to integrate care pathway between primary and secondary care (73).

Qatar also set a goal to increase community awareness on mental health illness

and increase availability of services, while acting against stigma towards mental health issues in general. Additionally, the introduction of more high-quality mental health services in both community and inpatient settings was set as an action plan to utilize adequate skill-mix of mental health professionals across all settings of care (3). HMC Recently introduced community based mental liaison service at one pilot center of PHCC, in an effort to start implementing community based model of mental health care.(74)

2.5 Evidence on roles of community pharmacists in Qatar:

Several surveys were conducted lately in Qatar to examine the current practice, knowledge of different disease areas, and attitude of community pharmacists towards practicing some pharmacy extended roles. Results from these surveys showed that pharmacists had a generally positive attitude towards involvement in cardiovascular disease (CVD) prevention(31), acute gastroenteritis management (75), and breast cancer awareness (76). Nevertheless, there was a clearly reported lack of needed knowledge and skills that reflected in their suboptimal practices in such health areas. Some other surveys assessed the current involvement and attitudes of community pharmacists about providing health promotion activities for patients with diabetes, asthma, and CVD as well as delivering smoking cessation counselling and intervention (31, 77, 78).. For example, diabetic patients were found to be mainly receiving basic services (traditional counselling about blood sugar lowering medications and self-testing of blood glucose) from community pharmacists (77). With respect to smoking cessation activities, pharmacists had a similar positive attitude. Moreover, a smoking cessation program delivered by ambulatory pharmacists in Qatar was shown to significantly decrease smoking rates at 3 and 6 months compared with usual care (30).

There is a little known about whether pharmacists in Qatar are sufficiently

contributing to depression care. No published data in Qatar is available so far to indicate whether community pharmacists are keen to provide needed support for such patients, neither to describe their current attitudes and preparedness towards depression care, which appear to be important factors that are likely to affect pharmacists' provision of medication management and counselling (33, 51, 59) .

Given that stigma against mental health is a major barrier that prevents patients with major depression from seeking treatment (62), and that it is quite common that patients who remain undiagnosed complain from unexplained somatic and non-somatic symptoms , such patients tend to frequently seek help in primary care (72, 79) and community pharmacies .

Qatar had identified an urgent need for further local research on mental disease risk factors, outcomes, burden and treatment gaps in order to obtain evidence for policymaking (4).Additionally, there is a documented scarcity in local research around pharmacy practice pertaining to mental health, specifically in the area of community pharmacy practice. Hence, it would be important to explore the current practice and attitudes of pharmacists towards those patients. Literature has demonstrated how several sociodemographic factors were associated with the level and the intent to deliver medication management services by community pharmacists (33, 59, 62). The literature on the effect of such factors on stigma towards depression was also contradictory (80). We envisage that, what we learn from the literature that is based in the western world would not fit exactly in the local context of the Gulf region, and hence, it would be important to explore how practices and attitudes of pharmacists might be different. For example, data from USA showed that pharmacy type and pharmacist demographic variables such as gender, age, and years of practice were not significant predictors of the intent of community pharmacists to provide medication

therapy management services (81) . However, with the exception of gender, the effect of sociodemographic factors varied to a certain extent across studies done in other parts of the world. For example, a study that explored the current practices of community pharmacists in Qatar in the field of CVD showed that practices varied significantly depending on the type of pharmacy; i.e., whether they worked in a the outpatient pharmacy of a hospital, a community pharmacy of a private clinic or that located in a shopping mall (31).

Based on all factors discussed previously in this section , and due to the nature of depression as disease which leads to low adherence and high loss in follow up with physicians, our study addressed community pharmacists working in the private sector only, and did not include those working in the public sector. We assume that pharmacists at outpatient pharmacies of the public healthcare centers are not only less accessible, but also have a practice that is confined to a particular profile of depressive patients (82). Such pharmacists mainly encounter patients who come to dispense medication right after a follow up with their physicians, and consequently they interact to a lesser extent with patients who have medication adherence issues or those who stopped following up with their physicians.

CHAPTER 3: AIM, RESEARCH QUESTIONS AND HYPOTHESIS

3.1 Study aim and objective:

Our study aims to investigate the role of Qatar community pharmacists' in relation to depression management in community care, which has been a major public health issue. The objective of this study is to assess attitudes, practices and perceived barriers of community pharmacists in relation to depression care .This was done by conducting an online survey describe how community pharmacists in Qatar rate their:

- Current practices in relation to depression care, particularly medication management and counselling.
- Attitudes towards depression care.
- Perceived barriers that might affect their performance with respect to depression care.

3.2 Study hypothesis and research questions:

We hypothesize that community pharmacists in Qatar are willing to play a role in depression care and are aware of barriers against such a role. In addition, we hypothesize that community pharmacists' attitudes and their socio-demographic and professional characteristics might be associated with their degree of practicing of depression care at the level of community pharmacy.

Research questions that we would like to address are:

- What are the current practices of Qatar community pharmacists' in relation to depression care?
- How do community pharmacists rate their attitudes towards depression and their role in depression care?

- What are their current perceived barriers against caring for patients with depression who visit their pharmacies?
- How are their reported attitude towards depression, their sociodemographic and professional characteristics related to their current practices?

CHAPTER 4: METHODS

4.1 Study design

This study is a cross-sectional survey targeting community pharmacists in Qatar. An online survey using SurveyMonkey™ software was circulated in the form of an email containing the survey link. In order to have more participation, pharmacists who submitted the survey were eligible to enter a draw to win the latest edition of "Lexicomp Drug Information Handbook". Reminders were planned apriori to be sent on two consecutive weeks and then after one month, and responses to be collected until reaching the desired response rate. . We targeted a reasonable response rate of 30%.This was based on response rates in similar studies in literature, including surveys that were addressed to the same population of Qatar community pharmacists, and assessed the practices and attitudes of towards provision of care to patients with several non-mental diseases (33, 59, 62, 77, 83).

4.2 Study population

All retail/community pharmacists practicing in Qatar were eligible for participation in the survey. There were no specified criteria for exclusion from enrollment in this study. Qatar MoPH has an up-to-date contact database of all community pharmacists practicing in Qatar (around 1200 pharmacists). This list was adapted with permission for use in the study. The survey email was sent to all pharmacists in the provided list, which corresponded to the whole population of licensed community pharmacists who are practicing in Qatar at the time of conducting the survey.

4.3 Design of survey questionnaire

An inclusive literature review was conducted using PubMed, Cochrane and Google Scholar search engines. We used different key word combinations and included

meta-analyses, randomized controlled trials, systematic reviews, clinical practice guidelines and review papers about pharmacist's role in depression care and mental health promotion, and relevant articles were adapted for development of our survey instrument. A questionnaire was then adapted with permission from previous studies that assessed the attitudes and practices of pharmacist towards depression care. Those studies were conducted in KSA (64),USA (33, 59, 84), Europe (60, 66) ,UK (85) and UAE (86). We sought permission to adapt the instruments used in these studies by contacting corresponding authors via email. All these instruments were based on valid items mainly adopted from The Depression Attitude Questionnaire DAQ (87) , The Revised DAQ Questionnaire (88), The Depression Stigma Scale (80) and the Defeat Depression Questionnaire (89) .

The draft survey was sent to a number of faculty members at the College of Health Sciences and The College of Pharmacy of Qatar University, who are experts in the subject area and in survey design. They did not follow a structured technique, but simply assessed whether each of the survey scale items matched the given conceptual domain .They also provided their comments on the survey readability, content validity, clarity, relevance and time to completion (90). The instrument reliability was also be pretested by seven community pharmacists whose responses were not included in the survey later. Minor modifications in the survey were applied accordingly, like rephrasing some item statements and adding some definitions of some of the medical terms used. Internal consistency and reliability were tested using Cronbach's alpha reliability analysis and showed high internal consistency (alpha coefficient=0.91).

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Survey items included in the final version of the survey addressed four main sections (Appendix A):

Section I is composed of the community pharmacists' sociodemographic and pharmacy practice characteristics. Sociodemographic and pharmacy practice characteristics included age (60), gender, highest academic qualifications, number of years of practice, mental health trainings, current position in pharmacy, and personal experience with depression. Additionally, we included questions on the type of pharmacy setting, socio-economic and ethnic origin of patients who frequently visit this pharmacy (60, 91, 92), and the frequency of dispensing antidepressant medications at that pharmacy (31, 56, 59).

Section II is about pharmacists' current depression-related practices. Those were adapted from published instruments of previous studies (33, 59) mainly in the context of counselling and antidepressant medication management. Pharmacists where asked how frequently they provided information on the symptoms, purpose, efficacy, side effects, and time course of their antidepressant treatment, and how often they managed adherence, screened, followed up or referred patients who have depression (33, 59, 93).

Section III explored pharmacists' attitudes toward depression care. Attitudes are defined as "organizations of feelings and behavioral tendencies" (59). A valid instrument which we adapted from literature for use in this section considered attitudes to depression to be composed of 4 domains; attitudes towards causes of depression, attitudes towards nature and course of treatment of depression, attitude towards patients with depression (66, 88), and attitude and perceptions of their professional roles (59). We measured attitude collectively by including items that were specific to each of those domains (60).Some of the items of the four domains of attitude were initially drawn from the Common Sense Model CSM and the Theory of Planned Behavior TPB ,two theoretical models that explain the relationship between individual's attitude and his

practice . Items from TPB measured self-efficacy i.e. pharmacists' confidence in their current scientific knowledge, their skills and their ability to communicate with patients who suffer depression. These items were: " I have adequate current knowledge on medication therapy for major depression", "I make it a priority to counsel patients with major depression on the importance of adhering to their prescribed antidepressant medications ", "I am comfortable to counsel patients with major depression on the importance of adhering to their prescribed antidepressant medications", "I am confident about my ability to counsel patients with major depression on the importance of adhering to their prescribed antidepressant medications" and "I am interested to counsel patients with major depression on the importance of adhering to their prescribed antidepressant medications". Items drawn from CSM measure a set of perceptions related to mental illness (49, 81). The set of CSM items which we used in our adapted instrument asked about the emotional and psychological consequences of depression, perceptions about the pharmacist role and its possibility of controlling and curing depression, about perceptions of depression as a chronic disease that is recurrent and episodic in nature.

Section IV asked pharmacists about their perceived barriers in relation to depression counseling provision (86) . The items used in this section were adapted from a valid instrument that measured pharmacists' attitude towards depression care (60, 62) Items of this instrument were drawn from the TPB, which defined barriers as "organizational influences and environmental influences external to the pharmacy that facilitate or restrict antidepressant counselling" (33). Examples are the lack of a private area for consultation, lack of time, lack of personnel, lack of needed knowledge and lack access to patients' health profile.(33, 49, 59, 60, 62).

To assess their depression care practices, pharmacists were asked to rate, on a five point Likert scale, how often they performed each of a number of activities that are related to depression counselling. Response categories included ‘‘Never’’, ‘‘Rarely’’, ‘‘Sometimes’’, ‘‘Most of the time’’, and ‘‘Always’’. Similarly, a 5-point Likert scale “strongly agree”, “agree”, “neutral”, “disagree”, “strongly disagree” was used to measure the extent to which pharmacists agreed with statements related to their attitude towards the nature of depression, towards patients with depression and towards their role in depression care. As for barriers, pharmacists were provided with a list of items and were asked to identify which of these items they would consider a barrier to depression care (86).

Study outcomes were then measured by calculating scores of attitudes towards depression care and scores of self-reported practices in depression care, and by identifying the number of perceived barriers of respondents.

4.4 Survey implementation

The list of 1200 community pharmacist contacts provided by the MoPH was screened for any duplicate or invalid email addresses where we ended up with 975 unique email addresses. The online survey was then circulated between September and December 2019 using all addresses in our resultant list. Reminder emails were sent at 1, 2 and 4 weeks intervals (94). Emails that included the survey link asked the pharmacists to reply by “done” any time after they submit the survey in order to include their email addresses in the prize draw. By doing so, we insured their individual responses remained unidentifiable.

4.5 Ethical approval and confidentiality

An explanatory statement about the aim of the survey and the confidentiality of collected data were included in the first page of the survey instrument (Appendix A), so that all pharmacists who filled survey could be considered as consented. The survey questionnaire was completely anonymous. Before conducting the analysis, we made sure to remove any identifiable information that respondents could have possibly included in their answers. The study was approved by the Ministry of Public Health MoPH of Qatar and Qatar University Institutional Review Board QU IRB (QU-IRB 1131-E/19) (Appendix B). It was also funded by a student grant from Qatar University (QUST-2-CHS-2019-15). All data related to the study were saved in a password-protected database along with all related study documentation and kept with the study primary investigator at Qatar University College of Health Sciences.

4.6 Study outcomes

The study outcome variables are pharmacists' self-reported practices in relation to depression care, self-reported attitude, and perceived barriers of community pharmacists in relation to depression care

4.7 Statistical analysis

Descriptive analysis

A depression practice score was created by coding participants' answers to each of the depression-related practice statements as never = 1, rarely = 2, sometimes = 3, usually = 4 and always =5, then adding up the scores of all practice statements to create a practice score for each pharmacist. The highest scores were assigned to statements that indicated higher levels of practice .Based on the presence of 12 statements in the practice scale, the summed practice score was measured on a potential scaled score range of 12 to 60 (59). Similarly, an attitude score related to pharmacist's attitude towards depression care was created by coding each attitude item as strongly agree =

5, agree = 4, neutral = 3, disagree =2 and strongly disagree = 1. The highest scores were assigned to items that indicated more positive attitude and vice versa. .Pharmacists' attitude towards depression care fell under the previously mentioned four domains of attitude, and hence attitude scores were measured using the four corresponding subscales. Each of the attitude towards causes of depression subscale, attitude towards patients with depression subscale and attitude towards pharmacists' role in depression care subscale was comprised of 11 items, while the subscale that measured attitude towards the course of depression was comprised 10 items ,Scores of these four subscales were summed to create a total attitude score for each pharmacist. Hence, the resultant total number of attitude items was equal to 43.Accordingly, the total attitude score was measured on a potential scaled score range of 43 to 215. We also added the total number of selected barriers to indicate a number of perceived barriers for each pharmacist (31, 33).

Descriptive statistics for respondent characteristics and responses of the full cohort of respondents were examined. We summarized continuous variables, such as scores of attitude and scores of practice, by using means and standard deviations or medians and interquartile ranges for variables that showed skewed distributions (95). For a better description and understanding of practice scores and attitude scores, we transformed each of them from its original scale to a scale of 1 to 5. We considered a total score between 3 and 4 to indicate moderately positive attitude and moderate degree of practice, while that higher than 4 indicated highly positive attitude or high degree of practice. Similarly, a total score between 2 and 3 indicated slightly negative attitude or poor practice, while that lower than 2 indicated very negative attitude and poor practice. Frequency distributions were used to describe categorical variables that defined baseline characteristics such as gender, country of education, pharmacy type...etc.

Frequency distributions were also used to describe item variables that measured pharmacists' depression-care-related practices and those which measured pharmacists' attitude towards depression. We similarly described the frequency of each identified type of barrier. Testing for reliability and internal consistency of our adapted instrument was done using Cronbach alpha, with an alpha coefficient of 0.91 indicating high level of internal consistency.

Plans for missing data

Missing data is an expected issue in self-administered surveys, where respondents tend to opt out from answering some of the survey questions due to different reasons, such as the presence of some sensitive questions or the use of lengthy surveys (96). Our survey had to be relatively lengthy, in order to address the several study outcomes and meet the study objectives. This is specifically applicable to the section that assessed pharmacists' attitudes, which is a multi-faceted outcome that had to be measured over four domains, based on a valid instrument from literature (60). Additionally, the survey was self-administered, and it included demographic and behavioral information, which makes it more prone to have missing values and resultant bias. Therefore, we assessed the presence of missing values in our collected data by applying descriptive statistics. We also planned to explore the type of any missing data; i.e., whether it was missing completely at random MCAR, by applying Little's Test for MCAR data. We also planned to describe the patterns and depth of such missing data (96).

Regression analysis

Regression analysis was then performed to assess the proposed relationships between the score of practices as the dependent variable, and the potential predictor variables: score of attitudes, sociodemographic characteristics, personal experience

with depression, characteristics of the pharmacy practice site and the number of perceived barriers.

Three continuous variables, which were age, the average number of daily prescriptions and the average percent of weekly prescriptions that contained antidepressants showed the presence of some outliers, so we categorized them according to interquartile range and clinically meaningful cut-offs (24). We also combined the categories of the variables, which described the pharmacist country of origin into three main categories: East Mediterranean origin, South East Asian, and other nationalities. This was done according to WHO definition of regional groupings , so as to make more meaningful inferences (97). We similarly regrouped the variable related to the country where the pharmacist practiced previously .However, we kept "other GCC countries" as a separate category since these countries have a common profile of pharmacy practice and a healthcare system which is similar to that in Qatar, but which varies from that of the remaining East Mediterranean countries (28, 98). Such a categorization can also sort out the effect of the different levels of stigma in Qatari and GCC communities compared to other countries, which is proposed to have an impact on the extent of delivering depression care to community members (99).

