



King Saud University

Saudi Pharmaceutical Journal

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## ORIGINAL ARTICLE

# Shortage of psychotropic medications in community pharmacies in Saudi Arabia: Causes and solutions

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Received 16 September 2016; accepted 29 October 2016

## KEYWORDS

Psychotropic;  
Medication;  
Shortage;  
Community;  
Pharmacies;  
Saudi Arabia

**Abstract** *Background:* Patients with mental disorders, such as depression and anxiety, who seek medical care in private psychiatric clinics in Riyadh, Saudi Arabia, have recently expressed concerns to doctors about difficulty in filling psychotropic medications, such as Amitriptyline and Aripiprazole, at retail community pharmacies. *Objectives:* The aim of this study was to investigate whether there is a shortage of some commonly prescribed psychotropic medications in retail community pharmacies in Saudi Arabia, and if so, to explore the possible reasons behind the shortage of these medications. *Methods:* The availability of 28 commonly prescribed psychotropic medications was checked in multiple retail community pharmacies in 4 different regions of Saudi Arabia. Further, potential reasons behind the shortage of some psychotropic medications in retail community pharmacies were also explored. *Results:* Amitriptyline, Amoxapine, Aripiprazole, Bupropion, Buspirone, Duloxetine, Haloperidol, Hydroxyzine, Lithium, Prochlorperazine, Procyclidine, Promethazine, Thioridazine, Trazodone, and Trifluoperazine were unavailable in over half of the 248 community pharmacies surveyed. Four possible reasons behind the shortage of these medications were reported by 31 pharmacists working in different retail community pharmacies' purchasing departments, with a majority (58.06%) reporting the primary reason for a shortage of these

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Peer review under responsibility of King Saud University.



Production and hosting by Elsevier

<http://dx.doi.org/10.1016/j.jsps.2016.10.013>

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Please cite this article in press as: Al-Ruthia, Y.S. et al., Shortage of psychotropic medications in community pharmacies in Saudi Arabia: Causes and solutions. Saudi Pharmaceutical Journal (2016), <http://dx.doi.org/10.1016/j.jsps.2016.10.013>

medications that they are slow-moving items with low profit margins. *Conclusions:* The findings of this study should expedite the reform process in both the Ministry of Health and the Saudi Food and Drug Authority (SFDA) to publish and enforce an essential list of medications for retail community pharmacies, which should include the most commonly prescribed psychotropic medications.

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## 1. Introduction

Until the preliminary results of the Saudi National Mental Survey are available, there are currently no accurate estimates of the prevalence of mental illness, such as depression and schizophrenia, in Saudi Arabia (Koenig et al., 2014). However, based on the most recent data published by the World Health Organization (WHO), the prevalence of mental illness is approximately 25% in both developed and under-developed nations (Mental health atlas, 2015). Moreover, some studies suggest a higher prevalence of mental illness among women, divorcees, widowed, and older adults in the Kingdom of Saudi Arabia (Koenig et al., 2014; Al-Shammari and Al-Subaie, 1999; Abdel-Fattah and Asal, 2006). In the last decade, the divorce rate has tremendously increased in the kingdom reaching up to 20% of all new marriages (AlMunajjed, 2010). Furthermore, the kingdom is surrounded by countries rife with armed conflicts and war, which puts the population at a greater risk of mental illness (Dimitry, 2012).

The financial and emotional burden of mental illness is enormous, on not only those who are ill and their loved ones, but also employers, governments, and society as a whole (Greenberg and Birnbaum, 2005; Insel, 2008; Kessler et al., 2009). Therefore, several treatment approaches have been, and are still used to manage these debilitating illnesses, such as psychotherapy and pharmacotherapy (Pinquart et al., 2006). Although some psychological interventions, such as Cognitive Behavioral Therapy (CBT), have been shown to be effective in the treatment of some mental disorders such as depression (DeRubeis et al., 2008), pharmacotherapy is used in the vast majority of mental illness cases and has also been proven to be effective (Frank et al., 2005; Hieronymus et al., 2016). As a result, the spending on psychotropic medications has increased significantly over the last 3 decades (Frank et al., 2005; Mark et al., 2005). For example, while the average U.S. spending on drugs overall grew 11.5% in 2003, the spending on antipsychotics alone grew 22.1% in same year (Frank et al., 2005). Furthermore, the demand on antidepressants in the U.S. grew by 3.4% in 2015; however, it grew only 1% for drugs overall in the same year (IMS Health, 2015).

