

## Pregabalin Dispensing Patterns in Amman-Jordan: an Observational Study from Community Pharmacies

Amneh Al-Husseini<sup>1</sup> MSc, Rana Abu-Farha<sup>2\*</sup> PhD, Mayyada Wazaify<sup>1</sup> PhD, Marie Claire Van Hout<sup>3</sup> PhD

1. Department of Biopharmaceutics and Clinical Pharmacy, Faculty of Pharmacy, The University of Jordan (UJ), Amman, Jordan.
2. Department of Clinical Pharmacy and Therapeutics, Faculty of Pharmacy, Applied Science Private University, Amman, Jordan.
3. Public Health Institute, Liverpool John Moore's University, United Kingdom

### **\*Address for correspondence and reprints:**

Rana Abu Farha, BPharm, MSc, PhD  
Department of Clinical Pharmacy and Therapeutics, Faculty of Pharmacy  
Applied Science Private University. Amman-Jordan.  
Email: [abufarharana@yahoo.com](mailto:abufarharana@yahoo.com), [r\\_abufarha@asu.edu.jo](mailto:r_abufarha@asu.edu.jo).  
Tel: 0096265609957 ext 1496; Fax: 009625232899, PO. 11931

# **Pregabalin Dispensing Patterns in Amman-Jordan: an Observational Study from Community Pharmacies**

## **Abstract**

**Objectives:** Pregabalin is currently approved for the treatment of epilepsy, generalized anxiety disorder, neuropathic pain and fibromyalgia. Rising attention to the abuse liability of pregabalin causing addictive behaviors is partially based on case reports and published literature of pregabalin used in dosages that override the approved therapeutic range. This study was conducted to provide background data regarding the abuse/misuse of pregabalin from community pharmacy in Jordan.

**Methods:** A prospective cross-sectional observational study design was used, which was conducted at different community pharmacies in Amman-Jordan. During the study period (November 2016-January 2017), a total 77 requests for pregabalin were observed from 14 pharmacies. A structured interview was conducted with all customers to gather information regarding their demographic and their request of pregabalin.

**Results:** A total of 77 pregabalin requests from 77 customers in a community pharmacy setting were observed in this study. Spinal disc herniation was the most common complaint for which the customer asked for the medication (n= 27, 35.1%). Self-medication was the most frequent method of requesting pregabalin (n= 44 , 57.1%), while a total of 33 customers (42.9%) asked for the product using a prescription. During the observation period the number of customers suspected of abusing pregabalin for non-medical reason was 35 (45.5%). A total of 33 out of the 35 suspected customers (94.3%) asked for the product without a prescription, and 19/35 weren't sold due to suspicion of abuse (54.3%).

**Conclusion:** The study underscores the need for regulatory efforts to manage pregabalin abuse, through the addition of pregabalin containing products to the controlled drug list which can't be

purchased without a prescription. Also, pharmacists and customers must be educated at a community pharmacy level regarding potential hazards of pregabalin abuse.

**Keywords:** Pregabalin; abuse; observational study; community pharmacy; Jordan

## **1. Introduction**

Substance use disorder is a group of behavioral, cognitive and physiological symptoms resulting from applying the substance continuously despite significant negative effects (Kerridge *et al.*,

2017). It may result as a consequence of drug abuse and misuse. “Misuse” is a broad term which comprises many different forms of problematic consumption where the use of the substance does not follow medical instructions (Bronstein *et al.*, 2011; Casati *et al.*, 2012) while the term “abuse” refer to situation where the substance be used for nontherapeutic purposes to obtain psychotropic effects (Cicero *et al.*, 2007). By definition, any medication can be misused, but only few have the abuse potential, such as those with mind-altering or body-shaping properties (Cooper 2013).

The risks of addiction to prescription drugs rise when they are used in means other than prescribed (e.g. at higher doses, by other routes of administration, or mixed with alcohol or other drugs) (NIDA 2014). The most commonly reported prescription medications to be abused worldwide are stimulants such as methylphenidate, central nervous system depressants such as sedatives (benzodiazepines) or some anticonvulsants like clonazepam (NIDA 2014) or pregabalin (Loftus and Wright 2014).

Pregabalin is an analogue of the gamma-aminobutyric acid mammalian neurotransmitter. They act as inhibitory modulators of neuronal excitability that reduce ectopic neuronal activation of hyperexcited neurons while normal activation remains unaffected (Papazisis and Tzachanis 2014). Pregabalin is approved for the treatment of partial epilepsy; generalized anxiety disorder; peripheral and central neuropathic pain and fibromyalgia with an accepted dosage range of 150 to 600 mg/day (Papazisis and Tzachanis 2014).