Bivariate analyses (using a univariate regression) were first conducted to investigate the association between depression practice score and each of the variables (demographics, pharmacist professional characteristics, attitudes score and barriers score). Variables with a p-value of 0.20 or less at the bivariate analysis level were included in the multivariate model (100, 101) .

A multivariate linear regression was then estimated using practice scores as the dependent variable and the potential predictors retained from the bivariate regression analysis. We used this model to assess the significant predictors of practice, and we

reported an effect size for each predictor using coefficients and confidence intervals .Our statistical analyses was conducted using STATA 15.1 software, and with an assigned a p-value of 0.05 for statistical significance.

Regression Diagnostics

Regression diagnostics were applied to explore the presence of unusual and influential data, assess the validity of regression assumptions (linearity, normality of residuals, heteroscedasticity and multi-collinearity) and assess the final model fit. We considered a cutoff value of 10 for assessing multi-collinearity based on evidence from literature (102) .

Bias Assessment

We investigated the presence of non-response bias by comparing the baseline characteristics of early respondents (first 20%) with those of late respondents (last 20%), using Chi-square test of proportions. This method of response bias assessment is evident in literature (33, 59), and is based on the Continuum of Resistance model, which implies that late-responders are expected to be similar to non-respondents on the measures of interest (103).

Only a sub-cohort of the full respondent set was analyzable and could hence be utilized in the multiple regression analysis. Therefore, we compared the baseline characteristics of this regression sub-cohort with those of the full cohort of respondents using Chi-square test of proportions (59).

We also sought to assess any selection bias that would limit the generalizability of our study results to the whole population of 1200 community pharmacists in Qatar. Thus we compared some baseline characteristics of our respondent sample with what available to us from the MoPH data and from similar surveys that were done previously in Qatar. Those characteristics included pharmacist age, country of origin, years since

last pharmacy degree graduation, and the type of pharmacy. This kind of comparison had been used to assess selection bias in a similar study in literature (31)

CHAPTER 5: RESULTS

5.1 Descriptive Analysis:

Based on the full pharmacist list provided by MoPH, and after screening it for duplicate emails, our mailing list included 975 unique email addresses of practicing community pharmacists. A total of 918 emails were successfully delivered to pharmacists, while 57 emails bounced back. In response to those 918 emails , we ended up with 358 pharmacists filling the survey (39% response rate). Out of these 358 returned responses, 205 were complete and had no missing data on any of the variables (Figure 1).

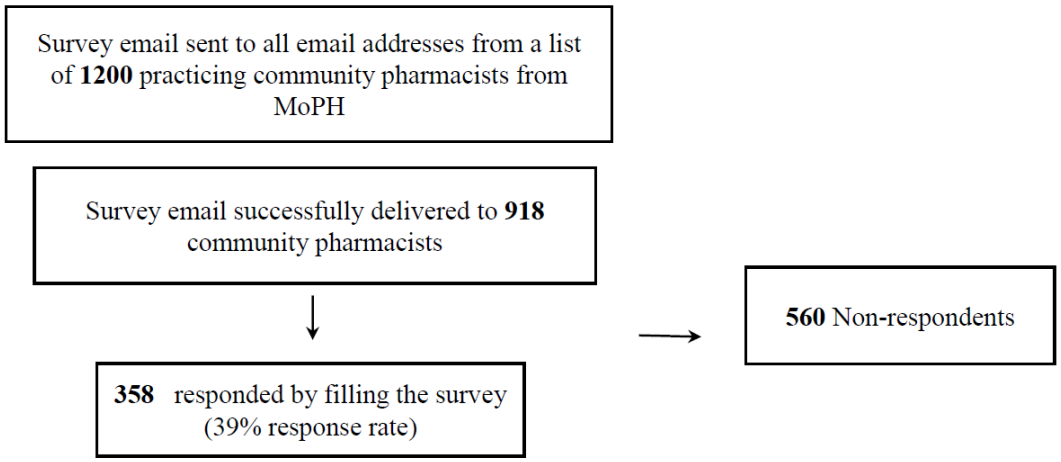

Figure 1: Survey Flowchart

The baseline characteristics of the pharmacists who responded to our survey are shown in Table 1. The majority of pharmacists were from Indian origin, had a median age of 32 years, held a BSc in pharmacy and had practiced as a community pharmacist for less than 5 years. Not more than one fifth of respondents had attended a course or a continuous development training session about depression or mental health in general, over the last two years. The estimated percentage of weekly prescriptions containing an

antidepressant was 2%, while the majority of pharmacists (81.7%) reported that antidepressant prescriptions constituted up to 10% of the average weekly prescriptions dispensed at their pharmacy. Twelve pharmacists indicated they were not sure what percentage of the weekly prescriptions received at their pharmacy included antidepressants. Only 8.1% of the respondents indicated that they ever suffered a certain type of mental illness, while around one third reported having a family member or a friend who suffered a mental illness. Yet around 22% preferred not to disclose any information in that regards.

Six covariates had more than 5 % of missing values, which were years since last pharmacy degree graduation (n=19, 5.3%), age (n=25, 7.0%), average number of daily prescriptions (n=31, 8.7%), the percentage of weekly prescriptions that contain antidepressants (n=37, 10.3%), number of perceived barriers (n=83, 23.2%), and scores of total attitude (n=95, 26.5%). We presented an illustration of the patterns of missing data and its frequency distribution in Appendix C. We could see that 73 pharmacists contributed to the missing data on the number of perceived barriers and scores of total attitude: 12 pharmacists had missing data only on scores of total attitude , 4 had missing data only on scores number of perceived barriers while 57 pharmacists had missing values on both variables. This could probably be explained by the fact that our survey was conducted online, and questions which collected data on those two covariates were positioned in the last two sections of the survey, so sometimes survey length may cause participants to skip more questions towards the end of the survey and tend to submit the survey prematurely (104, 105). Further investigation of missing data was done, where result from Little's test for MCAR was not statistically significant (Chi-Square = 4.75, p-value =0.09).Thus we concluded that results from our survey were not affected by the presence of missing data as the data was missing completely at random.

This means that the random subset of missing values had a similar distribution to that of observed values, so causes of missing-ness were not related to pharmacists' characteristics or responses. We accordingly conducted our analysis using only complete cases with no need of imputation for missing data (96).

Table 1: Pharmacists' Baseline Socio-demographic and Professional Characteristics

Characteristic	n (%) or Median (Interquartile range)
Gender n=358	
Male	212(59.7)
Female	143(40.3)
Age (in years) n=333	32(8)*
Less than30 years	119(35.7)
30-40 years	165(49.6)
Older than 40 years	49(14.7)
Country of origin n=354	
East Mediterranean	148(42.0)
South East Asian	204(58.0)
Country of previous practice n=351	
East Mediterranean	131(37.3)
South East Asian	202(57.6)
GCC country	18(5.1)
Highest Academic Degree n=354	
Undergraduate degree	314(88.7)
Postgraduate degree	40(11.3)
Years since last pharmacy degree graduation n=339	
Less than 5 years	74(21.8)
5-10 years	130(38.3)
11-15 years	66(19.5)
More than 15 years	39(20.4)
Attended any specialized training or continuing education (CE) activity related to any mental health topic during the last 2 years n=354	
No	277(78.2)
Yes	77(21.8)

Characteristic	n(%) or Median (Interquartile range)
Attended any specialized training or continuing education (CE) activity related to depression during the last 2 years n=352	
No	289(82.1)
Yes	63(17.9)
Years of experience as a community pharmacist n=351	
Less than 5 years	202(57.6)
5-10 years	102(29.0)
11-15 years	28(8.0)
More than 15 years	19(5.4)
Current position in pharmacy n=353	
Pharmacist in training	24(6.8)
Employee pharmacist	214(60.6)
Other	115(32.6)
Type of current community/retail pharmacy where pharmacist is practicing n=351	
Pharmacy located in a shopping mall or a supermarket	189(53.8)
Pharmacy located in a private clinic	49(13.9)
Pharmacy located in a private hospital	15(4.3)
Street pharmacy	74(21.1)
Others	24(6.9)
Socioeconomic class of patients visiting this pharmacy n=350	
Low socioeconomic class	50(14.3)
Middle socioeconomic class	220(62.8)
Upper socioeconomic class	80(22.9)
Ethnicity of patients visiting this pharmacy n=349	
Arabs/Middle Easterners	73(20.9)
Asians	34(9.7)
A mix of all nationalities	242(69.4)
Availability of a private/confidential area to counsel patients (in person or over the phone) n=348	
No	229(65.8)

Characteristic	n (%) or Median (Interquartile range)
Yes	119(34.2)
Presence of a psychiatric clinic close to the pharmacy n=348	
No	257(73.9)
Yes	37(10.6)
I don't know	54(15.5)
Number of pharmacists working in pharmacy during one shift n=350	
One pharmacist	263(75.1)
More than one pharmacist	87(24.9)
Average number of prescriptions processed on a workday at this pharmacy n=327	8(16)*
<4	73(22.3)
4-8	102(31.2)
8-20	58(17.8)
>20	94(28.7)
Percentage of weekly prescriptions containing antidepressants n=321	2(4)*
<1%	68(21.1)
1%-10%	204(63.6)
>10%	49(15.3)
Pharmacist ever suffered from a mental illness n=344	
No	295(85.8)
Yes	28(8.1)
Prefer not to disclose	21(6.1)
Pharmacist has a family member or friend with mental illness n=344	
No	227(66.0)
Yes	95(27.6)
Prefer not to disclose	22(6.4)

East Mediterranean countries: Jordan, Palestine, Syria, Iraq, Egypt, Sudan
South East Asian countries: India, Philippines, Pakistan
GCC countries: KSA, UAE, Oman, Kuwait, Qatar or Bahrain
*Median (Interquartile range)

5.1.1 Pharmacists' practices in relation to depression care

The survey included 12 different activities that defined pharmacists' practices in relation to counselling and medication management for patients who have depression (Table 2). The extent of pharmacists' involvement in these depression care practices was low, (mean score=2.64, SD= 0.94,), out of a possible score of 5.Pharmacists' minimum practice score was 1 and the maximum was 12. The distribution of the score of practice is shown in Figure 2. Internal consistency testing of this scale was done using Cronbach alpha which showed high consistency (alpha coefficient=0.94). Only about one third of pharmacists reported being "usually" or "always " involved with a range of 1-4 out of these 12 activities .The most practiced depression care activity was encouraging adherence to antidepressants (37.22%). This was followed by practices like providing information about the time course of response to antidepressant medication (33.19%), providing information about the purpose of treatment with antidepressants (33.34%) and discussing options for managing possible side effects of antidepressant medications (28.93%). In addition, 66.46% of pharmacists reported that they "rarely "or "never" screened patients for major depression or other mental illness, and 64.87% reported they "rarely" or "never" followed up patients who have major depression.

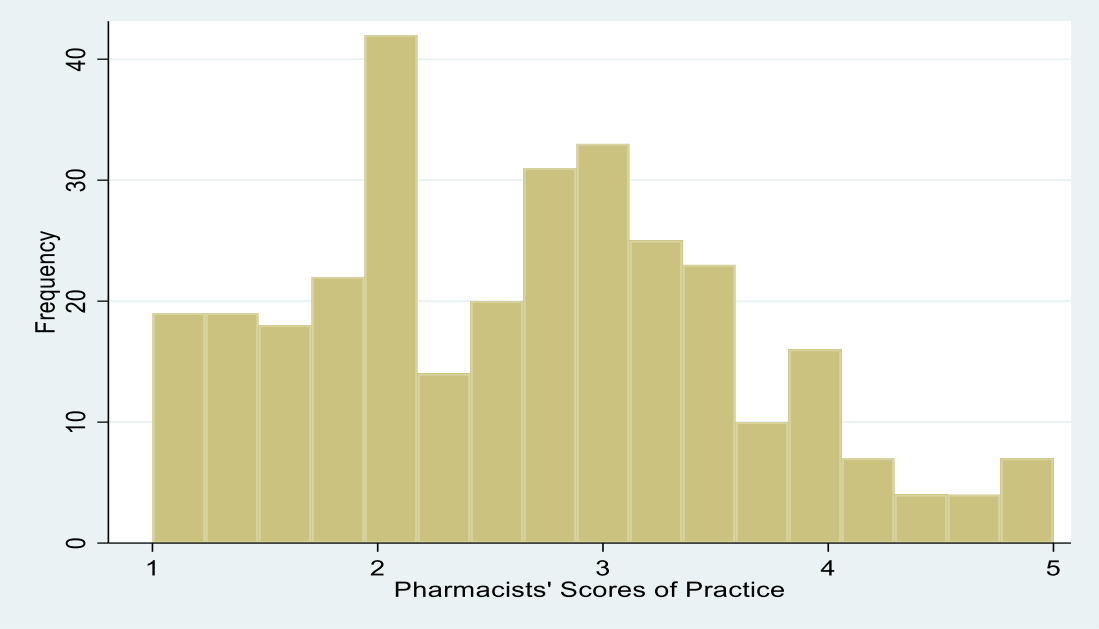

Figure 2: Distribution of Scores of Practice (n=314)

Table 2: Pharmacists' Practices in Relation to Depression Care

	n (%)					
	How often do you perform each of the following depression care related activities?					Mean Score* (SD)
	Never	Rarely	Sometimes	Usually	Always	
Provide verbal information about major depression and/or about the prescribed antidepressant drug regimen (n=318)	33 (10.37)	103(32.38)	109 (34.27)	41 (12.89)	32(10.06)	2.79(1.11)
Provide written information/handout/guide about major depression and/or about the prescribed antidepressant drug regimen (n=318)	104(32.70)	83(26.10)	73(22.96)	36(11.32)	22(6.92)	2.33(1.23)
Provide information about symptoms and/or causes of major depression (n=317)	58(18.29)	88(27.76)	100(31.56)	41(12.93)	30(9.46)	2.67(1.19)
Provide information about the purpose of the antidepressant medication (n=316)	33(10.44)	89(28.16)	88(27.85)	69(21.84)	37(11.71)	2.96(1.17)
Provide information about the time course of response to antidepressant medication (n=317)	40(12.62)	79(24.92)	92(29.03)	63(19.78)	43(13.56)	2.96(1.22)
Discuss options for managing possible side effects of antidepressant medication (n=318)	44(13.84)	81(24.47)	101(31.76)	50(15.72)	42(13.21)	2.88(1.21)
Ask patients about potential barriers to taking the	50(15.87)	84(26.66)	93(29.53)	55(17.46)	33(10.48)	2.0(1.20)

antidepressant(s) prescribed (n=315)

	n (%)					
	How often do you perform each of the following depression care related activities?					**Mean Score* (SD)**
	Never	**Rarely**	**Sometimes**	**Usually**	**Always**	
Encourage adherence to the antidepressant regimen. (n=317)	52(16.40)	71(22.40)	76(23.97)	70(22.08)	48(15.14)	2.97(1.30)
Contact patients' physician to adjust the prescribed antidepressant regimen (change dose, remove or add additional medications) (n=317)	103(32.49)	93(29.34)	76(23.97)	31(9.78)	14(4.42)	2.24(1.13)
Follow up patients who have major depression.(n=316)	110(34.81)	95(30.06)	64(20.25)	34(10.77)	13(4.11)	2.19(1.14)
Screen patients for major depression or other mental illness (n=316)	141(44.62)	69(21.84)	68(21.52)	27(8.54)	11(3.48)	2.04(1.14)
Refer patients to trusted mental health care practitioners in the community (n=317)	64(20.19)	66 (20.82)	86 (27.13)	48 (15.14)	53(16.72)	2.87(1.35)
Overall Mean Score of practices**						2.64(0.94)

*Mean score of individual practice items out of possible score of 5, rated on a 1-5 Likert scale (1= never 2=rarely 3=sometimes, 4=usually 5=always). Higher scores indicate more practice of depression care activities.
**Mean score of practices for all the respondents, out of possible score of 5

5.1.2 Pharmacists' attitude towards depression care

Pharmacists' attitude was defined by four domains: attitude to causes of depression, attitude towards the nature, course and treatment of depression, attitude towards patients with depression, and attitude towards pharmacists' role in depression care. The mean score of total attitude was estimated to be 3.41, with standard deviation of 0.26, out of a maximum possible score of 5, and hence showing moderately positive attitudes towards depression care in general (Figure 3). Internal consistency testing of this scale was done using Cronbach alpha showed high consistency (alpha coefficient=0.90).