In Saudi Arabia, there is a universal healthcare system where citizens can visit any primary care clinic or hospital that belongs to the Ministry of Health without incurring any charges (Almalki et al., 2011). Furthermore, prescribed medications for citizens are fully covered and dispensed within the same health facility in which the patient sought medical care (Almalki et al., 2011). However, many patients, especially in Muslim communities, would rather visit private facilities for their mental illness, due to the associated social stigma (Ciftci et al., 2013; Alamri, 2016). In addition, almost a third of the Saudi population are non-citizens, who do not have access to the free health care that the citizens enjoy, and have to either

buy their own health insurance, or use healthcare coverage provided by employers (Almalki et al., 2011; De Bel-Air, 2014).

The availability of psychotropic medications, such as antidepressants and antipsychotics, is essential for the initiation and continuity of patient care. Drug shortages can lead to many unexpected consequences, such as a delay of therapy, switching to another medication, and increased patient monitoring (McLaughlin et al., 2013). Recently, there have been several complaints expressed by some psychiatrists who practice in private clinics in Riyadh, Saudi Arabia. Specifically, that their patients are finding it difficult to fill prescriptions for non-controlled prescription drugs at retail community pharmacies. Thus, the current study investigated the authenticity of these complaints through determination of the availability of some highly demanded and prescribed psychotropic medications (e.g., selective serotonin reuptake inhibitors (SSRIs), serotonin-norepinephrine reuptake inhibitors (SNRIs), typical and atypical antipsychotics, and lithium) that have been reported to be in short supply in retail community pharmacies by some psychiatrists.

## 2. Methods

### 2.1. Study design and sampling plan

A cross-sectional study design was used to explore the prevalence of psychotropic drug shortage at retail community pharmacies, primarily in Riyadh, Saudi Arabia. A convenience sample of 300 community pharmacies was chosen. This method was used due to time and resource limitations; however, community pharmacies from different locations as well as from different regions were included to make the sample as representative as possible. This study was approved by the Institutional Review Board (IRB) office of the College of Pharmacy at King Saud University.

### 2.2. Data collection

Psychiatrists in private clinics were contacted and asked to provide a list of the medications that were reported to be in short supply by their patients. This list included 28 medications, which were as follows: Amitriptyline, Amoxapine, Aripiprazole, Bupropion hydrochloride (HCl), Buspirone HCl, Carbamazepine, Citalopram, Duloxetine HCl, Escitalopram, Fluoxetine, Haloperidol, Hydroxyzine HCl, Lamotrigine, Lithium, Olanzapine, Paroxetine, Prochlorperazine, Procyclidine, Promethazine, Quetiapine, Risperidone, Sertraline, Thioridazine, Topiramate, Trazodone, Trifluoperazine, Valproic acid, and Venlafaxine. Some of these medications have been listed by the World Health Organization (WHO) as essential medicines for mental disorders in primary health care

(World Health Organization, 2009). Four pharmacy interns visited 240 retail community pharmacies in the city Riyadh (central region) and contacted by phone 60 community pharmacies in the cities of Dammam and Khobar (Eastern region), Jeddah and Madinah (Western region), and Buraydah and Hail (Northern region). The pharmacy interns asked the pharmacists whether they carry any of the above-mentioned medications in their pharmacies. An electronic data collection sheet using Google® Forms was created to facilitate the data collection process. Furthermore, the pharmaceutical care department and the office responsible for the regulation and oversight of private sector in the Ministry of Health were contacted to obtain the mandatory list of psychotropic medications, if any, that must be available in any registered retail community pharmacy. For this study, psychotropic medication was regarded to be in short supply if > 50% of the visited or contacted retail community pharmacies did not carry the medication. Moreover, the office responsible for handling drug shortage reports at the Saudi Food and Drug Authority (SFDA) was contacted to determine whether any drug shortage reports concerning any of the above-mentioned psychotropic medications were received. In addition, the drug purchasing departments in 31 retail community pharmacies were contacted to explore potential reasons behind some psychotropic medications shortage at retail community pharmacies in Saudi Arabia.