In Jordan, like other countries in the region, with the exception of controlled drugs, it is possible to buy any medicine without a prescription. This availability linked with relatively low price products and availability of pharmacies is speculated to lead to abuse of a wide vriety of OTC and prescription drugs (Albsoul-Younes *et al.*, 2010). In 2014 a study was conducted by Wazaify et

al. to document any change that may have happened in the type and frequency of suspected abuse/misuse of medications that can be bought without prescription from community pharmacies in Jordan (Wazaify *et al.*, 2017a). A recent concerning trend was the abuse of the anticonvulsant drug (pregabalin), which obtained from pharmacies without a prescription and was not been mentioned previously in Jordan (Wazaify *et al.*, 2017a)

In 2014 a formal statement about the restriction of pregabalin products dispensing in Jordan appeared (JFDA 2014). This was due to the occurrence of spontaneous reports which was observed by the Jordan Food and Drugs Administration (JFDA) pharmacovigilance center regarding pregabalin abuse containing products. Pregabalin containing products were placed on the list of restricted drugs use that require a medical prescription to dispense it. This list includes drugs with abuse liability, but not competent to be under scheduled controlled drugs (JFDA 2014). But unfortunately, it is still possible to get such medications easily without fearing of legal accountability.

In 2017 another announcement was released in Jordan to emphasize the obligation on not to supply samples of drugs containing this substance or grant quantities of incentives on the quantities sold of this medicine (JFDA 2017). Despite this announcement the pregabalin products still can be sold without a prescription and without fear of any legal accountability. So efforts are needed to support the addition of this drug to the controlled drug list (which can't be purchased without prescription in Jordan). In order to support this requirement, we aimed in this observational study to provide background data regarding the abuse/misuse of pregabalin products in a community pharmacy setting in Jordan. Up to the researchers' knowledge, this is the first study of its kind in Jordan to address this issue.

## **2. Methods**

### **2.1 Study design, setting and subjects**

The study was designed as a prospective cross-sectional observational study that was conducted at different community pharmacies in Amman, the capital of Jordan. Two researchers interviewed all customers of a number of community pharmacies asking for pregabalin products during the observational period (November 2016-January 2017). Customers verbally consenting to be interviewed.

A convenience sampling technique was used to select the involved pharmacies. This was based on the feasibility, geographical proximity to the researchers housing, and upon consenting to participate by the pharmacy manager of each community pharmacy. Researchers took every effort to cover most socioeconomic regions in Amman (Dahiyat ALrasheed, Al-Jandaweel, Sweifieh, Sweileh, Khalda, Jbeiha, Sahab, Wadi-Alseir, Khrbet Alsouq, and Arjan).

### **2.2 Data collection instrument**

Researchers used a pre-tested and pre-piloted data collection form which was adopted from Wazaify et al. 2017 study (Wazaify *et al.*, 2017b). The method used in this study was a structured interview with all customers presented at the time of the survey. The data collection form was designed to gather customers information in an anonymous way without mentioning any information belonging to customers or pharmacists.

Information obtained in the interview include: 1) customers' demographic data including (age, gender and academic qualification, site of recruitment and shift of recruitment), 2) pharmacies and pharmacists information (pharmacy location, chain or independent pharmacy, pharmacists age,

gender, and experience), 3) the name of pregabalin product, quantity, indication and duration of use, 4) the way of asking for the medication (prescription, customers' request (self-medication), or pharmacist dispenses), and 5) pharmacist response with the abuser customers and the signs that led the pharmacists and the researchers to suspect them, for example (the pattern and repeated requests, customers's appearance (if he confused or related to his face), pharmacists' familiarity with customers and the quantity requested).

### **2.3 Data collection procedure**

A predetermined schedule was designed in order to observe each community pharmacy for one week. Data collection took place over November 2016-January 2017 through 14 pharmacies at different regions of Amman. Data were filled by the researchers after informing the pharmacists within pharmacies that the aim of this research was to measure the pregabalin drug misuse/abuse among customers in community pharmacies. To minimize the observers' effect (i.e. Hawthorne effect), the researchers noticed the interaction between customer and pharmacist standing beside the pharmacist on the dispensing counter, wearing lab coats. A collaboration was made between the researchers and the main pharmacists to detect the abuser customers. The data collection form was filled immediately after observations and any additional information thought to be important to the research was written at the end of the data collection form. Each researcher was the only observer in each community pharmacy.

### **2.4 Ethical Consideration**

This study was approved by Jordanian Ministry of health (Reference number: MOH REC170012). In addition, verbal consents were obtained from all pharmacists to use their demographic data. Written

and signed consent forms were obtained from the pharmacy managers for their acceptance for the study to be conducted in their pharmacies.

## **2.5 Statistical analysis**

All data were coded and entered into the Statistical Package for Social Sciences (SPSS) database (version 22) for statistical analysis (IBM Corporation, Armonk, NY, USA). Descriptive data were summarized as counts and percentages for categorical variables and mean and SD for continuous variables.

Univariate statistical analysis including chi square and Fisher exact tests were used to detect factors affecting pregabalin products selling among abuser patients. A p-value less than 0.05 was considered significant throughout the analysis.