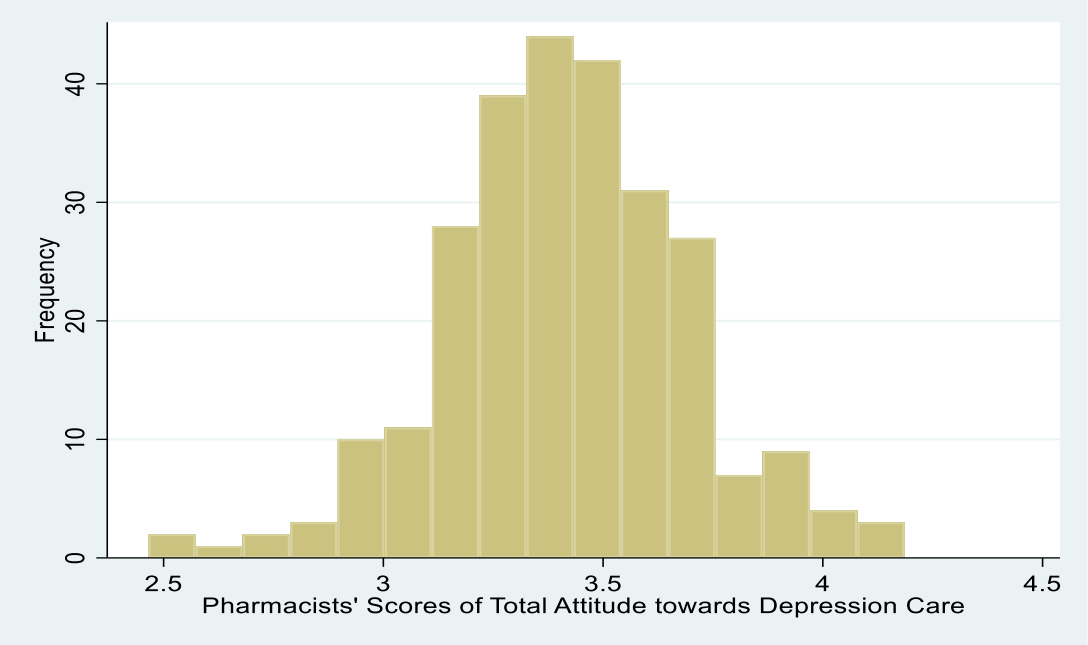

Figure 3: Distribution of Scores of Total Attitudes (n=263)

Table 3 shows the mean scores and the distribution of responses regarding pharmacist perceived causes of depression. The overall mean score to this domain was 3.49, with a standard deviation of 0.36, out of a maximum possible score of 5, and indicating a

moderately positive attitude towards causes of depression. The top two perceived causes of depression were stressful life style and negative life events (87.54 % and 85.91%). More than 70% of pharmacists agreed or strongly agreed that depression may be caused by psychological, biochemical and other biological factors like heredity and disorders of brain metabolism. At the same time, a majority agreed that depression was also caused by weakness of character (63.73%) and by influence of mass media (70.47%)

Table 3: Pharmacists' Attitudes towards Causes of Major Depression

Statement	n (%)					Mean Score*(SD)
	What is your extent of agreement to whether each of the below is a cause of major depression?					
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	
Stressful lifestyle (n=297)	10(3.37)	5(1.68)	22(7.41)	128(43.10)	132(44.44)	4.23(0.91)
Problems with other people (n=296)	7(2.36)	14(4.73)	47(15.88)	166(56.08)	62(20.95)	3.88(0.87)
Disorder of brain metabolism (n=298)	9(3.02)	12(4.03)	70(23.49)	130(43.62)	77(25.84)	3.85(0.95)
Heredity (n=295)	9(3.05)	42(14.24)	88(29.83)	117(39.66)	39(13.22)	3.45(0.99)
Environmental poisons** (n=295)	30(10.17)	110(37.29)	103(34.92)	48(16.27)	4 (1.36)	2.61(0.92)
Influence of mass media** (n=298)	3(1.01)	6(2.01)	79(26.51)	155(52.01)	55(18.46)	2.15(0.77)
Today's achievement-oriented society (n=298)	5(1.68)	14(4.70)	66(22.15)	137(45.97)	76(25.50)	3.88(0.89)
Negative life events (n=298)	8(2.68)	6(2.01)	28(9.40)	133(44.63)	122(41.28)	4.19(0.89)
Weakness of character** (n=298)	4(1.36)	22(7.46)	81(27.45)	130(44.07)	58(19.66)	2.26(0.90)
Biochemical causes (n=296)	1(0.34)	15(5.07)	59(19.93)	158(53.38)	64(21.28)	3.90(0.79)
Psychological causes (n=298)	2(0.67)	7(2.35)	43(14.43)	173(58.05)	73(24.50)	4.03(0.73)
Overall Mean score of pharmacists' attitudes towards causes of depression***						3.49(0.36)

*Mean score of individual attitude items with scores out of possible score of 5, rated on a 1-5 Likert scale (1= strongly disagree 2=disagree 3=neutral 4=agree 5=strongly agree). Higher scores indicate more positive attitude towards cause of disease.
**Reverse coded items (1= strongly agree 2=agree 3=neutral 4=disagree 5=strongly disagree) are "Environmental poisons", "Influence of mass media" and "weakness of character".
***Mean score of pharmacists' attitudes towards causes of depression, out of possible score of 5.

Pharmacists' moderately positive attitude towards the nature, course and treatment of depression (mean score=3.64, SD= 0.39), was evident in their responses on seven out of the ten items that were listed under this domain (Table 4). For example, more than 85% of the pharmacists agreed or strongly agreed that major depression has major consequences on life, can be treated , and that patients with major depression need support and understanding from their environment . The majority of pharmacists (57.85%) also agreed or strongly agreed that patients generally understand the counseling information delivered to them by pharmacists. While around two thirds of pharmacists agreed or strongly agreed that depression can improve with time and that antidepressants were addictive, almost half of them disagreed or strongly disagreed that most patients with depression get better without treatment.

Table 4: Pharmacists' Attitudes Towards the Nature, Course and Treatment Approach of Major Depression

Statement	n (%) What is your extent of agreement to whether each of the below is a cause of major depression?					Mean Score*(SD)
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	
Major depression is a real disease (n= 299)	8(2.68)	26(8.72)	41(13.77)	110(36.91)	113(37.92)	3.98(1.05)
Major depression has major consequences on life (n=298)	3(1.01)	5(1.68)	29(9.72)	138(46.31)	123(41.28)	4.25(0.77)
Major depression will improve with time (n= 296)	13(4.39)	32(10.81)	85(27.70)	125(42.23)	44(14.86)	2.47(1.01)
There is a lot that patients can do to control symptoms (n= 296)	6(2.02)	15(5.05)	51(17.17)	159(53.54)	66(22.22)	3.88(0.87)
There will be periods of depression and periods of improvement. (n= 297)	2(0.67)	6(2.02)	46(15.49)	182(61.28)	61(20.54)	3.98(0.70)
Antidepressant is addictive (n= 295)	12(4.07)	39(13.22)	68(23.05)	125(42.37)	50(17.29)	2.44(1.05)
Major depression can be treated (n= 296)	4(1.35)	4(1.35)	34(11.49)	138(46.62)	116(39.19)	4.20(0.80)
Most patients with major depression get better without treatment (n= 296)	32(10.81)	116(39.19)	79(26.69)	46(15.54)	23(7.77)	3.29(1.09)
Patients with major depression need support and understanding from their environment (n=297)	3(1.01)	8(2.69)	27(9.10)	108(36.36)	151(50.84)	4.33(0.83)
Patients with major depression generally understand the counseling information I deliver to them (n=280)	1(0.36)	11(3.93)	106(37.86)	128(45.71)	34(12.14)	3.65(0.75)
Overall Mean Score of Pharmacists' attitudes towards the nature, course and treatment approach of depression***						3.64(0.39)

*Mean score of individual attitude items, out of possible score of 5, with scores rated on a 1-5 Likert scale (1= strongly disagree 2=disagree 3=neutral 4=agree 5=strongly agree). Higher scores indicate more positive attitude towards cause of disease.
**Reverse coded items (1= strongly agree 2=agree 3=neutral 4=disagree 5=strongly disagree) are: “Major depression will improve with time”,” Antidepressant is addictive” , “Antidepressant can change one’s personality” , “Most patients with major depression get better without treatment”
***Mean score of pharmacists’ attitudes towards nature, course and treatment approach of depression of depression out of possible score of 5

However, pharmacists had generally negative attitudes towards patients with depression, as this domain scored lowest among all four attitude domains (mean score= 2.83, SD=0.37) (Table 5). The highest scoring item, which was “Anyone could suffer from depression”, tended to be the only positive attitude towards patients which the majority of pharmacist shared (81.80%). Around two thirds of pharmacists agreed or strongly that antidepressants could change one’s personality (63.95%), that patients with depression did not believe they needed medication (71.06%) and were hard to talk to (60.81%). All the remaining items of this domain were agreed on by almost half of the pharmacists. For example, 51.51% of pharmacists indicated that patients who suffered depression did not adhere to their medications, and 48.63% said that these patients were less willing to be counseled by pharmacists in comparison to patients without depression. In addition, around half of the respondents expressed that patients with major depression did not put unnecessary strain on pharmacists and were at higher risk for discrimination by healthcare professionals.

Table 5: Pharmacists' Attitudes Towards Patients with Major Depression

Statement	n (%) What is your extent of agreement to each of the below statements?					Mean Score* (SD)
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	
Patients with major depression are at higher risk for discrimination by healthcare professionals(n= 297)	18(6.06)	50(16.84)	98(33.00)	108(36.36)	23(7.74)	3.22(1.01)
Patients with major depression do not believe they need medication (n=294)	4(1.36)	29(9.86)	86(29.26)	141(47.96)	34(11.56)	2.41(0.86)
Patients with major depression do not adhere to their medication (n= 297)	2(0.67)	35(11.78)	107(36.04)	121(40.74)	32(10.77)	2.50(0.86)
Patients with major depression are hard to talk to (n= 296)	4(1.35)	37(12.50)	98(33.11)	134(45.27)	23(7.77)	2.54(0.85)
Patients with major depression have themselves to blame (n=297)	14(4.71)	30(10.10)	106(35.69)	116(39.06)	31(10.44)	2.59(0.96)
Patients with major depression are unreliable (n= 296)	15(5.07)	43(14.53)	125(42.24)	93(31.42)	20(6.76)	2.78(0.94)
Patients with major depression ae less willing to be counseled by pharmacists than are patients without depression (n=296)	5(1.68)	53(17.90)	94(31.78)	113(38.17)	31(10.47)	2.61(0.95)
Anyone can suffer from major depression (n=298)	5(1.68)	14(4.70)	35(11.74)	142(47.65)	102(34.23)	4.08(0.89)
Antidepressant can change one's personality (n=294)	10(3.40)	29(9.86)	67(22.79)	144(48.98)	44(14.97)	2.44(1.10)
I believe patients with major depression do not put un-necessary strain on me (n=280)	4(1.43)	39(13.93)	117(41.78)	96(34.29)	24(8.57)	3.34(0.87)
It is easy to recognize a patient who has major depression (n=297)	11(3.70)	55(18.2)	90(30.30)	116(39.06)	25(8.42)	2.70(0.98)
Overall Mean Score attitude to patients with depression ***						2.83(0.37)

*Mean score of individual attitude items, out of possible score of 5, with scores rated on a 1-5 Likert scale (1= strongly disagree 2=disagree 3=neutral 4=agree 5=strongly agree). Higher scores indicate more positive attitude towards cause of disease.
**Reverse coded items (1= strongly agree 2=agree 3=neutral 4=disagree 5=strongly disagree) are: “Patients with major depression do not believe they need medication”, ”Patients with major depression do not adhere to their medication” ,“Patients with major depression are hard to talk to”, “Patients with major depression have themselves to blame”, “Patients with major depression are unreliable”, ”Patients with major depression are less willing to be counseled by pharmacists than are patients without depression”, ‘Antidepressant can change one’s personality”, “I believe patients with major depression do not put un-necessary strain on me” and “It is easy to recognize a patient who has major depression.
***Mean score of pharmacists’ attitudes to patients with depression, out of possible score of 5

As for the attitude towards pharmacists' role in depression care(Table 6), the overall mean of pharmacists' scores was the highest compared to their scores on the 3 previous attitude domains (mean score=3.71,SD=0.48). This indicates that pharmacists had relatively more positive attitudes towards their role than towards depression as a disease or towards patients who suffer from depression. The proportion of pharmacists who agreed or strongly agreed to 10 out of the 11 items in Table 6 ranged between 38.52% and 83.93%. The highest score was for the item "I should actively support the recovery efforts made by individuals who suffer from major depression", and the lowest score was for the item, "Patients with major depression do not want to talk about this with a pharmacist." Items on interest, comfort and confidence to counsel patients with major depression on the importance of adhering to their prescribed antidepressant medications were among these 10 highly scoring items, with proportions of pharmacists who agreed or strongly agreed was being 78%, 73.3% and 65.7% respectively. Around half of the pharmacists reported that they had adequate current knowledge on medication therapy for major depression.

Table 6: Pharmacists' attitudes Towards Their Role in Care of Major Depression

Statement	n (%)					
	What is your extent of agreement to each of the below statements?					Mean Score*(SD)
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	
I should actively support the recovery efforts made by individuals who suffer from major depression (n=280)	4(1.43)	2(0.71)	39(13.93)	146(52.14)	89(31.79)	4.12(0.77)
I should advise patients on all potential side effects of antidepressant medications (n=280)	3(1.07)	14(5.00)	47(16.78)	127(45.36)	89(31.79)	4.01(0.88)
It is ethical for me to tell the patient what the purpose of antidepressant drug is (n=280)	3(1.07)	8(2.86)	54(19.29)	135(48.21)	80(28.57)	4.00(0.83)
I believe that physicians do not always deliver all relevant and needed depression related information to their patients (n=280)	5(1.79)	32(11.43)	114(40.71)	99(35.36)	30(10.71)	3.41(0.89)
I have adequate current knowledge on medication therapy for major depression (n=280)	3(1.08)	20(7.17)	103(36.91)	128(45.88)	25(8.96)	3.54(0.79)
I make it a priority to counsel patients with major depression on the importance of adhering to their prescribed antidepressant medications (n=277)	3(1.08)	9(3.25)	62(22.39)	152(54.87)	51(18.41)	3.86(0.78)
I am comfortable to counsel patients with major depression on the importance of adhering to their prescribed antidepressant medications (n=280)	8(2.86)	11(3.93)	58(20.71)	140(50.00)	63(22.5)	3.84(0.93)

I am confident about my ability to counsel patients with major depression on the importance of adhering to their prescribed antidepressant medications (n=280)	7(2.50)	12(4.29)	79(28.21)	131(46.79)	51(18.21)	3.72(0.91)
I am interested to counsel patients with major depression on the importance of adhering to their prescribed antidepressant medications (n=279)	4 (1.43)	6 (2.15)	59(21.15)	132(47.31)	78(27.96)	3.97(0.98)
Major depression is a disease like any other (e.g. , asthma, diabetes) (n= 297)	17 (5.7)	55(18.5)	57(19.2)	103(34.7)	65(21.9)	3.48(1.18)
Patients with major depression do not want to talk about this with a pharmacist (n=296)	14(4.73)	61(20.61)	107(36.14)	84(28.38)	30(10.14)	2.81(1.02)
Overall Mean Score attitude towards pharmacist role in care of major depression***						3.71(0.48)

*Mean score of individual attitude items, out of possible score of 5, with scores rated on a 1-5 Likert scale (1= strongly disagree 2=disagree 3=neutral 4=agree 5=strongly agree). Higher scores indicate more positive attitude towards cause of disease.
**A reversely coded item (1= strongly agree 2=agree 3=neutral 4=disagree 5=strongly disagree) is "Patients with major depression do not want to talk about this with a pharmacist"
***Mean score of pharmacists' attitudes towards pharmacist role in care of major depression out of possible score of 5

A summary of the attitude scale and subscales is presented in Table 7. Across the 4 domains used to assess pharmacists' total attitudes, the relatively most positive pharmacists' attitude was shown towards their role in depression care (mean score= 3.71 , SD=0.48) , while their attitude towards patients with depression was the least positive (mean score= 2.83 , SD=0.37) . Pharmacists' attitude towards the nature, course and treatment of depression and towards causes of depression were moderately positive, with mean scores of 3.64 and 3.49 and standard deviations of 0.39 and 0.36 respectively. All these scores were measured out of a total possible score of 5.