### 2.3. Statistical analysis

The availability of the above-mentioned psychotropic medications was compared between chain and independent community pharmacies, as well as between the community pharmacies in the different regions, using chi-square tests and Fisher's exact tests, as appropriate. Statistical significance was determined at an  $\alpha$  of 0.05. All statistical analyses were performed using SAS version 9.2 (SAS Institute, Inc., Cary, NC, USA).

## 3. Results

Among the 300 retail community pharmacies that were visited or contacted, 248 pharmacies agreed to participate in this survey. From the 28 psychotropic medications that were checked, 15 medications were available in < 50% of the surveyed retail community pharmacies (Table 1). In addition, the chain community pharmacies were more likely to have these medications available than the independent community pharmacies (Table 1). Some medications were only available in a few of the community pharmacies in the central region, such as Thioridazine, or in 2 of the 4 surveyed regions, such as Amitriptyline and Trazodone (Table 2).

The SFDA was contacted to determine whether any of these psychotropic medications were recently reported to be in short supply, or whether they were contacted regarding the unavailability of any of these medications in community pharmacies. According to the SFDA, no reports were received from either pharmacy owners or patients. Although there are regulations governing the registration and licensing of retail community pharmacies in Saudi Arabia, these regulations do not recommend, or enforce, any list of prescription drugs that should be available in retail community pharmacies. This was

confirmed through contact of the pharmaceutical care department and the office responsible for the regulation and oversight of private sector in the Ministry of Health. Moreover, the 31 pharmacists from the purchasing departments of different retail community pharmacies who were contacted by phone reported 4 reasons behind the shortage of some psychotropic medications in retail community pharmacies in Saudi Arabia. These reasons were as follows: (1) psychotropic medications are slow moving items with low profit margin; (2) governmental regulations for purchasing and dispensing psychotropic medications are very strict, regardless of controlled status (e.g. narcotics and central nervous system stimulants); (3) procuring psychotropic medications from licensed pharmaceutical agents or wholesalers is difficult; and (4) overall high acquisition cost of psychotropic medications (Fig. 1).

## 4. Discussion

The impact of mental illness on the patients, healthcare systems, and societies overall is enormous, if left untreated (Insel, 2008; Kessler et al., 2009; Mark et al., 2005). Therefore, the availability of psychotropic medications is essential for the continuity of patient care (McLaughlin et al., 2013). Although some studies have examined the possible causes of drug shortages in general in hospital pharmacies in Saudi Arabia, and found that poor inventory management was mainly behind these shortages (Alshehri and Alshammari, 2016; AL-Aqeel et al., 2010), no study so far has examined the shortages of psychotropic medications either in hospital or in retail community pharmacies. This study explored the prevalence of shortages of some psychotropic medications, either brand or generic, in retail community pharmacies, primarily in the capital of Saudi Arabia (Riyadh), as well as in 3 other regions. Some psychotropic medications, such as Amitriptyline, Haloperidol, and Lithium, which are categorized by the WHO as essential medicines for the treatment of mental disorders in primary healthcare settings, were not available in a majority of the community pharmacies surveyed (World Health Organization, 2009). Many Saudi citizens prefer to seek medical care for their mental illness in private hospitals or clinics, due to the strongly attached social stigma of mental illness in Middle Eastern societies (Alamri, 2016). Furthermore, Saudi Arabia hosts approximately 10 million legal residents who are non-citizens (De Bel-Air, 2014). These residents do not have access to the free health care provided to citizens by the Ministry of Health affiliated hospitals, and most seek medical care in private health facilities (Almalki et al., 2011). This segment of the population with mental illness, who avoid visiting governmental health facilities either due to lack of access or due to the social stigma associated with their mental illness, are the ones primarily affected by the shortage of these medications in retail community pharmacies.