## **3. Results**

### **3.1 Demographic characteristics of recruited pharmacists/pharmacies**

Out of nineteen pharmacies who were approached, fourteen agreed to take part in the study, resulting in a response rate of 73.6%. The reason for rejection was mainly the lack of interest of the responsible pharmacist in this kind of research. Around 86% (n= 12) of the involved pharmacies were independent pharmacies, while the remaining 14% (n= 2) were chain pharmacies. Ten pharmacies (71.4%) were located in west Amman (areas with higher socioeconomic status) and seven pharmacies (50.0%) on a main road. Most of the pharmacists working in these pharmacies were females (n=8, 57.1%) and half (n=7, 50%) aged between 20-30 years. Social



demographic details of involved pharmacists/pharmacies participating in the study are summarized in Table 1.

### **3.2 Demographic characteristics of study participants**

For the total 14 pharmacies observed for the whole study duration, a total of 77 requests were reported for pregabalin. The average number of pregabalin product requests was 5.5 product/pharmacy. All of those 77 customers were interviewed, most of whom were male (n=55, 71.4%) and between 21-40 years (n=51, 66.2%), respectively. More than one-third of customers (n=32, 41.6%) held a Bachelor degree. Most of the observations (n=72, 93.5%) were recruited from independent pharmacies and during shift B working (ie- 4pm-12am; n=53, 68.8%). No observations were made during working shift C (12am-8am) due to lack of research assistants covering this period. Demographic characteristics of customers are presented in Table 2.

### **3.3 Information regarding dispensed pregabalin products**

Various neurologic complaints were presented by observed customers during the study period. The top two complaints were spinal disc herniation (n=27, 35.1%) and chronic generalized pain (n=17, 22.1%). Eight customers (10.4%) came to pharmacies asking for a specific pregabalin product and mentioned wanting this specific medication (pregabalin) to feel the mood and get rest. Six customers (7.8%) also came to ask for specific pregabalin product and mentioned preferring the product for their psychological stress and anxiety. Several causes of the complaints were reported and included neuropathic pain, back or knee pain, muscle strain, fatigue, insomnia, and for his/her colon. Others refused to mention the complaints and argued that the product was for his/her mother or friend. A summary of complaints reported by customers is presented in Table 3.

Observed customers were divided into two groups: those requesting a specific pregabalin product by name (direct self-medication) (n= 44, 57.1%) and those presenting with a prescription of pregabalin (n= 33, 42.9%). Concerning indirect self-dispensing by pharmacists, there was no observable role of the pharmacist during the study period in prescribing pregabalin product for customers.

Regarding pregabalin products; the most commonly prescribed products were Lyrica® (n=26, 33.8%), followed by Zega® (n=16, 20.8%). From pregabalin products, Zega® was the most frequently requested by direct self-medication method (n=13/16, 81.2%). Concerning pregabalin concentrations; the most frequently prescribed concentrations were 150 mg (n=37, 48.1%), followed by 75 mg (n=30, 39.0%). Whereas 150 mg was the most concentrations requested by direct self-medication method, (n=25/37, 67.6%). A description of the pregabalin products/concentrations requested during the study are presented in Table 4.

The analysis revealed that most observed customers (n=54, 70.1%) asked specifically for pregabalin product in packs (range from one to three packs), while 23 customers (29.9%) asked specifically for one strip of pregabalin product. The total number of packs of pregabalin product requested during the study period was 63 packs.

### **3.4 Misuse/abuse evaluation among study observed customers**

Over the eight-week study period, 35 observed cases (45.5%) were suspected of pregabalin abuse. These suspected cases involved six pregabalin products of abuse; Lyrica® in ten cases, Galica® in ten cases, Zega® in nine cases, Neogaba® in three cases, Regab® in two cases, and Epigab® in one case. In these suspected cases pregabalin concentrations of abuse were 150 mg in 18 cases.

During the observation, information regarding customers suspected of abuse was collected. Almost all suspected abusers were male (32/35, 91.4%), and aged between 21-40 years (30/35, 85.7%). Most of them (33/35, 94.3%) presented no prescription and asked for the medication by name, whereas two of them (5.7%) had brought prescription to get pregabalin products.

Regarding pharmacist responses in selling the drug for suspected customers, responses were diverse; where the product was sold in 16 cases (45.7%) and not sold in remainder (n= 19, 54.3%). Among the 19 cases where the products were not sold, in 6 cases (17.1%) the pharmacist did not sell the requested product and claimed that the product was not available. In 10 cases, the pharmacist did not sell the requested product because of lack of prescription (28.6%), and in 3 cases (8.6%) the pharmacist did not sell the products because the drug was not actually in stock. Almost all customers 34/35 (97.1%) reported previously using the same drug they had requested. Customers' complaints, customers' familiarity, suspicious reasons and all the details are presented in Supplementary table S1.

### **3.5 Factors affecting pregabalin products selling among abuser patients**

The demographic details (pharmacist gender, age and year of experience, and pharmacy location, type and at which road) of pharmacists and pharmacies participating in the study did not appear to be significantly affecting the selling among abuser patients ( $p > 0.05$ ).