Table 7: Descriptive Summary of Attitude Scales

Scale	**Mean (SD)**	**Minimum score**	**Maximum score**
Attitude towards causes of depression (11 items)	3.49 (0.36)	1.90	4.27
Attitude towards the nature, course and treatment of depression (10 items)	3.64 (0.39)	2.20	4.60
Attitude towards patients with depression(11 items)	2.83 (0.37)	1.72	4.27
Attitude towards role in depression care (11 items)	3.71 (0.48)	2.27	4.90
Total attitudes towards depression care (43 items)	3.41 (0.26)	2.46	4.18

SD Standard Deviation
*Scores displayed were transformed from their original scales to a scale of 1-5

5.1.3 Pharmacists' perceived barriers towards depression care

The survey asked pharmacists whether they agreed or disagreed to each of eight listed perceived barriers, in order to calculate a number of perceived barriers per

pharmacist. Pharmacists' perceived a median number of barriers that was equal to 6 (based on skewness of distribution), with an interquartile range of 2, and a range between 0 and 8 (Figure 4). The majority of pharmacists agreed on all the items in the list of perceived barriers which our survey proposed, except for the item on "sensitivity to ethnic/cultural differences", where slightly less than half of the pharmacists considered this as a barrier against provision of care to depressed patients at the level of community pharmacy. The top four perceived barriers were lack of access to patient's medical profiles (83.21%), lack of patient's insight on major depression and the importance of treatment (81.85%), lack of needed knowledge and training on mental health (79.63%) and lack of private setting in the pharmacy (74.73%) (Table 8).

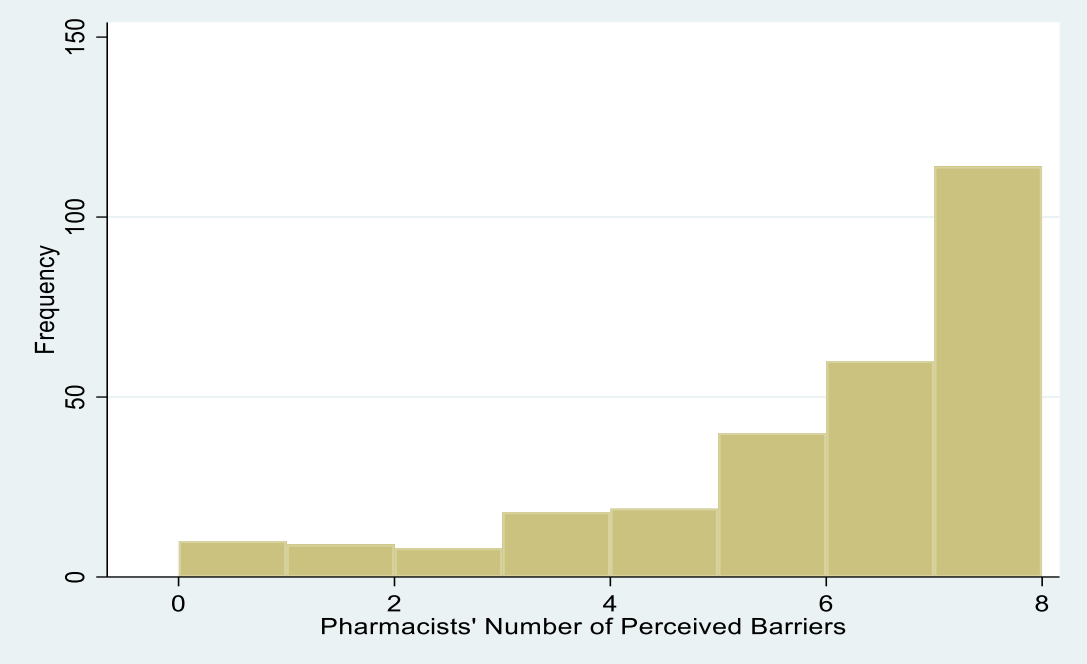

Figure 4: Distribution of the Number of Perceived Barriers (n=275)

Table 8: Pharmacists Perceived Barriers against Care of Major Depression

Barrier	**n (%)**
Lack of access to patients' medical profiles (n=268)	223 (83.21)
Lack of patient's insight on major depression and the importance of treatment (n=270)	221 (81.85)
Lack of knowledge /training on mental health (n=270)	215 (79.63)
Lack of a private setting in the pharmacy (n=273)	204 (74.73)
Lack of needed time (n=273)	193 (70.70)
Lack of clear clinical guidelines (n=272)	188 (69.12)
Shortage of personnel (n=272)	180 (66.18)
Sensitivity to ethnic/cultural differences (n=274)	132 (48.18)

5.2 Regression Analysis:

Bivariate analysis

Bivariate analyses using a univariate linear regression was first conducted to investigate the association between depression practice score and each of the independent variables: sociodemographic and professional characteristics of pharmacists, characteristics of practice setting, personal experience with depression , scores of attitude and the number of perceived barriers (Table 9). Out of the 22-predictor variables that were used in our survey, 14 variables appeared to be associated with practice scores using a statistical significance level of p-value ≤ 0.20. These variables were attitudes towards depression care, the number of perceived barriers towards depression care, pharmacists' sociodemographic characteristics (gender ,age) , pharmacists' professional characteristics (country of previous practice , years since last pharmacy degree graduation, having attended a training or course on depression topic in the last 2 years), having ever suffered a mental illness , having a family member or a friend with mental illness, and some characteristics of practice settings (type of pharmacy setting , ethnicity of patients attending this pharmacy , presence of a

psychiatric clinic close to the pharmacy , the percentage of weekly prescriptions that included antidepressant , and the presence of a private counselling area). Based on literature about the confounding effect of some variables and on the significance of association with the outcome at the bivariate analyses, all these 14 variables were used to estimate a multiple linear regression model.

Table 9: Bivariate Linear Regression of the association between the Score of Practices and Potential Predictor Variables

Variable	Coefficient	95% CI*	P-value
Gender			
Male	*Reference*		
Female	-5.81	(-8.32, -3.31)	<0.001
Age (in years)			
Less than 30 years	*Reference*		
30-40 years	-4.35	(-7.16 ,-1.53)	<0.01
Older than 40 years	-6.69	(-10.64, -2.74)	<0.01
Country of origin			
East Mediterranean	*Reference*		
South East Asian	1.01	(-1.55, 3.59)	0.43
Country of previous practice			
East Mediterranean	*Reference*		
South East Asian	1.50	(1.14, 4.15)	0.26
GCC country	-4.15	(-10.05, 1.75)	0.16
Highest Academic Degree			
Undergraduate degree	*Reference*		
Postgraduate degree	-0.76	(-4.86, 3.33)	0.71
Years since last pharmacy degree graduation			
Less than 5 years	*Reference*		
5-10 years	-0.87	(-4.22, 2.47)	0.60
11-15 years	-7.26	(-11.13, -3.39)	<0.001
More than 15 years	-5.50	(-9.32, -1.68)	<0.01

Variable	Coefficient	95% CI*	P-value
Attended any specialized training or continuing education (CE) activity related to any mental health topic during the last 2 years?			
No	*Reference*		
Yes	1.37	(-1.67, 4.42)	0.37
Attended any specialized training or continuing education (CE) activity related to depression during the last 2 years			
No	*Reference*		
Yes	3.91	(0.65, 7.16)	0.01
Years of experience as a community pharmacist			
Less than 5 years	*Reference*		
5-10 years	-0.34	(-3.22, 2.53)	0.81
11-15 years	-2.16	(-6.83, 2.49)	0.36
More than 15 years	-5.71	(-11.52, 0.08)	0.05
Current position in pharmacy			
Pharmacist in training	*Reference*		
Employee pharmacist	0.54	(-4.58, 5.67)	0.83
Other	1.44	(-3.88, 6.78)	0.59
Type of current community/retail pharmacy where pharmacist is practicing			
Pharmacy located in a private hospital	*Reference*		
Pharmacy located in a private clinic	-2.91	(-9.97, 4.14)	0.41
Pharmacy located in a shopping mall or a supermarket	5.13	(-1.32, 11.59)	0.11
Street pharmacy	4.15	(-2.63, 10.93)	0.23
Other	0.035	(-7.94, 8.01)	0.99
Socioeconomic class of patients visiting this pharmacy			
Low socioeconomic class	*Reference*		
Middle socioeconomic class	-1.37	(-4.99, 2.25)	0.54
Upper socioeconomic class	-1.31	(-5.47, 2.85)	0.53
Ethnicity of patients visiting this pharmacy			
Arabs/Middle Easterners	*Reference*		
Asians	3.37	(-1.35, 8.11)	0.16

Variable	Coefficient	95% CI*	P-value
A mix of all nationalities	4.80	(1.71, 7.89)	0.002
Availability of a private/confidential area to counsel patients (in person or over the phone)			
No	*Reference*		
Yes	3.88	(1.23, 6.54)	0.004
Presence of a psychiatric clinic close to the pharmacy			
No	*Reference*		
Yes	6.49	(2.46 10.52)	0.002
I don't know	-0.88	(-4.33 2.56)	0.61
Number of pharmacists working in pharmacy during one shift			
One pharmacist	*Reference*		
More than one pharmacist	0.13	(-2.82, 3.10)	0.92
Average number of prescriptions processed on a workday at this pharmacy			
<4	*Reference*		
4-8	-0.12	(-3.75, 3.50)	0.94
8-20	-1.75	(-5.17, 1.66)	0.31
>20	-2.93	(-6.79, 0.92)	0.13
Percentage of weekly prescriptions containing antidepressants			
<1%	*Reference*		
1%-10%	4.19	(0.91, 7.47)	0.01
>10%	6.97	(2.68, 11.25)	0.002
Pharmacist ever suffered from a mental illness			
No	*Reference*		
Yes	-3.23	(-7.70, 1.23)	0.15
Prefer not to disclose	-6.24	(-11.49, -0.98)	0.02
Pharmacist has a family member or friend with mental illness			
No	*Reference*		
Yes	2.49	(-0.30, 5.30)	0.08
Prefer not to disclose	-3.11	(-8.09, 1.86)	0.21
Pharmacist scores of total attitude towards depression	0.27	(0.15, 0.38)	<0.001

Number of pharmacist's perceived barriers	-0.78	(-1.44, -0.11)	0.02

*95% Confidence Interval
East Mediterranean countries: Jordan, Palestine, Syria, Iraq, Egypt, Sudan
South East Asian countries: India, Philippines, Pakistan
GCC countries: KSA, UAE, Oman, Kuwait, Qatar or Bahrain

Multiple linear regression

Results from the multiple regression model are shown in Table 10. Pharmacists' level variables that showed a p-value < 0.05 were considered to have a statistically significant association with practice scores of attitude. Pharmacists' practice of depression care showed a small but statistically significant association with pharmacists' attitudes towards depression care. The score of practice increased by 0.22 units with every unit increase in attitude score (95%CI =0.09 to 0.35, p=0.001), controlling effects for the sociodemographic, professional characteristics of pharmacists, those of practice site, and score of barriers. Practice scores also increased with the increasing percentage of weekly prescriptions that contained antidepressants, with marginal statistical significance (p=0.05). However, practice scores decreased with the number of years since last pharmacy degree graduation , where pharmacists who graduated within the past 5 years had significantly higher scores of practice compared to those who did not (p = 0.02). Female pharmacists showed significantly lower involvement in depression care practices compared to male pharmacists, practice scored lowered by =4.36 (95% CI =-7.46 to -1.26, p<0.01). Pharmacists who reported to having a psychiatric clinic close by their site of practice were more involved in depression care. Their scores of practices were statistically significantly higher by 7.63 units compared to those who reported not to have one (p=0.01). Similarly, the presence of a private consultation area in the pharmacy was strongly associated with delivering depression care. Pharmacists who reported having a private consultation area produced

significantly higher scores of practice by 3.39 units, compared to those who did not (p=0.03). There was also a marginally statistically significant association between the type of pharmacy and the extent of delivery of depression care. Pharmacists who delivered depression care most were the pharmacists working in a pharmacy located in a shopping mall, compared to those who worked in the private pharmacy of a hospital, who showed the lowest scores of practice among all (p=0.05).

Table 10: Multiple Linear Regression of the Association between the Scores of Practices and Potential Predictor Variables (N=205)

Variable	**Coefficient**	**95% CI***	**P-value****
Gender			
Male	*Reference*		
Female	-4.36	(-7.46, -1.26)	0.006
Age (in years)			
Less than 30 years	*Reference*		
30-40 years	0.02	(-4.47, 4.47)	0.99
Older than 40 years	0.26	(-6.85, 7.38)	0.94
Country of previous practice			
East Mediterranean	*Reference*		
South East Asian	1.74	(-1.49 , 4.99)	0.28
GCC country	-4.04	(-10.96, 2.87)	0.25
Years since last pharmacy degree graduation			
Less than 5 years	*Reference*		
5-10 years	-2.53	(-6.93, 1.86)	0.25
11-15 years	-7.51	(-13.28, -1.74)	0.01
More than 15 years	-8.22	(-15.10, -1.35)	0.01
Attended any specialized training or continuing education (CE) activity related to depression during the last 2 years			
No	*Reference*		
Yes	2.25	(-1.56, 5.87)	0.25
Type of current community/retail pharmacy where pharmacist is practicing			

Variable	Coefficient	95% CI*	P-value**
Pharmacy located in a private hospital	Reference		
Pharmacy located in a private clinic	2.58	(-6.71, 11.88)	0.58
Pharmacy located in a shopping mall or a supermarket	6.83	(-1.91, 15.59)	0.12
Street pharmacy	5.59	(-3.49, 14.46)	0.21
Other	-0.12	(-10.75, 10.51)	0.98
Ethnicity of patients visiting this pharmacy			
Arabs/Middle Easterners	*Reference*		
Asians	3.66	(-2.45, 9.79)	0.23
A mix of all nationalities	2.27	(-1.37, 5.92)	0.22
Availability of a private/confidential area to counsel patients (in person or over the phone)			
No	*Reference*		
Yes	3.39	(0.20, 6.59)	0.03
Presence of a psychiatric clinic close to the pharmacy			
No	*Reference*		
Yes	7.63	(2.54, 12.71)	0.003
I don't know	1.52	(-2.56, 5.61)	0.46
Percentage of weekly prescriptions containing antidepressants			
<1%	*Reference*		
1%-10%	2.47	(-1.33, 6.28)	0.20
>10%	6.35	(1.81, 11.52)	0.01
Pharmacist ever suffered from a mental illness			
No	*Reference*		
Yes	-2.75	(-8.98, 3.48)	0.38
Prefer not to disclose	-2.47	(-9.06, 4.11)	0.45
Pharmacist has a family member or friend with mental illness			
No	*Reference*		
Yes	3.20	(-0.32, 6.74)	0.07
Prefer not to disclose	-0.13	(-6.23, 5.96)	0.96

Variable	Coefficient	95% CI*	P-value**
Pharmacist scores of total attitude towards depression	0.22	(0.09, 0.35)	0.001
Number of pharmacist's perceived barriers	-0.17	(-0.95, 0.60)	0.65

*95% Confidence Interval
**p-value <0.05 is considered as statistically significant
East Mediterranean countries: Jordan, Palestine, Syria, Iraq, Egypt, Sudan
South East Asian countries: India, Philippines, Pakistan
GCC countries: KSA, UAE, Oman, Kuwait, Qatar or Bahrain

5.3 Regression Diagnostics:

Regression diagnostics using normality of residuals analysis showed that residuals were normally distributed, as shown in Appendix D, Figure 5. Tests for homogeneity and residuals versus predictor plot showed no violation to the assumption constant variance (Breusch- Pegan test p value = 0.30). Regression diagnostics also showed the absence of multi-collinearity as variance inflation factor (VIF) was <10 for all the variables (102). Our model was correctly specified, with a p-value of the squared predictor= 0.81, indicating that there was no specification error.

5.4 Results of Bias Assessment:

Non-response bias assessment

The results of Chi-square tests showed all showed no statistically significant differences between early respondents and late respondents, except for the percentage of prescriptions that contained antidepressants (p value = 0.002).We concluded that no important differences in baseline characteristics existed between early and late responders. However, pharmacists who worked in a pharmacy that was more involved in dispensing antidepressant medications seemed to have responded earlier to our survey (Appendix E).

Selection bias assessment

We compared some baseline characteristics of our respondent sample with those from similar surveys that were done previously in Qatar. In a survey conducted in 2018 by Hajj et al, the mean age of Qatar community pharmacists was 35 years compared to 32 years in our study. In the same 2018 survey, the highest percentage (88%) of pharmacists were from Egypt and India (77).This is also similar to the percentages by nationality that we collected in our study before we regrouped them into the two main categories; i.e., the East Mediterranean and South East Asian origin categories. Pharmacists from India and Egypt summed up to 74.2% of our total respondents. In the same 2018 survey by Hajj et al, the vast majority of pharmacists had attained their degree in the past 5-15 years (61%), mainly worked in community pharmacies of shopping malls (53%), while only 25% practiced in outpatient pharmacies of hospitals. There was a similar trend in the proportions of the baseline characteristics of our respondents. Up to 78% of our respondents had attained their degree in the past 5-15 years, and a lower proportion of them practiced in hospital and private clinics (13.96 and 4.257% respectively), compared to the proportion of those who worked in pharmacies of shopping malls and in street pharmacies (53% and 21.08%, respectively). Moreover, our observed distribution of pharmacists according to pharmacy types also compared well with what data available on Qatar Council of Healthcare Practitioners (QCHP) website about the distribution of Qatar community pharmacies (26).