Although some studies have suggested higher customer loyalty to small independent pharmacies (Perepelkin and Di Zhang, 2011), this may not hold true all the time (Mohammadzadeh et al., 2014). For example, customer loyalty to chain community pharmacies was higher than independent pharmacies in Iran (Mohammadzadeh et al., 2014). Since the availability of medications is considered one of the most influential variables that impact customer loyalty (Bahari and Ling, 2010) this may explain the higher percentage of

**Table 1** The availability of psychotropic medications in chain and independent community pharmacies.

Medication name	Type of pharmacy		P value	Total (n = 248)
	Independent (n = 62)	Chain (n = 186)		
Amitriptyline	9(14.52%)	30(16.13%)	0.842	39(15.73%)
Amoxapine	2(3.23%)	4(2.15%)	0.641	6(2.42%)
Aripiprazole	13(20.97%)	75(40.32%)	0.005*	88(35.48%)
Bupropion	8(12.90%)	43(23.12%)	0.102	51(20.56%)
Buspirone	8(12.90%)	38(20.43%)	0.257	46(18.55%)
Carbamazepine	36(58.06%)	120(64.52%)	0.367	156(62.90%)
Citalopram	54(87.10%)	172(92.47%)	0.203	226(91.13%)
Duloxetine	21(33.87%)	93(50.00%)	0.028*	114(45.97%)
Escitalopram	50(80.65%)	172(92.47%)	0.014	222(89.52%)
Fluoxetine	47(75.81%)	166(89.25%)	0.011	213(85.89%)
Haloperidol	2(3.23%)	20(10.75%)	0.076	22(8.87%)
Hydroxyzine	6(9.68%)	11(5.91%)	0.382	17(6.85%)
Lamotrigine	28(45.16%)	132(70.97%)	0.001*	160(64.52%)
Lithium	0(0.00%)	0(0.00%)	1.00	0(0.00%)
Olanzapine	30(48.39%)	135(72.58%)	0.001*	165(66.53%)
Paroxetine	50(80.65%)	164(88.17%)	0.135	214(86.29%)
Prochlorperazine	3(4.84%)	5(2.69%)	0.416	8(3.23%)
Procyclidine	3(4.84%)	7(3.76%)	0.714	10(4.03%)
Promethazine	13(20.97%)	49(26.34%)	0.397	62(25.00%)
Quetiapine	29(46.77%)	135(72.58%)	0.001*	164(66.13%)
Risperidone	42(67.74%)	155(83.33%)	0.008*	197(79.44%)
Sertraline	27(43.55%)	134(72.04%)	< 0.001*	161(64.92%)
Thioridazine	5(8.06%)	6(3.23%)	0.1488	11(4.44%)
Topiramate	18(29.03%)	109(58.60%)	< 0.001*	127(51.21%)
Trazodone	7(11.29%)	10(5.38%)	0.143	17(6.85%)
Trifluoperazine	1(1.61%)	9(4.84%)	0.458	10(4.03%)
Valproic acid	36(58.06%)	137(73.66%)	0.020*	173(69.76%)
Venlafaxine	32(51.61%)	152(81.72%)	< 0.001*	184(74.19%)

\*  $P < 0.05$ .

chain community pharmacies that carry some of the surveyed psychotropic medications in comparison with independent pharmacies. All of the previously mentioned psychotropic medications, with the exception of Lithium, were available in variable percentages in the surveyed community pharmacies in the central region; however, some psychotropic medications were only available in the central region. This could be explained by the small number of pharmacies that were surveyed outside the central region.

The absence of any reports concerning shortages of the surveyed psychotropic medications to the SFDA suggests that the reasons behind the unavailability of some psychotropic medications in retail community pharmacies may lie within the community pharmacies themselves. Therefore, the purchasing departments in 31 different retail pharmacies were contacted to explore the potential reasons behind these shortages. Not all pharmacists who were interviewed by the phone reported the same reason behind this shortage in their community pharmacies. For example, 4 pharmacists (12.9%) reported that the cost of purchasing and storing these medications is expensive, despite the fact that these medications are uncontrolled drugs. On the other hand, 2 pharmacists (6.45%) reported that purchasing these medications from their licensed pharmaceutical agents, and receiving them within a reasonable amount of time, is difficult due to the very limited quantity that those agents have on hand. Furthermore, 7 pharmacists (22.58%) cited as a reason the strict regulations stipulated by the Ministry of Health that govern the purchase, storage, and sale of