## **4. Discussion**

To the best of authors' knowledge, this is the first study of its kind in Jordan to prospectively observe pregabalin products abuse/misuse in community pharmacy. This study presents novel data

around the types of products and motives for pregabalin abuse in this country, and describes current methods that pharmacists use to manage such requests. Studies at present are restricted to measuring the abuse/misuse potential of pregabalin in general at different pharamcovigilance databases or by evaluating the prevalence of pregabalin abuse/misuse issue (Bossard *et al.*, 2016; Schjerning *et al.*, 2016; Schwan *et al.*, 2010; Wazaify *et al.*, 2017a).

One of the strengths of this study is the prospective observation on real cases in a community pharmacy setting. In this study customers-pharmacist interactions involving pregabalin products were observed at different community pharmacies in Amman. Among the observed customers in this study, 71.4% were males. This was similar to a German study which was conducted to measure the number of cases of pregabalin abuse or dependence, where 64% of cases were male (Gahr *et al.*, 2013).

It was found that the most common complaint reported by customers buying pregabalin from pharmacies was spinal disc herniation, followed by chronic generalized pain and neuropathic pain. In a German study, neuropathic pain was the most common medical indication for treatment with pregabalin reported by the Federal Institute for Drugs and Medical Devices database of ADR (Gahr *et al.*, 2013).

In this study, Lyrica<sup>®</sup> followed by Zega<sup>®</sup> were the most commonly dispensed pregabalin products. Lyrica<sup>®</sup> as a product liable for abuse appeared in the literature from Jordan for the first time in 2014 (Wazaify *et al.*, 2017a). It was not registered as a product liable for abuse in 2006 during the evaluation of misuse and abuse of prescription drugs in Jordan (Albsoul-Younes *et al.*, 2010). Popularity of Lyrica<sup>®</sup> may have been driven by pharmacist sales incentives. In order to tackle this

problem the JFDA released a new announcement in 2017, in particular for drug stores, not to grant incentives on the quantities sold of medicines containing pregabalin (JFDA 2017).

The most frequently dispensed concentration of pregabalin was 150 mg, followed by 75 mg. Similar finding was observed in a previous study, which aimed to characterize customers dispensed pregabalin at higher than the maximum allowed dose based on data extracted from Swedish national registers (Bodén *et al.*, 2014). In this cohort study, a higher pregabalin strengths, were the most concentrations reported (Bodén *et al.*, 2014).

Self-medication, whereby the customer requested specific medication by name without a prescription, was the most frequently reported pattern of sale in all pregabalin products (57.1%). This was similar to a Jordanian study conducted to measure self-medication patterns of all drugs supply that took place in the pharmacies, with self-medication was reported by 42.5% of Jordanians (Yousef *et al.*, 2008). It is worth mentioning that in our study there was no role of pharmacists in prescribing pregabalin by indirect self-medication, since it is classified in Jordan as a prescription only medicine that require a written prescription by a physician (JFDA 2014). This may be due to the observer effect where pharmacists may have behaved differently in the presence of the researchers.

Also, it was noted that some customers requested pregabalin (29.9%) by a strip without the outer package, which is considered illegal by JFDA (JFDA 2017). This is concerning as one of the major stabilizing influences of packaging is to maintain storage conditions and protection from moisture. That moisture can affect a product's chemical and physical stability, which lead to a change in the expiration date of a drug product, and to a change in any of a drug product performance (e.g.,

dissolution, hardness) or appearance, if the drug found without its outer package (Waterman and MacDonald 2010).

The high percentage of self-medication of pregabalin products in our study revealed a very low level of public awareness regarding safe use of this drug. Serious medical consequences such as psychotic symptoms with rhythmic EEG-changes can occur due to pregabalin product abuse/misuse (Olaizola *et al.*, 2006). The generic brand Zega<sup>®</sup> was most frequently requested product by direct self-medication method. The bio-equivalence of the generic drug from the original brand may explain the increase in demand of the generic brand of pregabalin, which are cheaper.

During the observation period of 14 pharmacies, the number of customers suspected of abusing pregabalin was 35 (45.5%). Those cases were suspected, according to the pharmacist' prior knowledge of the customer. This high suspected abuse rate may have arisen since these medications are not scheduled as drugs of abuse by JFDA (JFDA 2014), as well as the customer can get such medications easily without fearing of legal accountability. Selling pregabalin to suspected abused was not found to be associated with any pharmacy related sociodemographic characteristics.

The finding of the study should be interpreted with the two main limitations in mind. Firstly, the study was conducted in a single city at Amman, capital of Jordan, and hence the results might not be generalizable. Secondly, although every effort had been made to assure pharmacists of the confidentiality and anonymity of the study and that it is done solely for research purposes by an academic team. Still, the Hawthorn effect could not be totally negated, as some pharmacists may have behaved differently in the presence of the researchers, which may have affected the results.