We also checked whether the complete case cohort of 205 respondents, which was analyzable, differed in baseline characteristics from the full respondent cohort of 358 pharmacists. No important differences in baseline characteristics were found between the (Appendix F). Although we found one statistically significant difference with respect to the average number of daily prescriptions, where pharmacists in the multiple regression sub-cohort reported a higher average of daily prescriptions, this

variable was not significantly associated with practice in the bivariate analysis and was not included in the final model based on which we built our results.

CHAPTER 6: DISCUSSION

6.1 Key Findings from this study:

Our objectives in this population survey were to explore the current practices, attitudes and perceived barriers against delivery of depression care at the level of community pharmacy in Qatar, and what factors predicted the provision of depression counselling and medication management services.

Our results showed that Qatar community pharmacists were not actively involved in any of the depression related activities which were described in literature as potential extended roles, and which fall beyond traditional dispensing of medications. Not more than one third of Qatar pharmacists were involved with any type of the listed depression care practices, and the relatively most practiced depression care activity was encouraging adherence to antidepressants (37.22%). This clearly shows that pharmacists are not providing even the basic pharmacy services needed by patients with major depression. These results are similar to findings of a study that was done in Belgium (62) and in USA (33) In 200, a survey in Belgium compared the attitudes and self-reported practices with depressed patients to those with patients suffering other physical conditions in a sample of 69 community pharmacists. A low level of practice was demonstrated, and was much lower than that reported about non-mental health patients. Although 87% of pharmacists strongly agreed that they should be providing information on symptoms, causes or treatment of depression, only 17% of tem reported applying such practice with most or all their patients. The situation was not much different in another USA survey. In this survey of 118 community pharmacists conducted in Alabama, USA (33) findings regarding most of the depression related practices were comparable to our results and to those of the Belgian study .Community pharmacists had almost the same low level of practices regarding providing the needed

information to patients with depression and also regarding other depression related practices. .Only one third of them said they discussed options for managing adverse effects. S Such results from Qatar can be expected, since some local data showed that community pharmacists were also minimally practicing their extended roles in the field of several other chronic diseases, including CVD care, diabetes care, and smoking cessation services (31, 106). However, their level of involvement in those physical health conditions was higher than their involvement in depression care that was reported in our study. For example, diabetic patients were found to be mainly receiving basic services (basic counselling about anti-diabetic medications and blood glucose self-testing) from community pharmacists (77). Qatar pharmacists were also not heavily involved in health promotion for patients with CVD (31). Although the majority reported explaining to patients about the appropriate time for taking antihypertensive medications and about their common adverse effects, only half of them indicated they usually review the medication refill history or provide adherence interventions to those patients.

Importantly, pharmacists' low involvement in depression care practices can be explained by the presence of organizational and environmental barriers related to the healthcare system in Qatar and in the Middle East region (29) .Examples are the lack of access to medical records, absence of referral system and lack of pharmacists' knowledge about mental health topics. In our study, the majority of community pharmacists agreed on the presence of at least six of these barriers. The top four perceived barriers were lack of access to patient's medical profiles, lack of patient's insight on major depression and the importance of treatment, lack of the needed knowledge and training on mental health and lack pf private setting in the pharmacy. The same set of perceived barriers were seen in a 2016 cross-sectional study which

conducted a survey to assess Qatar community pharmacist's perceived barriers to counseling patients with diabetes and those with asthma , as well as assessed pharmacists' current counselling practices using simulated patient approach (78). In another study that assessed their preparedness for medication use review (MUR), community pharmacists in Qatar were found to be knowledgeable about the concept of MUR , however, some important deficiencies still warranted enhancing their education (24) . Our results regarding perceived barriers are also consistent with data from KSA and UAE (64, 86). We investigated the effect of the increasing number of barriers on the scores of practices .However, our multivariate model, that controlled for all possible confounders did not show a significant association between the number of barriers and the scores of depression related practices. A similar result was seen in the study by Cannon et al, where the organizational and environmental barriers against depression care were tested in two separate models, and accounted for only 2% of the variance in self-reported antidepressant counselling scores, controlling for pharmacy characteristics and previous training on depression (33).

Low levels of practices can also be explained by the higher levels of stigma towards mental health in the in the Arab region (99, 107). Stigma towards mental illness at the level of the general population as well as at the level of healthcare practitioners was investigated in several studies in the Arab region (32, 64, 65, 99, 107-110) . A systematic review showed evidence of high levels of stigma towards mental health treatments in the Arab world (99).Another study on stigma towards mental illness was done in a sample of university students in Qatar. It showed that students had some beliefs which reflected poor mental health literacy and hence high stigma, such as beliefs that "medications to treat mental illness can cause addiction", "mental illness is not like any other illness", or that "mental illness is a punishment from God" (108). Our

study assessed the current attitudes of a population of community pharmacists, and our findings suggested that pharmacists had a relatively positive attitude towards the nature, causes and the course of treatment of depression as well as towards their role in depression care, but a negative attitude towards patients with depression. Pharmacists' most positive attitude was expressed towards their role in providing depression care, where their scores reflected relatively high self-efficacy and positive perceptions of the importance of supporting patients with depression. This goes in accordance with findings from a study that was most recently published in Qatar (65) . This study provided local evidence on the attitude of Qatar primary healthcare practitioners towards providing mental health care to their patients. It suggested that primary care practitioners and pharmacists in Qatar perceived that people with mental health illnesses received suboptimal care for their medical comorbidities. It also recommended the importance of collaborative practice and shared responsibilities with patients' family members in order to improve the mental and physical health of patients with mental illnesses. However, in a survey conducted in KSA , pharmacists had positive attitudes to both mental illness and providing care to patients with mental illness, but they expressed being uncomfortable counseling and following-up on patients for adverse drug-related problems (64).

In our study, pharmacists expressed a relatively more negative attitude towards patients with depression compared to that towards depression as a disease or towards their role in managing its treatment. This may reflect their high levels of stigma towards these patients. We can compare such findings to those from Scheerder et al 2009, which assessed the attitudes of community pharmacists using the same four attitude domains that we used in our study. This study found that a more optimistic attitude toward the nature and course of depression was associated with a higher acceptance of

pharmacists' role in depression care, but contrary to our study findings, with a more positive attitude towards patients with depression (60). This could be possibly due to cultural differences in the level of stigma against mental health, which has been shown to be high in the Arab countries (99).

In addition, this study was able to find a statistically significant positive association between pharmacists' attitudes towards depression and their current depression-related practices (effect size estimate= 0.22, 95%CI = (0.09-0.35), p=0.001). This also goes in accordance with results from other studies (33, 59). Giannetti et al found that higher pharmacists' stigma was associated with lower willingness and ability to perform depression counselling, and this willingness was directly associated with the current self- reported mental health related services (59). The same study also showed that pharmacists who were more involved with medication management services, in general, had lower stigma levels towards mental illness. Additionally, evidence from current literature shows that community pharmacists' perceived stigma towards depression was similar to the stigma of other types of health providers, but lower than that reported with general members of the community(49).

Our study survey collected data on several sociodemographic and professional characteristics of the pharmacists and their practice site, as the literature suggested they may be associated, to different extents, with the provision of depression care as well as with attitude and stigma towards depression and mental health in general (80) .

One of the most important sociodemographic predictors of pharmacy practice in depression care in our study was gender, where female pharmacists showed significantly lower involvement in depression care as compared to male pharmacists (effect size estimate=-4.36, 95%CI=-7.46, -1.26 , $p<0.001$). This can be explained from literature, where females held higher stigmatizing views towards depression

(111). The result is also consistent with findings from a study that assessed pharmacists' practices in relation to providing health promotional activities for patients with CVD (31). Based on our survey results, neither age, education level nor previous training on depression were significant predictors of pharmacist practices. Evidence on the strength and significance of these associations varied in literature, as those variables were more established as direct predictors of attitude rather than of current practice (31, 33, 59, 60, 62, 80, 112). It was obvious from our study that pharmacists' lack of knowledge was accompanied by a very low involvement in trainings related to depression. Only half of the pharmacists reported that they had adequate current knowledge on medication therapy for major depression, more than 70 % agreed that lack of knowledge was a barrier to their provision to depression care at the level of community pharmacy. Additionally, not more than 20 % reported they had attended any training on any mental health topic in the past two years. Literature has shown that attending courses or trainings on depression was positively associated with confidence and intent to provide depression care related services in USA community pharmacists (33). The same study found no significant association between pharmacists' age and their willingness to provide depression care. In a Belgian study, positive attitudes of pharmacists towards depression care were not reflected in their current practices due to a lack of adequate education in the field of mental health (62). Contradictory results were found regarding the effect of age were found in a another study, where older age of pharmacists was associated with more pessimistic views towards the course of depression and its treatment, and was associated with pharmacists' negative attitudes towards patients who suffered depression (60).

Among the several pharmacists' professional characteristics that we included in our study, the number of years since last pharmacy degree graduation was the only

characteristic associated with pharmacists' practices regarding depression care. In our study, the majority of respondent pharmacists received their pharmacy degree within less than 10 years from the time of conducting the survey, and those who graduated within the past 5 years had significantly higher scores of practice compared to those who did not ($p = 0.02$), independent of their age. Of note is that we had also investigated any association between pharmacists' score of practice and the number of years they had been practicing as community pharmacists. However, our results were not able to establish such association .We were also not able to find a statistical correlation between the number of years in practice and the number of years since the last pharmacy degree graduation. In contrast, findings from the study by Giannetti et al showed that pharmacists who had practiced community pharmacy for longer periods were less willing and less comfortable to provide mental health care services to their patients (59). In conclusion, we can better interpret our findings of the effect of pharmacist graduation date on the extent of delivering depression care in the context of the new changes in pharmacy curricula, and to the fact that their increased focus on extended pharmacy roles and collaborative care is relatively new. Pharmacy curricula in the Arab world recently started, to varying extents, to focus more on empowering pharmacy students and offering them more trainings related to their role in mental illness and mental health promotion (98).

As for practice site characteristics, our results showed that four properties of the pharmacy had a statistically significant association with pharmacists' delivery of depression care. These were the presence of a private consultation area, the proximity of a psychiatric clinic, the type of pharmacy and the size of antidepressant prescription, as measured by the percentage of weekly prescriptions, which included antidepressant.

The level of pharmacists' involvement in depression counselling and

medication management was significantly higher when a private area was present in the pharmacy (p=0.03), and this goes in accordance with several studies (20, 31, 77, 78, 106) . An explanation of this would be that the presence of such a private space to counsel patients, whether in private or over the phone, would allow for more confidentiality, and could promote more comfortable interaction between pharmacists and patients. This would be specifically true in the context of mental health, where high stigma levels would require more privacy whenever a patient comes to seek advice on a mental health issue or on his/her prescribed mental health treatment regimens (3, 99).

Our results showed the presence of a psychiatric clinic close by the pharmacy was significantly associated with delivering depression care by pharmacists. Pharmacists who reported working in the proximity of a psychiatric clinic had scores of practices that were statistically significantly higher by 7.63 units compared to cores of those of their counterparts , controlling for the size of antidepressant prescriptions at that pharmacy (p=0.003). However, we did not find any literature that studied whether the extent of delivering depression care was related , independently from of rate of dispensing of antidepressants, to practicing in a pharmacy site that is geographically close to a specialized psychiatric clinic .We can think about this factor as being a proxy to more contact with patients who have psychiatric diagnoses. It is possible that more patients with mental illness would be visiting pharmacies that are nearby psychiatric clinics, and hence pharmacists practicing there might be in more contact with those patients, compared to pharmacists practicing at a further geographical distance from such clinics. Prior contact with patients who suffer depression has been demonstrated to impact attitudes towards depression as a mental health condition (80) . However, our survey did not directly collect information on the frequency of contact with depressed patients, and this remains to be a point that warrants further investigation.

Our survey revealed that up to 75% of community pharmacists worked in a pharmacy located in a shopping mall or in a street pharmacy. This goes in accordance with data on the MoPH website and that data provided in the MoPH list of pharmacists. In the latter, numbers showed that the majority of community pharmacists in Qatar were practicing in pharmacies located inside shopping mall pharmacies or street pharmacies .We also found that pharmacy type had an overall marginally significant association with pharmacists' depression care practices (p=0.05). Pharmacists who worked in a pharmacy located in a shopping mall or a street pharmacy tended to have higher scores of practice compared to those working in private hospital outpatient pharmacies. Looking at examples from literature done abroad, we found conflicting results .In one cross sectional survey in USA, the intent of pharmacists to provide medication therapy management (MTM) services did not statistically differ across pharmacy types (81, 112). However, different results were seen in a meta-analysis of studies done in Europe, which compared the extent of pharmacists' involvement in depression care across different settings. It showed that pharmacists in outpatient hospital pharmacies practiced less depression counselling and antidepressant management, but there was a high level of heterogeneity in these studies, and was attributed to the smaller number of pharmacists from the hospital and primary care were involved in the studies (56) . Our results were also compatible with the conclusions of this meta-analysis concerning the issue of the small number of hospital pharmacists. They were also consistent with previous research in Qatar in the context of community pharmacy practice in relation to CVD, were there was significantly higher practice by the community and ambulatory pharmacists compared to hospital pharmacists (31).

Of note is that the reported pharmacy size, as indicated by the number of daily prescriptions, was relatively low in our survey , with reported median number of eight

daily dispensed prescriptions .This number was lower than what was reported in other studies done in Qatar and UAE (31, 83) (113) . At the same time, results from our regression analysis also showed pharmacy size was not significantly associated with the practice. This was inconsistent with the results form a USA study, where authors assessed the factors associated with the provision of mental health services at community pharmacies. They considered that pharmacists whose practice setting had high rates of prescription dispensing practiced more MTM, and their study results showed that higher provision of MTM was associated with higher degrees of willingness, comfort and confidence to provide depression care (59).

Hence, we can say that within the private pharmacy sector which our study addressed, community pharmacies that had the highest rates of dispensing prescription medications might mostly be located in private clinics or outpatient departments of private hospitals, which is similar to what was reported in previous research (113). We can also conclude that due to the small number of private clinic pharmacists and outpatient hospital pharmacists in Qatar, our study wasn't able to detect a possible effect of pharmacy size on the extent of pharmacists' practice on depression care .

On the other hand, our study found a trend increase in pharmacists' depression-related practices with the increase in the size of antidepressant prescriptions, controlling for all other baseline characteristics, including controlling for the presence of a psychiatric clinic in the proximity of the pharmacy. However this result had marginal statistical significance (p=0.05), which could be attributed to the low percentage of antidepressants among all prescriptions. Up to 63 % of pharmacists reported that antidepressants accounted for only between 1% and 10 % of the total weekly prescriptions dispensed at their pharmacy.

Interestingly, and in line with other studies, our findings showed that while there was lower self-reported depression care provision by pharmacists who reported that they had once suffered a mental illness, but higher self-reported depression care provision by pharmacists who had a family member or a friend with a mental illness. Although those both results from our model lacked statistical significance, we could see that such finding coincided with findings from other literature. Having suffered depression was associated with high levels of personal stigma towards depression, and was associated with negative attitudes towards depression(80). Experience with depression, as a measure of perceived stigma, had a positive association with both pharmacists' attitudes and practices (59). A summary of all the key findings from our study is presented in Table 11.

Table 11: Summary of Key Findings From Our Study

1. Qatar community pharmacists were minimally involved in depression-related activities.
2. Lack of access to patients' medical profiles, lack of patient's insight on major depression and the importance of treatment, lack of the needed knowledge and training on mental health and lack of private setting in the pharmacy were the top four perceived barriers towards pharmacists' practice in relation to depression.
3. Pharmacists reported a lack of knowledge about medication management of major depression, and that only 20 % of them had attended a training on a mental health topic in the past two years
4. Pharmacists reported a relatively positive attitude towards depression as a disease, but a negative attitude towards patients with depression. A more positive attitude was associated with higher current practice in relation to depression.
5. Female pharmacists and pharmacists who worked in outpatient pharmacies of hospitals and private clinics were significantly less involved in depression care as compared to their counterparts.
6. Pharmacists who graduated within the past 5 years, those who reported to having a private counselling area in their pharmacy, and those who reported having a psychiatric clinic close to their pharmacy were significantly more involved in delivering depression care services compared to those who did not.