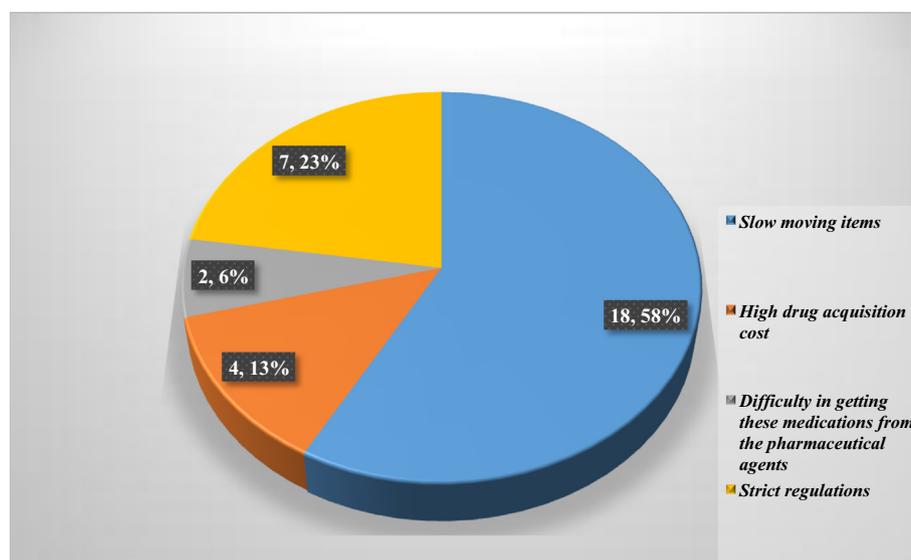
psychotropic medications, regardless of controlled status, such as narcotics. Some pharmacists expressed dissatisfaction in the fact that the Ministry of Health inspectors who visit their sites do not differentiate between uncontrolled drugs, such as antipsychotics, and the controlled drugs, such as the narcotics, and file a report against any pharmacy that does not specify the place where these medications should be kept and stored. However, the majority of the pharmacists interviewed (58.06%) reported that the main reason behind not having these medications in their pharmacies was that these medications are slow moving items with low profit margins.

The findings of this study suggest that there are multiple areas for improvement in terms of having sound and effective drug policies in Saudi Arabia. Currently, the SFDA is the governmental entity responsible for the registration of medications and handling of medication shortage reports. In addition, the Ministry of Health is responsible for the licensing of any retail community pharmacy, as well as setting and enforcing regulations that govern the work within these vital settings. In some countries, such as Ethiopia, the governmental authority responsible for food, medicine, and healthcare administration and control, alongside with the Ministry of Health, and in collaboration with the WHO, put together a list of essential medications for community pharmacies, that includes a list of essential psychotropic medications, to ensure the continuity of patient care ([List of Medicines for Community Pharmacy, 2012](#)). Unfortunately, no list of psychotropic or non-psychotropic medications for community pharmacies exists