## 5. Conclusion

All these findings call the attention for implementation of effective community pharmacy based interventions to raise customer, neurologist and pharmacist awareness and ultimately reduce the abuse rate of pregabalin products. Also, these findings should support the appeal for the addition of pregabalin preparations to controlled drugs list (which can't be purchased without prescription in Jordan).

## 6. Conflict of interest

None of the authors have any conflict of interest.

## 7. References

- Albsoul-Younes, A. Wazaify, M. Yousef, A.-M. and Tahaine, L. (2010), Abuse and misuse of prescription and nonprescription drugs sold in community pharmacies in Jordan. **Substance use & misuse**, 45,1319-1329.
- Bodén, R. Wettermark, B. Brandt, L. and Kieler, H. (2014), Factors associated with pregabalin dispensing at higher than the approved maximum dose. **Eur J Clin Pharmacol**, 70,197-204.
- Bossard, J.-B. Ponté, C. Dupouy, J. Lapeyre-Mestre, M. and Jouanjus, E. (2016), Disproportionality analysis for the assessment of abuse and dependence potential of pregabalin in the French Pharmacovigilance Database. **Clinical drug investigation**, 36,735-742.
- Bronstein, A.C. Spyker, D.A. Cantilena, L.R., Jr. Green, J.L. Rumack, B.H. and Dart, R.C. (2011), 2010 Annual Report of the American Association of Poison Control Centers' National Poison Data System (NPDS): 28th Annual Report. **Clin Toxicol (Phila)**, 49,910-941.
- Casati, A. Sedefov, R. and Pfeiffer-Gerschel, T. (2012), Misuse of medicines in the European Union: a systematic review of the literature. **European addiction research**, 18,228-245.
- Cicero, T.J. Dart, R.C. Inciardi, J.A. Woody, G.E. Schnoll, S. and Munoz, A. (2007), The development of a comprehensive risk-management program for prescription opioid analgesics: researched abuse, diversion and addiction-related surveillance (RADARS). **Pain Med**, 8,157-170.
- Cooper, R.J. (2013), Over-the-counter medicine abuse—a review of the literature. **Journal of Substance Use**, 18,82-107.
- Gahr, M. Freudenmann, R.W. Hiemke, C. Kölle, M.A. and Schönfeldt-Lecuona, C. (2013), Pregabalin abuse and dependence in Germany: results from a database query. **Eur J Clin Pharmacol**, 69,1335-1342.

- JFDA. (2014), Jordan Food and Drug Administration. Formal statement about the restricted dispensing of pregabalin in Jordan. <http://www.jfda.jo/EchoBusV3.0/SystemAssets/ce7e7f71-3158-4f56-92bd5ea766cbce16.jpg>.
- JFDA. (2017), Jordan Food and drug Administration. Formal statement about the restricted dispensing of pregabalin in Jordan. <http://www.jfda.jo/EchoBusV3.0/SystemAssets/2f00f42e-427b-40ba-abf493adfb8c2ad6.jpg>.
- Kerridge, B.T. Pickering, R.P. Saha, T.D. Ruan, W.J. Chou, S.P. Zhang, H. Jung, J. and Hasin, D.S. (2017), Prevalence, sociodemographic correlates and DSM-5 substance use disorders and other psychiatric disorders among sexual minorities in the United States. **Drug and alcohol dependence**, 170,82-92.
- Loftus, H. and Wright, A. (2014), Potential misuse of pregabalin and gabapentin. **BMJ**, 348,g1290.
- NIDA. (2014), National Institute on Drug Abuse. Commonly Abused Drugs Charts. Retrieved from. <https://www.drugabuse.gov/drugs-abuse/commonly-abused-drugs>.
- Olaizola, I. Ellger, T. Young, P. Bösebeck, F. Evers, S. and Kellinghaus, C. (2006), Pregabalin-associated acute psychosis and epileptiform EEG-changes. **Seizure**, 15,208-210.
- Papazisis, G. and Tzachanis, D. (2014), Pregabalin's abuse potential: a mini review focusing on the pharmacological profile. **International journal of clinical pharmacology and therapeutics**, 52,709-716.
- Schjerning, O. Pottgård, A. Damkier, P. Rosenzweig, M. and Nielsen, J. (2016), Use of Pregabalin—A Nationwide Pharmacoepidemiological Drug Utilization Study with Focus on Abuse Potential. **Pharmacopsychiatry**, 49,155-161.
- Schwan, S. Sundstrom, A. Stjernberg, E. Hallberg, E. and Hallberg, P. (2010), A signal for an abuse liability for pregabalin—results from the Swedish spontaneous adverse drug reaction reporting system. **Eur J Clin Pharmacol**, 66,947-953.
- Waterman, K.C. and MacDonald, B.C. (2010), Package selection for moisture protection for solid, oral drug products. **Journal of pharmaceutical sciences**, 99,4437-4452.
- Wazaify, M. Abood, E. Tahaineh, L. and Albsoul-Younes, A. (2017a), Jordanian community pharmacists' experience regarding prescription and nonprescription drug abuse and misuse in Jordan—An update. **Journal of Substance Use**, 22,463-468.
- Wazaify, M. Alali, M.B. Yousef, M.A. and Qammaz, S. (2017b), Ophthalmic drops abuse in community pharmacy setting: a cross-sectional study from Jordan. **Journal of Substance Use**,1-5.
- Yousef, A.-M.M. Al-Bakri, A.G. Bustanji, Y. and Wazaify, M. (2008), Self-medication patterns in Amman, Jordan. **Pharmacy World & Science**, 30,24-30.