6.2 Study Strengths and Future Implications:

This is the first study conducted in Qatar to explore the current practices and the potential factors that might influence the involvement of Qatar community pharmacists in playing a role in depression .The survey was sent to all the target population using a well-defined and up-to-date sampling frame. The response rate of 39%, which is above the average compared to similar electronic surveys targeting similar audiences in several other studies (33, 59, 60, 63, 77, 91). Results from our study can help in improving our understanding of the current situation of community pharmacy practice in the field of depression care, and may serve as a baseline for further local studies. This is basically important due to the differences in the healthcare system between Qatar and Western countries where most of the research on this topic was conducted. Our results also show that there is room for improvement in the quality of health care provision for patients with mental health... Another important challenge would be that Qatar pharmacists, like other primary healthcare providers, are less trained and less socialized to communicate effectively with individuals with severe mental illness, compared to pharmacists in western countries. This can be attributed to differences in the social norms between countries in the Arab region compared to those in the west. Hence, several challenging steps have to be taken in that direction by policy makers. For example, shared practical trainings that involve direct contact with patients who are being managed for their depression can improve both pharmacist depression stigma and their knowledge on the disease. It can as well improve the skills that are needed for efficient delivery of antidepressant medication management and counselling (23, 114-116). Some campaigns that aimed to improve the involvement of community pharmacists with depression care were also run in Denmark and Australia (23). Future

research should plan for training programs and evaluate their impact on improving not only the knowledge but more importantly the pharmacists' attitudes and decrease their stigma towards patients who suffer from depression .This will offer the much needed enhancement in the practice of this important, yet under-represented, sample of the healthcare sector. Additionally, future studies may provide local evidence of how Qatar community pharmacists can utilize their expertise of counselling and medication management in the field of depression care and how this would improve patients' outcomes. This is especially crucial when dealing with patients who are newly initiated on antidepressants, and those who fail to follow up with their physicians or get the proper advice regarding the importance of adhering to their prescribed antidepressant regimen. Results from this study also shed light on the importance of providing more continuous education activities for community pharmacists in the field of depression. They also highlight the need expressed by community pharmacists regarding access to patient medical profiles, as this issue was one of their top perceived barriers against practicing depression medication counselling and management. Currently, access to medical profile of patients is only available to community pharmacists who work in the outpatient pharmacy of private hospitals and those who work in pharmacies in private polyclinics. These pharmacists constitute a small proportion of the whole population of community pharmacists in Qatar (26). Providing such access to pharmacists working in all community pharmacists needs action from policy makers, and might be potentially driven by the current Qatar National Health Strategy. One of the goals set by this strategy states that the provision of healthcare by the private sector remains to be significant opportunity area and one of the MoPH key considerations (3). Our study can add to the efforts done currently to increase involvement and collaboration of non–mental healthcare workers in depression care, and to improve pharmacy practice in

Qatar. It is also clearly aligned with Qatar's national healthcare strategy on mental health which targets higher engagement of the private health sector (3).

6.3 Study Limitations:

Our study has some limitations. First, it is a cross-sectional survey, hence does not allow us to establish causation. Second, it is a self-reported survey, so there is a possibility of social desirability bias, and our study was not designed to assess such type of bias. Hence, pharmacists' current attitudes and practices in relation to depression care might have been overestimated. We cannot be sure how well our sample of respondents represented the total population of community pharmacists in Qatar in terms of geographical areas where the respondents practiced. However, we were able to compare some other baseline characteristics of our respondent sample with those from the MoPH data and from similar surveys that were done previously in Qatar, and we found no major differences. On the other hand, limited by the survey design, we did not fully assess factors like current knowledge or communication skills of pharmacists, which could have added better understanding of their attitudes and practices. We might have also missed some other potential environmental variables such as financial reimbursement for the extended pharmacy role , and collaboration with other healthcare providers, which could have demonstrated an impact on the association between organizational barriers and the delivery of depression care (28). Finally, findings from this study cannot be extrapolated to pharmacists that work in ambulatory pharmacies of PHCC and HMC. We did not include those pharmacists in our survey due to the main differences in their type of practice. More importantly, major differences exist between the healthcare system in the governmental sector and the private sector regarding access to patient profiles and different modes of dispensing, as this is limited to predefined formularies and to filling and refilling of prescriptions, as

well as differences in the accessibility of those pharmacists by patients. This would warrant future research that targets them separately, and provides data on their attitude and extent of their involvement in depression-related practices.

6.4 Conclusion:

Our study demonstrated that there is a need to improve community pharmacists' attitudes to depression care, as a way to empower them to enhance their currently suboptimal practice in the field. Qatar has taken many important steps towards improving health care provision in general. In the light of scarcity of local data relating to the extent of involvement of pharmacists in mental health care, specifically those working in the private sector, we believe that the results of our study will be providing an evidence-base for future longitudinal studies. This is specifically applicable to the current context in Qatar, at a time when mental health issue is considered as one of the top priority areas in the National Strategies, and which MoPH policymakers are focusing on.

REFERENCES

1. WHO. WHO Mental Health Gap Action Program 2019 [Available from: https: //www.who.int/mental_health/mhgap/en/. .

2. WHO. Global Health Estimates of Depression and Other Mental Disorders 2017 [Available from: https://apps.who.int/iris/handle/10665/254610.

3. MOPH. Qatar National Health strategy 2018-2022 short report [Available from: https://www.moph.gov.qa/english/strategies/National-Health-Strategy-2018-2022/Pages/default.aspx.

4. Bener A, Abou-Saleh MT, Dafeeah EE, Bhugra D. The prevalence and burden of psychiatric disorders in primary health care visits in Qatar: too little time? Journal of family medicine and primary care. 2015; 4(1):89-95.

5. Kates N, Mach M. Chronic disease management for depression in primary care: a summary of the current literature and implications for practice. Canadian Journal of Psychiatry Revue Canadienne de Psychiatrie. 2007; 52(2):77-85.

6. Dhar AK, Barton DA. Depression and the Link with Cardiovascular Disease. Front Psychiatry. 2016; 7(33).

7. WHO. Investing in Mental Health 2013 [Available from: https://apps.who.int/iris/bitstream/handle/10665/87232/9789241564618_eng.pdf;jsessionid=0570B41CFA9056D153548AAAFB94DD70?sequence=1.

8. Williams SZ, Chung GS, Muennig PA. Undiagnosed depression: A community diagnosis. SSM Popul Health. 2017; 3:633-8.

9. Muennig P, Bounthavong M. Cost-effectiveness analysis in health: a practical approach: John Wiley & Sons; 2016 2016.

10. WHO. Depression 2020 [cited 2020. Available from: https://www.who.int/health-topics/depression#tab=tab_1.

11. Maurer DM, Raymond TJ, Davis BN. Depression: Screening and Diagnosis. American family physician. 2018; 98(8):508-15.

12. APA. Practice Guidelines for the Treatment of Patients with Major Depressive Disorder 2010 [Available from: https://psychiatryonline.org/pb/assets/raw/sitewide/practice_guidelines/guidelines/mdd.pdf.

13. NICE. Depression in Adults: Treatment and Management 2018 [Available from: https://www.nice.org.uk/guidance/GID-CGWAVE0725/documents/short-version-of-draft-guideline.

14. Kohn R, Saxena S, Levav I, Saraceno B. The treatment gap in mental health care. Bulletin of the World Health Organization. 2004; 82(11):858-66.

15. WHO. Mental health: strengthening our response [Available from: https://www.who.int/en/news-room/fact-sheets/detail/mental-health-strengthening-our-response.

16. WHO. The Role of the Pharmacist in the Health Care System: PART I 2014 [2020]. Available from: https://apps.who.int/medicinedocs/en/d/Jh2995e/1.6.2.html.

17. HMC. HMC Annual Health Report 2011 [20/04/2019]. Available from: https://www.hamad.qa/Publication/English_report_2010_2011.pdf.

18. HMC. Mental Health Services 2020 [Available from: https://www.hamad.qa/EN/Hospitals-and-services/HMC-Mental-Health-Service/Our-Services/Pages/Community-Services.aspx.

19. Scahill SL, Atif M, Babar ZU. Defining pharmacy and its practice: a conceptual model for an international audience. Integrated pharmacy research & practice. 2017; 6:121-9.

20. El Hajj MS, Awaisu A, Kheir N, Mohamed MHN, Haddad RS, Saleh RA, et al. Evaluation of an intensive education program on the treatment of tobacco-use disorder for pharmacists: a study protocol for a randomized controlled trial. Trials. 2019; 20(1):25.

21. ASHP statement on the pharmacist's role in primary care. American journal of health-system pharmacy: AJHP: official journal of the American Society of Health-System Pharmacists. 1999;56(16):1665-7.

22. George PP, Molina JA, Cheah J, Chan SC, Lim BP. The evolving role of the community pharmacist in chronic disease management - a literature review. Annals of the Academy of Medicine, Singapore. 2010;39(11):861-7.

23. FIP. Focus on Mental Health 2015 [Available from: https://www.fip.org/files/Focus_on_mental_health_-final.pdf.

24. Babiker AH, Carson L, Awaisu A. Medication use review in Qatar: are community pharmacists prepared for the extended professional role? Int J Clin Pharm. 2014;36(6):1241-50.

25. Health QMoP. Qatar National Health Strategy 2018 2022 [Available from: https://www.moph.gov.qa/HSF/Documents/short%20report%20eng%2020.03.2018.pdf.

26. List of registered Healthcare Professionals [Internet]. 2018. Available from: http://www.qchp.org.qa/en/Pages/SearchPractitionersPage.aspx.

27. QCHP. Guidelines for Pharmacists 2020 [Available from: https://www.qchp.org.qa/en/Pages/HowToRegisterToPracticeInQatar.aspx.

28. Kheir N, Fahey M. Pharmacy practice in Qatar: challenges and opportunities. South Med Rev. 2011;4(2):92-6.

29. Sadek MM, Elnour AA, Al Kalbani NM, Bhagavathula AS, Baraka MA, Aziz AM, et al. Community pharmacy and the extended community pharmacist practice roles: The UAE experiences. Saudi pharmaceutical journal : SPJ : the official publication of the Saudi Pharmaceutical Society. 2016;24(5):563-70.

30. El Hajj MS, Kheir N, Al Mulla AM, Shami R, Fanous N, Mahfoud ZR. Effectiveness of a pharmacist-delivered smoking cessation program in the State of Qatar: a randomized controlled trial. BMC Public Health. 2017;17(1):215.

31. El Hajj MS, Mahfoud ZR, Al Suwaidi J, Alkhiyami D, Alasmar AR. Role of pharmacist in cardiovascular disease-related health promotion and in hypertension and dyslipidemia management: a cross-sectional study in the State of Qatar. Journal of evaluation in clinical practice. 2016;22(3):329-40.

32. Eltorki Y, Abdallah O, Omar N, Zolezzi M. Perceptions and expectations of health care providers towards clinical pharmacy services in a mental health hospital in Qatar. Asian journal of psychiatry. 2019;42:62-6.

33. Cannon-Breland ML, Westrick SC, Kavookjian J, Berger BA, Shannon DM, Lorenz RA. Pharmacist self-reported antidepressant medication counseling. Journal of the American Pharmacists Association : JAPhA. 2013;53(4):390-9.

34. DiMatteo MR, Lepper HS, Croghan TW. Depression is a risk factor for noncompliance with medical treatment: meta-analysis of the effects of anxiety and depression on patient adherence. Archives of internal medicine. 2000;160(14):2101-7.

35. Masand PS. Tolerability and adherence issues in antidepressant therapy. Clinical therapeutics. 2003;25(8):2289-304.

36. Boerma W F, Douglas M. The role of general practice in primary health care 1998 [Available from: https://www.nivel.nl/sites/default/files/bestanden/1000376.pdf?

37. Lin EH, Von Korff M, Katon W, Bush T, Simon GE, Walker E, et al. The role of the primary care physician in patients' adherence to antidepressant therapy. Med Care. 1995;33(1):67-74.

38. Stimmel GL. How to counsel patients about depression and its treatment. Pharmacotherapy. 1995;15(6 Pt 2):100s-4s.

39. Capoccia KL, Boudreau DM, Blough DK, Ellsworth AJ, Clark DR, Stevens NG, et al. Randomized trial of pharmacist interventions to improve depression care and outcomes in primary care. American journal of health-system pharmacy : AJHP : official journal of the American Society of Health-System Pharmacists. 2004;61(4):364-72.

40. Mey A, Fowler JL, Knox K, Shum DH, Fejzic J, Hattingh L, et al. Review of community pharmacy staff educational needs for supporting mental health consumers and carers. Community Ment Health J. 2014;50(1):59-67.

41. Mey A. Optimising practice of Australian community pharmacists and support staff in mental health [Doctoral Thesis]. Australia: Griffths University; 2015.

42. Wahl OF. Mental health consumers' experience of stigma. Schizophr Bull. 1999;25(3):467-78.

43. Den Boer-Wolters D, Knol MJ, Smulders K, de Wit NJ. Frequent attendance of primary care out-of-hours services in the Netherlands: characteristics of patients and presented morbidity. Family practice. 2010;27(2):129-34.

44. Ghuloum S, Bener A, Abou-Saleh MT. Prevalence of mental disorders in adult population attending primary health care setting in Qatari population. JPMA The Journal of the Pakistan Medical Association. 2011;61(3):216-21.

45. Leutgeb R, Berger S, Szecsenyi J, Laux G. Patients with somatoform disorders: More frequent attendance and higher utilization in primary Out-of-Hours care? PLoS One. 2018;13(8):e0202546.

46. Kupfer DJ. Long-term treatment of depression. The Journal of Clinical Psychiatry. 1991;52(Suppl):28-34.

47. Rush AJ. Depression in primary care: detection, diagnosis and treatment. Agency for Health Care Policy and Research. American family physician. 1993;47(8):1776-88.

48. Malhi GS, Outhred T, Hamilton A, Boyce PM, Bryant R, Fitzgerald PB, et al. Royal Australian and New Zealand College of Psychiatrists clinical practice guidelines for mood disorders: major depression summary. The Medical journal of Australia. 2018;208(4):175-80.

49. Black E, Murphy AL, Gardner DM. Community pharmacist services for people with mental illnesses: preferences, satisfaction, and stigma. Psychiatric services (Washington, DC). 2009;60(8):1123-7.

50. Aljumah K, Hassali MA. Impact of pharmacist intervention on adherence and measurable patient outcomes among depressed patients: a randomised controlled study. BMC psychiatry. 2015;15:219.

51. McMillan SS, Kelly F, Hattingh HL, Fowler JL, Mihala G, Wheeler AJ. The impact of a person-centred community pharmacy mental health medication support service on consumer outcomes. Journal of mental health (Abingdon, England). 2018;27(2):164-73.

52. Rubio-Valera M, March Pujol M, Fernandez A, Penarrubia-Maria MT, Trave P, Lopez Del Hoyo Y, et al. Evaluation of a pharmacist intervention on patients

initiating pharmacological treatment for depression: a randomized controlled superiority trial. Eur Neuropsychopharmacol. 2013;23(9):1057-66.

53. Readdean KC, Heuer AJ, Scott Parrott J. Effect of pharmacist intervention on improving antidepressant medication adherence and depression symptomology: A systematic review and meta-analysis. Research in social & administrative pharmacy : RSAP. 2018;14(4):321-31.

54. Brook O, van Hout H, Nieuwenhuyse H, Heerdink E. Impact of coaching by community pharmacists on drug attitude of depressive primary care patients and acceptability to patients; a randomized controlled trial. Eur Neuropsychopharmacol. 2003;13(1):1-9.

55. Melton BL, Lai Z. Review of community pharmacy services: what is being performed, and where are the opportunities for improvement? Integrated pharmacy research & practice. 2017;6:79-89.

56. Rubio-Valera M, Serrano-Blanco A, Magdalena-Belio J, Fernandez A, Garcia-Campayo J, Pujol MM, et al. Effectiveness of pharmacist care in the improvement of adherence to antidepressants: a systematic review and meta-analysis. The Annals of pharmacotherapy. 2011;45(1):39-48.

57. Murphy AL, Gardner DM, Jacobs LM. Patient care activities by community pharmacists in a capitation funding model mental health and addictions program. BMC psychiatry. 2018;18(1):192.

58. Rubio-Valera M, Bosmans J, Fernandez A, Penarrubia-Maria M, March M, Trave P, et al. Cost-effectiveness of a community pharmacist intervention in patients with depression: a randomized controlled trial (PRODEFAR Study). PLoS One. 2013;8(8):e70588.

59. Giannetti V, Caley CF, Kamal KM, Covvey JR, McKee J, Wells BG, et al. Community pharmacists and mental illness: a survey of service provision, stigma, attitudes and beliefs. Int J Clin Pharm. 2018;40(5):1096-105.

60. Scheerder G, De Coster I, Van Audenhove C. Community pharmacists' attitude toward depression: a pilot study. Research in social & administrative pharmacy : RSAP. 2009;5(3):242-52.

61. WHO. WHO | The World Health Report Chapter 1: A public health approach to mental health 2001 [Available from: https://www.who.int/whr/2001/en/.

62. Scheerder G, De Coster I, Van Audenhove C. Pharmacists' role in depression care: a survey of attitudes, current practices, and barriers. Psychiatric services (Washington, DC). 2008;59(10):1155-60.