**Table 2** The availability of psychotropic medications in community pharmacies in different regions.

Medication name	Region				P value	Total (n = 248)
	Central (n = 227)	Western (n = 10)	Eastern (n = 5)	Northern (n = 6)		
Amitriptyline	37(16.30%)	0(0.00%)	2(40.00%)	0(0.00%)	0.180	39(15.73%)
Amoxapine	5(2.20%)	0(0.00%)	1(20.00%)	0(0.00%)	0.162	6(2.42%)
Aripiprazole	75(33.04%)	8(80.00%)	2(40.00%)	3(50.00%)	0.014*	88(35.48%)
Bupropion	43(18.94%)	6(60.00%)	2(40.00%)	0(0.00%)	0.007*	51(20.56%)
Buspirone	43(18.94%)	1(10.00%)	2(40.00%)	0(0.00%)	0.362	46(18.55%)
Carbamazepine	143(63.00%)	7(70.00%)	2(40.00%)	4(66.67%)	0.708	156(62.90%)
Citalopram	206(90.75%)	9(90.00%)	5(100.00%)	6(100.00%)	1.000	226(91.13%)
Duloxetine	100(44.05%)	9(90.00%)	3(60.00%)	2(33.33%)	0.017*	114(45.97%)
Escitalopram	201(88.55%)	10(100.00%)	5(100.00%)	6(100.00%)	0.886	222(89.52%)
Fluoxetine	193(85.02%)	10(100.00%)	5(100.00%)	5(83.33%)	0.568	213(85.89%)
Haloperidol	21(9.25%)	0(0.00%)	1(20.00%)	0(0.00%)	0.492	22(8.87%)
Hydroxyzine	15(6.61%)	1(10.00%)	1(20.00%)	0(0.00%)	0.356	17(6.85%)
Lamotrigine	145(63.88%)	8(80.00%)	3(60.00%)	4(66.67%)	0.811	160(64.52%)
Lithium	0(0.00%)	0(0.00%)	0(0.00%)	0(0.00%)	1.000	0(0.00%)
Olanzapine	152(66.96%)	9(90.00%)	2(40.00%)	2(33.33%)	0.057	165(66.53%)
Paroxetine	193(85.02%)	10(100.00%)	5(100.00%)	6(100.00%)	0.518	214(86.29%)
Prochlorperazine	8(3.52%)	0(0.00%)	0(0.00%)	0(0.00%)	1.000	8(3.23%)
Procyclidine	9(3.96%)	1(10.00%)	0(0.00%)	0(0.00%)	0.594	10(4.03%)
Promethazine	59(25.99%)	0(0.00%)	2(40.00%)	1(16.67%)	0.177	62(25.00%)
Quetiapine	150(66.08%)	8(80.00%)	4(80.00%)	2(33.33%)	0.264	164(66.13%)
Risperidone	178(78.41%)	109(100.00%)	3(60.00%)	6(100.00%)	0.129	197(79.44%)
Sertraline	146(64.32%)	9(90.00%)	5(100.00%)	1(16.67%)	0.007*	161(64.92%)
Thioridazine	11(4.44%)	0(0.00%)	0(0.00%)	0(0.00%)	1.000	11(4.44%)
Topiramate	113(49.78%)	8(80.00%)	4(80.00%)	2(33.33%)	0.124	127(51.21%)
Trazodone	15(6.61%)	0(0.00%)	2(40.00%)	0(0.00%)	0.091	17(6.85%)
Trifluoperazine	10(4.41%)	0(0.00%)	0(0.00%)	0(0.00%)	1.000	10(4.03%)
Valproic acid	157(69.17%)	7(70.00%)	4(80.00%)	5(83.33%)	0.967	173(69.76%)
Venlafaxine	168(74.01%)	9(90.00%)	4(80.00%)	3(50.00%)	0.372	184(74.19%)

\* P &lt; 0.05.

**Figure 1** Possible reasons for shortage of some psychotropic medications from the perspective of community pharmacists (n = 31).

in Saudi Arabia, let alone enforcement of such a list. Presentation and enforcement of a list of essential medications for retail community pharmacies are needed to create a balance between business and patient care. Closer cooperation and coordination are required in the future between these 2 governmental entities to ensure patient safety and continuity of care.

## 5. Limitations

This study has several limitations. First, the data were not collected in the same manner across all pharmacies. For example, retail community pharmacies in the central region were visited in-person, which was in contrast to pharmacies in the other

regions. Furthermore, the generalizability of the findings is limited due to the underrepresentation of the retail community pharmacies outside the central region. These limitations were mainly due to the limited funding that this study received.

## 6. Conclusions

The availability of essential medications is vital for patient care. In Saudi Arabia, the loose regulations that govern the licensing and work of retail community pharmacies jeopardize the continuity of patient care, especially for patients with mental illness. Such loose regulation has resulted in a shortage of certain essential medications, such as Lithium, from retail community pharmacies. Future research should examine the impact of this shortage on the lives of patients and their families. In addition, future research should explore other potential reasons behind the drug shortages, solutions to address these shortages, and the impact of any future drug policy reform to address this serious issue.

## Funding

This work was supported by the College of Pharmacy Research Center and the Deanship of Scientific Research, King Saud University (Riyadh, Saudi Arabia).

## Acknowledgments

The authors would like to extend their gratitude to Abdullah Fahad Aldeghaither, Abdulaziz Mohammed Alruwais, Abdulatif Freean Alonazi, and Warrad Dakhil-Allah Alshalwi for their work on data collection. In addition, the authors would like to thank Dr. Fahad Alosaimi from the department of psychiatry in the college of medicine at King Saud University, and Dr. Ali Almuhsin from the SFDA, for their help and support.

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