Table 1. Social demographic details of involved pharmacists/pharmacies participating in the study (N=14)

<b>Variable</b>	<b>N</b>	<b>%</b>
<b>Age</b>		
20-30 years	7	50%
31-40 years	6	42.9%
41-50 years	0	0
>50 years	1	7.1%
<b>Gender</b>		
Male	6	42.9%
Female	8	57.1%
<b>Experience</b>		
<1 year	1	7.1%
1-5 years	3	21.4%
6-10 years	6	42.9%
>10 years	4	28.6%
<b>Type of pharmacy</b>		
Chain pharmacy	2	14.3%
Independent pharmacy	12	85.7%
<b>Location of pharmacy</b>		
East Amman (low socioeconomic status)	4	28.6%
West Amman (high socioeconomic status)	10	71.4%
<b>The road type</b>		
Main street	7	50%
Side / sub street	7	50%

Table 2. Demographic Characteristics of study Participants requesting pregabalin products from community pharmacies (N=77).

<b>Variable</b>	<b>N</b>	<b>%</b>
<b>Age</b>		
< 20 years	5	6.5%
21-40 years	51	66.2%
41-50 years	12	15.6%
50-60 years	8	10.4%
>60 years	1	1.3%
<b>Gender</b>		
Male	55	71.4%
Female	22	28.6%
<b>Academic qualification</b>		
Undergraduate	10	13%
Community colleges / Diploma	4	5.2%
Bachelor's degree	32	41.6%
High degree	1	1.3%
Don't know	30	39%
<b>Site of recruitment</b>		
Chain Pharmacy	5	6.5%
Independent pharmacy	72	93.5%
<b>Shift of recruitment</b>		
A (8am-4pm)	24	31.2%
B (4pm-12am)	53	68.8%

Table 3. Complaints presented by customers during the study period (N=77)

<b>Customer Complaints</b>	<b>N</b>	<b>%</b>
Disc	27	35.1%
Chronic Pain*	17	22.1%
Neuropathic Pain	9	11.7%
Mood and Rest	8	10.4%
Stress and Anxiety	6	7.8%
Other **	4	5.2%
Muscle strain	2	2.6%
Fatigue and Exhaustion	2	2.6%
Insomnia	1	1.3%
For Colon	1	1.3%

\*Chronic Pain: e.g. back pain, knee pain or joint pain.

\*\*Other: e.g. refuse to mention, e.g. for a family member or friend.

Table 4. Pregabalin products/concentrations used by the customers (N= 77)

Pregabalin products used by the customers			Description method of request*	
Pregabalin products	N	%	Prescription	Self-medication
Lyrica®	26	33.8%	14 (53.8%)	12 (46.2%)
Zega®	16	20.8%	3 (18.8%)	13 (81.2%)
Galica®	13	16.9%	4 (30.8%)	9 (69.2%)
Regab®	11	14.3%	7 (63.6%)	4 (36.4%)
Neogaba®	7	9.1%	3 (42.8%)	4 (57.2%)
Epigab®	4	5.2%	2 (50.0%)	2 (50.0%)
Total	77	100%	33 (42.9%)	44 (57.1%)

  

Pregabalin concentrations used by the customers			Description method of request*	
Pregabalin concentrations	N	%	Prescription	Self-medication
150 mg	37	48.1%	12 (32.4%)	25 (67.6%)
75 mg	30	39.0%	17 (56.7%)	13 (43.3%)
300 mg	9	11.7%	3 (33.3%)	6 (66.7%)
50 mg	1	1.3%	1 (100%)	0 (0%)
Total	77	100%	33 (42.9%)	44 (57.1%)

\*percentage were calculated per each row

Table S1. Details of the observed cases suspected of pregabalin drug abuse during the study (N=35)