63. O'Reilly CL, Bell JS, Chen TF. Pharmacists' beliefs about treatments and outcomes of mental disorders: a mental health literacy survey. The Australian and New Zealand journal of psychiatry. 2010;44(12):1089-96.

64. Al-Arifi MN. Community pharmacists attitudes towards mental illness and providing pharmaceutical care for mentally ill patients. Neurosciences (Riyadh, Saudi Arabia). 2008;13(4):412-20.

65. Zolezzi M. Healthcare Practitioners' Views of their Role in Addressing the Medical Comorbidites of People with Mental Illness. International Journal of Psychiatry and Psychiatric Disorders. 2020;4:31-44.

66. Scheerder G, Van Audenhove C, Arensman E, Bernik B, Giupponi G, Horel AC, et al. Community and health professionals' attitude toward depression: a pilot study in nine EAAD countries. The International journal of social psychiatry. 2011;57(4):387-401.

67. Nordt C, Rossler W, Lauber C. Attitudes of mental health professionals toward people with schizophrenia and major depression. Schizophr Bull. 2006;32(4):709-14.

68. Nazar ZJ, Nazar H, White S, Rutter P. A systematic review of the outcome data supporting the Healthy Living Pharmacy concept and lessons from its implementation. PLoS One. 2019;14(3):e0213607.

69. Cooper RJ, Tsoneva J. Benefits and tensions in delivering public health in community pharmacies - a qualitative study of healthy living pharmacy staff champions. The International journal of pharmacy practice. 2017;25(5):351-7.

70. Coppens E, Van Audenhove C, Iddi S, Arensman E, Gottlebe K, Koburger N, et al. Effectiveness of community facilitator training in improving knowledge, attitudes, and confidence in relation to depression and suicidal behavior: results of the OSPI-Europe intervention in four European countries. J Affect Disord. 2014;165:142-50.

71. Liekens S, Smits T, Laekeman G, Foulon V. A depression training session with consumer educators to reduce stigmatizing views and improve pharmacists' depression care attitudes and practices. Am J Pharm Educ. 2013;77(6):120.

72. Bener A, Dafeeah EE, Chaturvedi SK, Bhugra D. Somatic symptoms in primary care and psychological comorbidities in Qatar: neglected burden of disease. Int Rev Psychiatry. 2013;25(1):100-6.

73. WHO. QATAR HEALTH PROFILE 2016 [Available from: http://applications.emro.who.int/dsaf/EMROPUB_2016_EN_18927.pdf?ua=1.

74. HMC. Community-Based Mental Healthcare Center [Available from: https://www.hamad.qa/EN/news/2016/March/Pages/Community-Based-Mental-Healthcare-Center-officially-opens-at-HMC.aspx.

75. Ibrahim MI, Palaian S, Al-Sulaiti F, El-Shami S. Evaluating community pharmacy practice in Qatar using simulated patient method:acute gastroenteritis management. Pharmacy practice. 2016;14(4):800.

76. El Hajj MS, Hamid Y. Breast cancer health promotion in Qatar: a survey of community pharmacists' interests and needs. Int J Clin Pharm. 2011;33(1):70-9.

77. El Hajj MS, Abu Yousef SE, Basri MA. Diabetes care in Qatar: a survey of pharmacists' activities, attitudes and knowledge. Int J Clin Pharm. 2018;40(1):84-93.

78. Javed B, Kheir N, Yousif A. Patient Counseling Practices among Community Pharmacists in Qatar. 2016;2016(1).

79. Bener A, Ghuloum S, Al-Mulla AA, Al-Marri S, Hashim MS, Elbagi IE. Prevalence of somatisation and psychologisation among patients visiting primary health care centres in the State of Qatar. Libyan J Med. 2010;5.

80. Griffiths KM, Christensen H, Jorm AF. Predictors of depression stigma. BMC psychiatry. 2008;8:25.

81. Herbert C, Winkler H, Moore TA. Outcomes of mental health pharmacist-managed electronic consults at a Veterans Affairs health care system. The mental health clinician. 2017;7(3):131-6.

82. Babar Z-U-D. Encyclopedia of pharmacy practice and clinical pharmacy 2019 20th June 2019.

83. El Hajj MS, Al Nakeeb RR, Al-Qudah RA. Smoking cessation counseling in Qatar: community pharmacists' attitudes, role perceptions and practices. Int J Clin Pharm. 2012;34(4):667-76.

84. Scott DM. Assessment of pharmacists' perception of patient care competence and need for training in rural and urban areas in North Dakota. The Journal of rural

health : official journal of the American Rural Health Association and the National Rural Health Care Association. 2010;26(1):90-6.

85. Alshammari AHNA. Improving Community Pharmacy Consultations for People with Depression 2015.

86. Alzubaidi H, Saidawi W, Mc Namara K. Pharmacist views and pharmacy capacity to deliver professional services in the United Arab Emirates. Int J Clin Pharm. 2018.

87. Botega N, Mann A, Blizard R, Wilkinson G. General practitioners and depression—First use of the Depression Attitude Questionnaire. International Journal of Methods in Psychiatric Research. 1992;2:169-80.

88. Haddad M, Menchetti M, McKeown E, Tylee A, Mann A. The development and psychometric properties of a measure of clinicians' attitudes to depression: the revised Depression Attitude Questionnaire (R-DAQ). BMC psychiatry. 2015;15:7.

89. Priest RG, Vize C, Roberts A, Roberts M, Tylee A. Lay people's attitudes to treatment of depression: results of opinion poll for Defeat Depression Campaign just before its launch. BMJ (Clinical research ed). 1996;313(7061):858-9.

90. Bolarinwa OA. Principles and methods of validity and reliability testing of questionnaires used in social and health science researches. Niger Postgrad Med J. 2015;22(4):195-201.

91. Rickles NM, Dube GL, McCarter A, Olshan JS. Relationship between attitudes toward mental illness and provision of pharmacy services. Journal of the American Pharmacists Association : JAPhA. 2010;50(6):704-13.

92. Khaled SM, Gray R. Depression in migrant workers and nationals of Qatar: An exploratory cross-cultural study. The International journal of social psychiatry. 2019;65(5):354-67.

93. Phimarn W, Kaewphila P, Suttajit S, Saramunee K. Depression screening and advisory service provided by community pharmacist for depressive students in university. SpringerPlus. 2015;4:470.

94. NJ H. Dillman DA. Mail and internet surveys the tailored design method. 2nd Edition ed: John Wiley & Sons; 2007.

95. Fagerland MW, Sandvik L, Mowinckel P. Parametric methods outperformed non-parametric methods in comparisons of discrete numerical variables. BMC Med Res Methodol. 2011;11:44.

96. Masconi KL, Matsha TE, Echouffo-Tcheugui JB, Erasmus RT, Kengne AP. Reporting and handling of missing data in predictive research for prevalent undiagnosed type 2 diabetes mellitus: a systematic review. Epma j. 2015;6(1):7.

97. WHO. WHO | Definition of regional groupings 2020 [Available from: https://www.who.int/healthinfo/global_burden_disease/definition_regions/en/.

98. Kheir N, Zaidan M, Younes H, El Hajj M, Wilbur K, Jewesson PJ. Pharmacy education and practice in 13 Middle Eastern countries. Am J Pharm Educ. 2008;72(6):133.

99. Zolezzi M, Alamri M, Shaar S, Rainkie D. Stigma associated with mental illness and its treatment in the Arab culture: A systematic review. The International journal of social psychiatry. 2018;64(6):597-609.

100. Greenland S, Daniel R, Pearce N. Outcome modelling strategies in epidemiology: traditional methods and basic alternatives. Int J Epidemiol. 2016;45(2):565-75.

101. Greenland S, Pearce N. Statistical foundations for model-based adjustments. Annu Rev Public Health. 2015;36:89-108.

102. Hair Jr JF. Multivariate Data Analysis Joseph F. Hair Jr. William C. Black Barry J. Babin Rolph E. Anderson 2014 [cited 2020. Available from: https://scholar.google.com/scholar?hl=en&as_sdt=0%2C5&q=Multivariate+Data+Analysis+Joseph+F.+Hair+Jr.+William+C.+Black+Barry+J.+Babin+Rolph+E.+Anderson+Seventh+Edition&btnG=.

103. Kypri K, Samaranayaka A, Connor J, Langley JD, Maclennan B. Non-response bias in a web-based health behaviour survey of New Zealand tertiary students. Prev Med. 2011;53(4-5):274-7.

104. Vicente P, Reis E. Using Questionnaire Design to Fight Nonresponse Bias in Web Surveys. Social Science Computer Review. 2010;28(2):251-67.

105. Jiang W, Ha, L., Abuljadail, M., & Alsulaiman, S. . Item Non-response of Different Question Types and Formats in Mixed-mode Surveys: A Case Study of a Public Broadcasting TV Station's members. 2017 [cited 2020. Available from: https://www.semanticscholar.org/paper/Item-Non-response-of-Different-Question-Types-and-A-Jiang-Ha/215fc328e8e95e97d8ed5e3ab6fbdfc58f52cce5.

106. Paravattil B, Kheir N, Yousif A. Utilization of simulated patients to assess diabetes and asthma counseling practices among community pharmacists in Qatar. Int J Clin Pharm. 2017;39(4):759-68.

107. Aldahmashi T, Almanea A, Alsaad A, Mohamud M, Anjum I. Attitudes towards depression among non-psychiatric physicians in four tertiary centres in Riyadh. Health Psychol Open. 2019;6(1):2055102918820640.

108. Zolezzi M, Bensmail N, Zahrah F, Khaled SM, El-Gaili T. Stigma associated with mental illness: perspectives of university students in Qatar. Neuropsychiatric Disease and Treatment. 2017;13:1221-33.

109. Abi Doumit C, Haddad C, Sacre H, Salameh P, Akel M, Obeid S, et al. Knowledge, attitude and behaviors towards patients with mental illness: Results from a national Lebanese study. PLoS One. 2019;14(9):e0222172.

110. Vally Z. Mental health stigma continues to impede help-seeking and self-care efforts among trainees in mental health professions. Perspectives in psychiatric care. 2019;55(2):161-2.

111. Cook TM, Wang J. Descriptive epidemiology of stigma against depression in a general population sample in Alberta. BMC psychiatry. 2010;10:29.

112. Herbert KE, Urmie JM, Newland BA, Farris KB. Prediction of pharmacist intention to provide Medicare medication therapy management services using the theory of planned behavior. Research in social & administrative pharmacy : RSAP. 2006;2(3):299-314.

113. Hasan S, Sulieman H, Chapman CB, Stewart K, Kong DC. Community pharmacy services in the United Arab Emirates. The International journal of pharmacy practice. 2012;20(4):218-25.

114. Dipaula BA, Qian J, Mehdizadegan N, Simoni-Wastila L. An elective psychiatric course to reduce pharmacy students' social distance toward people with severe mental illness. Am J Pharm Educ. 2011;75(4):72.

115. Patten SB, Remillard A, Phillips L, Modgill G, Szeto A, Kassam A, et al. Effectiveness of contact-based education for reducing mental illness-related stigma in pharmacy students. BMC Med Educ. 2012;12:120.

116. Bell JS, Whitehead P, Aslani P, Sacker S, Chen TF. Design and implementation of an educational partnership between community pharmacists and consumer educators in mental health care. Am J Pharm Educ. 2006;70(2):28.

APPENDICES

Appendix A: Survey questionnaire

1.

You are cordially invited to fill out a survey where we would like to know more regarding your professional experience with care for major depression at the level of the community pharmacy where you are currently practicing.

What your participation involves: we are asking you to answer some questions about your opinions and practices with regard to major depression. It will take about 10 minutes to complete the survey.

In recognition of your time and effort, and upon submitting this survey, you will enter a draw to be one of four winners of the latest edition of Drug Information Handbook, 2019 .

Benefits to you or to others which might be reasonably expected from this research:

This survey is part of a research study at Qatar University. By submitting this survey, you will help us study the value of expanded pharmacy services to improve pharmacy practice in this country.

Some important information that you need to know:

1. Your participation in this survey is entirely voluntary. You may withdraw from the study at any time, even if you have begun answering questions.

2. Data from this survey will be handled in a confidential manner in line with strict protection rules and guidelines of Qatar University. No information regarding your name or contact information will be disclosed.

3. This study has been approved by the Qatar University Institutional Review Board (QU-IRB 1131-E/19).

4. If you have any questions about this study, please contact Ms. Rula Shami, Qatar University, College of Health Sciences <rulashami@qu.edu.qa> (+974)44036661 or (+974)334050267 or Qatar University IRB <QU-IRB@qu.edu.qa> (+974) 4403-3333.

By clicking "submit" at the end of the survey, we understand that you have read and understood the consent form.

Section I: Pharmacist's socio-demographic and professional characteristics

First, we would like to know some basic information about you. Would you please answer the following questions to help us better interpret the survey responses?

Please select the appropriate answer for each of the questions below:

1. What is your gender?

- Female
- Male

2. What is your age (in years)? .....

3. What is your country of origin?

- Qatar
- Egypt
- India
- Jordan
- Palestine
- Philippines
- Sudan
- Syria
- Other (please specify)

4. Beside your current practice in Qatar, in which countries did you practice pharmacy previously? (Please choose all that apply)?

- Egypt
- India
- Jordan
- Syria
- Palestine
- Philippines
- Sudan
- Other GCC country (KSA, UAE, Oman, Kuwait or Bahrain)
- No previous practice outside Qatar
- Other (please specify)

5. Please indicate your highest academic qualification.

- B Pharm/BSc Pharm
- M Pharm
- MSc Pharm
- Pharm D
- Ph.D.
- Other (please specify)

6. Please indicate the year of your last pharmacy degree graduation …….

7. During the last 2 years, have you attended any specialized training or continuing education (CE) activity related to any mental health topic?

- Yes
- No

If your answer is "Yes', please add more details…….

8. During the last 2 years, have you attended any training or continuing education (CE) activity related to major depression?

- Yes
- No

9. For how many years have you been practicing as a community/retail pharmacist in Qatar?

- Less than 5 years
- 5-10 years
- 11-15 years
- 16-20 years
- More than 20 years

10. Which of the following best describes your position in the pharmacy?

- Pharmacy owner
- Employee pharmacist
- Pharmacist in training
- Pharmacy manager/supervisor
- Other (please specify)

11. Which of the following best describes the community/retail pharmacy where you are currently practicing?

- Pharmacy located in a shopping mall or supermarket
- Pharmacy located in a private clinic
- Pharmacy located in a private hospital
- Pharmacy located in a gas station
- Other (please specify)

12. Based on their level of education and income (socioeconomic level), the majority

of patients/customers visiting your pharmacy generally belong to:

- Low socioeconomic class
- Middle socioeconomic class
- Upper socioeconomic class

13. The majority of patients/customers visiting your pharmacy are mainly:

- Arabs/Middle Easterners
- Asians
- Westerners (Europeans, Americans)
- A mix of all nationalities

14. On average, how many pharmacists work in your community pharmacy during one shift?

- One pharmacist
- More than one pharmacist

15. Is there a psychiatric clinic close to your pharmacy?

- Yes
- No
- I don't know

16. Do you have a private/confidential area available in your pharmacy to counsel patients (in person or over the phone)?

- Yes
- No

17. On average, how many prescriptions does your community pharmacy process on a workday?

.....

18. On average, what percentage of total prescriptions in a given week are specifically

antidepressants prescriptions?

.....

19. Have you ever suffered from major depression or any other mental illness?

- Yes
- No
- Prefer not to disclose

20. Do you have any personal experiences with major depression or any other mental illness? (e.g friend, family)?

- Yes
- No
- Prefer not to disclose

Section II: Pharmacists' practices in antidepressant management and counselling of major depression

Major depression, also known simply as depression, is a mental disorder characterized by at least two weeks of low mood and loss of interest in normally enjoyable activities.

We would like to know about your current professional practices in relation to major depression.

21. How often do you perform the following activities related to antidepressant medication management and counseling of patients who have major depression visiting your pharmacy?

Please select one appropriate answer for each question in the table below.

How often do you…

	never	rarely	sometimes	usually	always

- Provide verbal information about major depression and/or about the prescribed antidepressant drug regimen.
- Provide written information/handout/guide about major depression and/or about the prescribed antidepressant drug regimen.
- Provide information about symptoms and/or causes of major depression.
- Provide information about the purpose of the antidepressant medication.
- Provide information about the time course of response to antidepressant medication.
- Discuss options for managing possible side effects of antidepressant medication.
- Ask patients about potential barriers to taking the antidepressant(s) prescribed.
- Encourage adherence to the antidepressant regimen.
- Contact patients'physician to adjust the prescribed antidepressant regimen (change dose, remove or add additional medications)
- Follow up patients who have major depression.
- Screen patients for major depression or other mental illness
- Refer patients to trusted mental health care practitioners in the community

Section III Pharmacist's attitude towards major depression and patients with major depression.

We are interested in knowing your general attitudes towards major depression and patients with major depression.