#	Chain / Independent Pharmacy	Participant gender/age	Pregabalin product/ conc./ Quantity	Request method	Used before?	Compliant customer	by	Customer Familiarity	Pharmacist response / reason, if not sold	Suspicious reasons
1	Independent	Male 21-40 years	Galica® / 300 mg 1 strip	By customer without prescription	Yes	Back pain		Familiar	Sold the drug	Unconvincing request of the customer with apparent symptoms.
2	Independent	Male 21-40 years	Zega® / 150 mg 1 pack	By customer without prescription	Yes	Back pain for his mother		Non Familiar	The drug is not existing	Irrational story when the customer narrated it and not matched the symptoms.
3	Independent	Male Less than 20 years	Epigab® / 75 mg 1 pack	By customer without prescription	Yes	Refuse to mention for his mother		Familiar	The drug is not existing	The way of asking with appearance of concern and tension.
4	Independent	Male 21-40 years	Lyrica® / 150 mg 1 strip	By customer without prescription	Yes	To induce rest and joy		Non Familiar	The drug is not existing	The customer stated that he used Lyrica® for the purposes of abuse. Also, he expressed his willingness to bring a prescription.
5	Independent	Male 21-40 years	Galica® / 300 mg 1 strip	By customer without prescription	Yes	Muscle strain in his back		Non familiar	Refusing to sell under the pretext of the absence of a prescription	Lack of justification for using the drug in that complaint, no prescription and the pharmacist dispensed safer muscle relaxant.
6	Independent	Male 21-40 years	Lyrica® / 150 mg 1 pack	By prescription written by general doctor	Yes	Chronic pain and exhaustion		Non Familiar	Refusing to sell under the pretext of lack of medicine	The pharmacist told that prescription is irrational as it contain also Lexopam® and for young aged customer.
7	Independent	Male 21-40 years	Galica® / 300 mg 1 pack	By customer without prescription	Yes	Spinal disc		Non Familiar	Refusing to sell under the pretext of lack of medicine	Because the customer requested 2 pack of the drug urgently for traveling and he was confused when requesting the drug.

#	Chain / Independent Pharmacy	Participant gender/age	Pregabalin product/ conc./ Quantity	Request method	Used before?	Compliant customer	by	Customer Familiarity	Pharmacist response / reason, if not sold	Suspicious reasons
8	Independent	Male 21-40 years	Neogaba® / 150 mg 1 pack	By customer without prescription	Yes	Spinal disc		Non Familiar	Refusing to sell under the pretext of the absence of a prescription.	Because the customer has no prescription and young in age.
9	Independent	Male 21-40 years	Galica® / 300 mg 1 pack	By prescription written by orthopedic doctor	Yes	Spinal disc		Non Familiar	Refusing to sell under the pretext of lack of medicine	The pharmacist told that this customer has lack of clarity in the reason for using the drug, in the beginning he said he using it as hypnotic then he said for his disc.
10	Independent	Male 21-40 years	Lyrica® / 150 mg 2 pack	By customer without prescription	Yes	Spinal disc		Non Familiar	Refusing to sell under the pretext of lack of medicine	Because the pharmacist in shift B told that the customer himself stated that he used to buy the drug in high quantities, then he will sell it in expensive prices to drug abusers.
11	Independent	Male 21-40 years	Neogaba® / 75 mg 1 pack	By customer without prescription	Yes	For Insomnia		Familiar	Sold the drug	Because the customer himself stated that he used it for relaxation and to sleep.
12	Independent	Male 21-40 years	Zega® / 75 mg 1 pack	By customer without prescription	Yes	Knee pain		Non Familiar	Sold the drug	The customer told that his doctor stopped the treatment with this drug, but he can't feel rest at night without it.
13	Independent	Male 41-50 years	Lyrica® / 150 mg 1 strip	By customer without prescription	Yes	Spinal disc for his mother		Familiar	Sold the drug	The pharmacist told that this customer always come to the pharmacy and ask for Lyrica® and every time with different reason.
14	Independent	Male 21-40 years	Zega® / 150 mg 1 strip	By customer without prescription	Yes	Spinal disc for his mother		Non Familiar	Sold the drug	Because when the customer requesting the drug. He calls his friend as the drug for his mother.

#	Chain / Independent Pharmacy	Participant gender/age	Pregabalin product/ conc./ Quantity	Request method	Used before?	Compliant customer	by	Customer Familiarity	Pharmacist response / reason, if not sold	Suspicious reasons
15	Independent	Male 21-40 years	Regab <sup>®</sup> / 75 mg 1 pack	By customer without prescription	Yes	For colon		Familiar	Sold the drug	Because of unjustified use the drug for colon. As the customer stated that he improve with it.
16	Independent	Female Less than 20 years	Lyrica <sup>®</sup> / 150 mg 1 strip	By prescription written by general doctor	Yes	Refuse to mention for her sister		Non Familiar	Refusing to sell under the pretext of lack of medicine	Because of unconvincing request of the customer that the drug for her sister and young in age.
17	Independent	Male 21-40 years	Galica <sup>®</sup> / 300 mg 1 strip	By customer without prescription	Yes	Spinal disc		Familiar	Sold the drug	The pharmacist told that this customer repeatedly requesting the drug with different diagnosis.
18	Independent	Male Less than 20 years	Zega <sup>®</sup> / 75 mg 2 pack	By customer without prescription	Yes	For pain		Familiar	Sold the drug	The pharmacist told that this customer always asked for this drug in large quantities. As on the first time he came, the pharmacist refuses to sell the drug for him, when he didn't feel comfortable with the observer then after time he sold the drug for the customer.
19	Independent	Male 21-40 years	Zega <sup>®</sup> / 150 mg 3 pack	By customer without prescription	Yes	For pain		Familiar	Sold the drug	Because of requesting high quantities.
20	Independent	Male 21-40 years	Zega <sup>®</sup> / 150 mg 2 pack	By customer without prescription	Yes	Fatigue and exhaustion		Non Familiar	Refusing to sell under the pretext of the absence of a prescription	Because the drug not used for the treatment of fatigue and he requested large quantities.