22. Please select the appropriate box to indicate your extent of agreement with each of the below statements, in relation to what might cause major depression:

strongly disagree disagree neutral agree strongly agree

- Stressful lifestyle
- Problems with other people
- Disorder of brain metabolism
- Heredity
- Environmental poisons
- Influence of mass media
- Today's achievement oriented society (a society that overlooks failure and idealizes success)
- Negative life events (sudden dramatic life events e.g., death of a spouse, loss of a job..etc)
- Weakness of character
- Biochemical causes (neurotransmitter imbalances)
- Psychological causes (dysfunction in the state of emotion, thought and behavior)

Comments: ……...

23. Please select the appropriate box to indicate your extent of agreement with each of the below statements, in relation to major depression:

strongly disagree disagree neutral agree strongly agree

- Major depression is a real disease
- Major depression has major consequences on life.
- Anyone can suffer from major depression.
- Major depression will improve with time.
- There is a lot that patients can do to control symptoms.
- There will be periods of depression and periods of improvement.
- Antidepressant is addictive.

- Antidepressant can change one's personality.
- Major depression is a disease like any other (e.g , asthma, diabetes).
- Major depression can be treated.
- Most patients with major depression get better without treatment.

24. Please put a tick in the appropriate box to indicate your extent of agreement with each statement below, in relation to patients who suffer from major depression :

strongly disagree disagree neutral agree strongly agree

- It is easy to recognize a patient who has major depression
- Patients with major depression are at higher risk for discrimination by healthcare professionals
- Patients with major depression do not believe they need medication
- Patients with major depression do not adhere to their medication
- Patients with major depression are hard to talk to
- Patients with major depression have themselves to blame
- Patients with major depression are unreliable
- Patients with major depression need support and understanding from their environment
- Patients with major depression do not want to talk about this with a pharmacist
- Patients with major depression are less willing to be counseled by pharmacists than are patients without depression

5. **Section IV: Pharmacist attitude towards his/her role in major depression**

We are interested in knowing your general attitudes towards your role as a pharmacist in major depression counseling and medication management.

25. Please select the appropriate box to indicate your extent of agreement with each

statement below, in relation to your role in major depression care

strongly disagree disagree neutral agree strongly agree

- I believe patients with major depression do not put un-necessary strain on me.
- I should actively support the recovery efforts made by individuals who suffer from major depression.
- I should advise patients on all potential side effects of antidepressant medications.
- It is ethical for me to tell the patient what the purpose of antidepressant drug is.
- Patients with major depression generally understand the counseling information I deliver to them
- I believe that physicians do not always deliver all relevant and needed depression –related information to their patients
- I have adequate current knowledge on medication therapy for major depression.
- I make it a priority to counsel patients with major depression on the importance of adhering to their prescribed antidepressant medications
- I am comfortable to counsel patients with major depression on the importance of adhering to their prescribed antidepressant medications
- I am confident about my ability to counsel patients with major depression on the importance of adhering to their prescribed antidepressant medications
- I am interested to counsel patients with major depression on the importance of adhering to their prescribed antidepressant medications

6. **Section V: Pharmacist's perceived barriers towards his role in major depression**

We are interested in knowing more about barriers against your role as a pharmacist in major depression counselling and medication management.

26. Please select the appropriate box to indicate your agreement whether each of the statements below is a barrier that prevents you from counseling and managing medications for patients with major depression.

I agree I don't agree

- I am sensitive to ethnic/cultural differences.
- Lack of a private setting in the pharmacy.
- Lack of needed time.
- Shortage of personnel.
- Lack of clear clinical guidelines.
- Lack of access to patients' medical profiles.
- Lack of needed knowledge and training on mental health.
- Lack of patient's insight on major depression and the importance of treatment .

Please state any other barriers which you may consider but were not listed in the above:…….

27. Please feel free to write down any comments or thoughts you would like to express in relation to the care of depression at the level of community pharmacy.

…….

Now you reached the end of the survey.

Thank you for your time and effort!

Appendix B: QU IRB Approval Letter

جامعة قطر
QATAR UNIVERSITY

Qatar University Institutional Review Board
QU-IRB

September 23rd, 2019

Dr. Mohammed Fasihul Alam
Dept. of Public Health
College of Health Sciences, Qatar University
Phone: + 974 4403 4784
Email: malam@qu.edu.qa

Dear Dr. Mohammed Fasihul Alam

Sub.: Research Ethics Review Exemption/MPH student project
Ref.: Student, Rula Toufic Alchami / ra1704753@student.qu.edu.qa
Project Title: "The Role of Qatar Community Pharmacists in Depression Care: A Survey of Attitudes Practices and Perceived Barriers"

We would like to inform you that your application along with the supporting documents provided for the above MPH 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 Guidelines provided by MoPH for Research Involving Human Subjects:

Exemption Category 2: Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures or observation of public behavior, unless: (i) information obtained is recorded in such a manner that human subjects can be identified; and (ii) any disclosure of the human subjects' responses outside the research could reasonably place the subjects at risk of criminal or civil liability or be damaging to the subjects' financial standing, employability, or reputation.

Documents reviewed: scan of updated filled QU IRB Application form, updated filled QU-IRB Application Material Check List (3) (1), Thesis proposal to QU IRB_Final Draft, updated Final draft survey to QU IRB, QU-IRB Review Forms, responses to IRB queries and updated documents.

Please note that exempted projects do not require renewal; 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 1131-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. Ahmed Awaisu
Chairperson, QU-IRB

جامعة قطر
QATAR UNIVERSITY
Institutional Review Board
(IRB)
Office Of Academic Research

Appendix C: Tabulated Patterns and Numbers of Missing Values

Years since last pharmacy degree graduation	Age	Average number of daily prescriptions	Percentage of weekly prescriptions that contain antidepressants	Number of perceived barriers	Score of total attitude	# of cases*	% of cases
						184	51
		X				18	14
					X	12	5
				X	X	51	4
				X		4	3
	X					12	3
			X			15	3
X						10	2
		X		X	X	6	1
19(5.3)**	25(7.0)**	31(8.7)**	37(10.3)**	83(23.2)**	95(26.5)**		

X indicates missing values

Patterns with less than 1% cases and variables that are missing at less than 5% are not displayed in this table

*Number of participants with a specific pattern of missing data

**Number of missing values (% missing values)

Variables are sorted on missing patterns

Appendix D: Regression Diagnostics

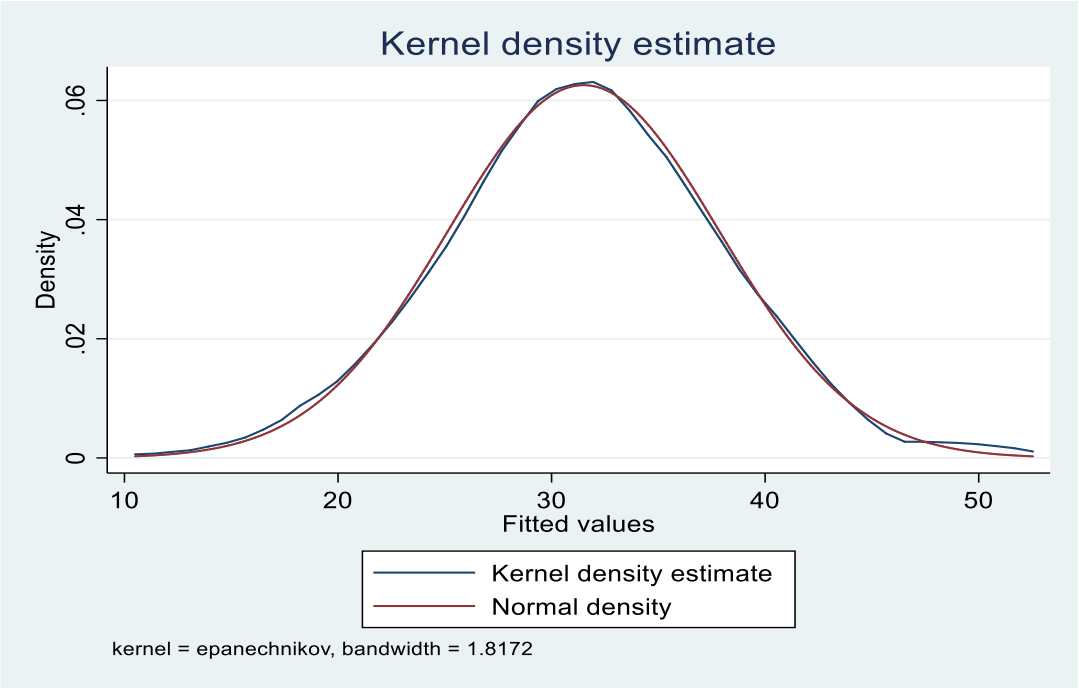

Figure 5: Kernel density plot of residuals of practice scores

Appendix E: Assessment of Non-response Bias

(Difference in the baseline characteristic between early and late responders)

Baseline Characteristic	**n %** **(First 20% of respondents)**	**n %** **(Last 20% of respondents)**	**P value**
Gender			0.17
Male	34 45.33	41 54.67	
Female	37 56.92	28 43.08	
Age (in years)			0.23
Less than30 years	24 61.54	15 38.46	
30-40 years	32 49.23	33 50.77	
Older than 40 years	12 41.38	17 58.62	
Country of origin			0.86
East Mediterranean	33 50.77	32 49.23	
South East Asian	37 49.33	38 50.67	
Country of previous practice			0.91
East Mediterranean	28 48.28	30 51.72	
South East Asian	36 50.70	35 49.30	
GCC country	6 54.55	5 45.45	
Highest Academic Degree			0.17
Undergraduate degree	59 47.97	64 52.03	
Postgraduate degree	11 68.75	5 31.25	
Years since last pharmacy degree graduation			0.70
Less than 5 years	15 57.69	11 42.31	
5-10 years	27 51.92	25 48.08	
11-15 years	11 52.38	10 47.62	
More than 15 years	16 43.24	21 56.76	
Attended any specialized training or continuing education (CE) activity related to any mental health topic during the last 2 years			0.56
No	53 51.46	50 48.54	
Yes	17 45.95	20 54.05	
Attended any specialized training or continuing			0.86

education (CE) activity related to depression during the last 2 years			
No	55 50.00	55 50.00	
Yes	14 48.28	15 51.72	
Years of experience as a community pharmacist			0.42
Less than 5 years	35 50.00	35 50.00	
5-10 years	20 46.51	23 53.49	
11-15 years	5 38.46	8 61.54	
More than 15 years	9 69.23	4 30.77	
Current position in pharmacy			0.59
Pharmacist in training	3 75.00	1 25.00	
Employee pharmacist	43 49.43	44 50.57	
Other	24 48.98	25 51.02	
Type of current community/retail pharmacy where pharmacist is practicing			0.81
Pharmacy located in a shopping mall or a supermarket	3 42.86	4 57.14	
Pharmacy located in a private clinic	9 39.13	14 60.87	
Pharmacy located in a private hospital	34 53.13	30 46.88	
Street pharmacy	17 51.52	16 48.48	
Others	7 53.85	6 46.15	
Socioeconomic class of patients visiting this pharmacy			0.84
Low socioeconomic class	8 44.44	10 55.56	
Middle socioeconomic class	41 50.00	41 50.00	
Upper socioeconomic class	20 52.63	18 47.37	
Ethnicity of patients visiting this pharmacy			0.82
Arabs/Middle Easterners	14 45.16	17 54.84	
Asians	5 50.00	5 50.00	
A mix of all nationalities	50 51.55	47 48.45	

Availability of a private/confidential area to counsel patients (in person or over the phone)			0.29
No	40 46.51	46 53.49	
Yes	29 55.77	23 44.23	
Presence of a psychiatric clinic close to the pharmacy			0.99
No	51 50.50	50 49.50	
Yes	8 50.00	8 50.00	
I don't know	10 50.00	10 50.00	
Number of pharmacists working in pharmacy during one shift			0.78
One pharmacist	50 50.00	50 50.00	
More than one pharmacist	20 52.72	18 47.37	
Average number of prescriptions processed on a workday at this pharmacy			0.002
<4	29 74.36	10 25.64	
4-8	10 43.48	13 56.52	
8-20	17 44.74	21 55.26	
>20	10 31.25	22 68.75	
Percentage of weekly prescriptions containing antidepressants			0.4
<1%	16 59.26	11 40.74	
1%-10%	36 46.75	41 53.25	
>10%	14 58.33	10 41.67	
Pharmacist ever suffered from a mental illness			0.95
No	59 49.58	60 50.42	
Yes	4 50.00	4 50.00	
Prefer not to disclose	4 44.44	5 55.56	
Pharmacist has a family member or friend with mental illness			0.45
No	46 52.87	41 47.13	
Yes	17 42.50	23 57.50	
Prefer not to disclose	3 37.50	5 62.50	

Appendix F: Comparison of the baseline characteristic of the full cohort of respondents with those of the sub-cohort which was used in the final multiple regression model.

Baseline Characteristic	**n (%) (Full cohort of respondents**	**n (%) (Sub cohort of respondents that was included in regression ,N=205)**	**P value**
Gender			0.73
Male	88 41.51	124 58.49	
Female	62 41.25	81 56.64	
Age (in years)			0.23
Less than30 years	50 42.02	69 57.98	
30-40 years	56 33.94	109 66.06	
Older than 40 years	22 44.90	27 55.10	
Country of origin			0.46
East Mediterranean	66 44.59	82 59.31	
South East Asian	83 42.33	121 57.67	
Country of previous practice			0.60
East Mediterranean	59 45.04	72 54.96	
South East Asian	80 36.60	122 60.40	
GCC country	7 38.89	11 61.11	
Highest Academic Degree			0.25
Undergraduate degree	135 42.99	179 57.01	
Postgraduate degree	13 33.33	26 66.67	
Years since last pharmacy degree graduation			0.38
Less than 5 years	24 32.43	50 67.57	
5-10 years	57 48.85	73 56.12	
11-15 years	34 36.36	42 63.64	
More than 15 years	29 42.03	40 57.97	
Attended any specialized training or continuing education (CE) activity related to any mental health topic during the last 2 years			0.37

No	120 43.32	157 56.68	
Yes	29 37.66	48 62.34	
Attended any specialized training or continuing education (CE) activity related to depression during the last 2 years			0.93
No	121 41.87	168 58.13	
Yes	26 41.27	37 58.73	
Years of experience as a community pharmacist			0.95
Less than 5 years	87 43.07	115 56.93	
5-10 years	41 40.20	61 59.80	
11-15 years	11 39.29	17 60.71	
More than 15 years	8 42.11	22 57.89	
Current position in pharmacy			0.47
Pharmacist in training	10 41.67	14 58.33	
Employee pharmacist	95 44. 39	119 55.61	
Other	43 37.39	72 62.61	
Type of current community/retail pharmacy where pharmacist is practicing			0.72
Pharmacy located in a shopping mall or a supermarket	8 53.33	7 57.14	
Pharmacy located in a private clinic	21 42.86	28 57.14	
Pharmacy located in a private hospital	74 39.15	115 60.85	
Street pharmacy	31 41.89	43 58.11	
Others	12 50.00	12 50.00	
Socioeconomic class of patients visiting this pharmacy			0.41
Low socioeconomic class	22 44.00	28 56.00	
Middle socioeconomic class	95 43.18	125 56.82	
Upper socioeconomic class	28 35.00	53 65.00	
Ethnicity of patients visiting this pharmacy			0.91
Arabs/Middle Easterners	29 39.73	44 60.27	
Asians	15 44.12	19 55.88	
A mix of all nationalities	100 41.32	142 58.68	

Availability of a private/confidential area to counsel patients (in person or over the phone)			0.16
No	88 38.43	141 61.56	
Yes	55 46.22	64 53.78	
Presence of a psychiatric clinic close to the pharmacy			0.99
No	106 41.25	151 58.75	
Yes	15 40.74	22 59.46	
I don't know	22 40.74	32 59.26	
Number of pharmacists working in pharmacy during one shift			0.85
One pharmacist	109 41.44	154 58.56	
More than one pharmacist	37 42.53	50 57.47	
Average number of prescriptions processed on a workday at this pharmacy			0.01
<4	46 48.94	48 65.75	
4-8	25 34.25	48 65.75	
8-20	52 50.98	50 49.02	
>20	17 29.31	41 70.69	
Percentage of weekly prescriptions containing antidepressants			0.26
<1%	30 44.12	38 55.88	
1%-10%	71 34.80	133 65.20	
>10%	15 30.61	34 69.39	
Pharmacist ever suffered from a mental illness			0.65
No	119 40.34	176 66.67	
Yes	13 46.43	15 53.57	
Prefer not to disclose	7 33.33	14 66.67	
Pharmacist has a family member or friend with mental illness			0.43
No	94 41.41	133 58.59	
Yes	39 41.05	56 58.95	
Prefer not to disclose	6 27.27	16 72.73	