#	Chain / Independent Pharmacy	Participant gender/age	Pregabalin product/ conc./ Quantity	Request method	Used before?	Compliant customer	by	Customer Familiarity	Pharmacist response / reason, if not sold	Suspicious reasons
21	Independent	Male 21-40 years	Zega® / 75 mg 1 pack	By customer without prescription	Yes	For rest		Familiar	Sold the drug	The Customer didn't clarify his disease and why he wants the medication. Unconvincing use of the drug and he just felt comfortable from the day.
22	Independent	Male Less than 20 years	Lyrice® / 75 mg 1 strip	By customer without prescription	Yes	For rest		Non Familiar	Refusing to sell under the pretext of the absence of a prescription	The way of asking, appearance and no prescription.
23	Independent	Male 21-40 years	Regab® / 75 mg 1 pack	By customer without prescription	Yes	To induce relaxation in anger episode		Familiar	Sold the drug	Because the customer used it for anger episode and he is young in age.
24	Independent	Male 21-40 years	Zega® / 150 mg 1 pack	By customer without prescription	No	To improve mood		Familiar	Refusing to sell under the pretext of the absence of a prescription	The pharmacist told that this customer is known and he requested the drug to improve his mood after his dad death.
25	Chain	Female 21-40 years	Lyrice® / 150 mg 1 pack	By customer without prescription	Yes	For mood		Non Familiar	Refusing to sell under the pretext of the absence of a prescription	The way of asking, appearance and no prescription.
26	Chain	Male 21-40 years	Lyrice® / 150 mg 1 pack	By customer without prescription	Yes	Refused to mention for his friend		Non Familiar	Refusing to sell under the pretext of the absence of a prescription	The way of asking, appearance and no prescription.
27	Chain	Male 21-40 years	Lyrice® / 75 mg 1 strip	By customer without prescription	Yes	For mood		Non Familiar	Refusing to sell under the pretext of the absence of a prescription	The way of asking, appearance and no prescription.



#	Chain / Independent Pharmacy	Participant gender/age	Pregabalin product/ conc./ Quantity	Request method	Used before?	Compliant customer	by	Customer Familiarity	Pharmacist response / reason, if not sold	Suspicious reasons
28	Independent	Male 21-40 years	Galica® / 150 mg 1 strip	By customer without prescription	Yes	Knee pain		Non Familiar	Refusing to sell under the pretext of lack of medicine	Because no scientific justification for using the drug in this customer.
29	Independent	Male 21-40 years	Lyrica® / 150 mg 1 strip	By customer without prescription	Yes	For stress and anxiety		Familiar	Sold the drug	Because there is no clear therapeutic reason for customer in using this drug. But the concern and pressure of life and this is not justified.
30	Independent	Female Less than 20 years	Galica® / 75 mg 1 strip	By customer without prescription	Yes	Psychological anxiety		Familiar	Sold the drug	The pharmacist told that this customer is repeatedly requested the drug for pain.
31	Independent	Male 21-40 years	Galica® / 150 mg 1 strip	By customer without prescription	Yes	Psychological_anxiety		Non Familiar	Refusing to sell under the pretext of the absence of a prescription	When we asking the customer about the use of this drug, his answer not convincing.
32	Independent	Male 21-40 years	Neogaba® / 150 mg 1 pack	By customer without prescription	Yes	Psychological state		Non Familiar	Refusing to sell under the pretext of the absence of a prescription	Because the customer stated that he used this drug for psychological reason.
33	Independent	Male 21-40 years	Galica® / 300 mg 1 pack	By customer without prescription	Yes	For rest and deal with other people		Non Familiar	Sold the drug	Because the customer stated that he has a psychological disorder and anxiety. That he feels better with this drug.
34	Independent	Male 21-40 years	Zega® / 150 mg 1 strip	By customer without prescription	Yes	To induce mood and rest		Familiar	Sold the drug	The pharmacist told that this customer himself stated that this drug causes him rest and good mood.

35	Independent	Male 21-40 years	Galica® / 300 mg  1 strip	By customer without prescription	Yes	Spinal disc	Non Familiar	Sold the drug	Appearance, young in age and his way of asking. In addition, when I was there, the pharmacist felt scared and told the customer to bring a prescription with him tomorrow and take his number in front of me to keep it.
----	-------------	---------------------	------------------------------------	---	-----	-------------	-----------------	---------------	--

---