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Pharmacists' knowledge of issues in pharmacotherapy of epilepsy using antiepileptic drugs: A cross-sectional study in Palestinian pharmacy practice



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ABSTRACT

Objective: Antiepileptic drugs (AEDs) are mainstay in controlling epileptic seizures. As experts in medications, pharmacists should be able to ensure accuracy of dosing regimens, explain adverse effects, and screen for and alert people with epilepsy (PWE) and their physicians to possible drug–drug interactions (DDIs). The aim of this study was to evaluate pharmacists' knowledge of issues in pharmacotherapy of epilepsy using AEDs.

Methods: This was a cross-sectional observational study conducted in the Palestinian pharmacy practice. A 10-item case-based questionnaire was used to determine actions taken by pharmacists in theoretical situations in pharmacotherapy of epilepsy. Demographic and practice details of the study participants were also collected. Scores were calculated as percentage of correct answers for each participant.

Results: The number of participants was 394. The majority (approximately 75%) identified themselves as community pharmacists. The median score was 33.4% with an IQR of 33.3. Pharmacists who received training on epilepsy and AEDs during their pharmacy degree program were 4.78-fold (95% C.I. of 1.82–12.60) more likely to score $\geq 50\%$ in the test than those who did not receive training on epilepsy and AEDs. Despite gaps in knowledge, pharmacists tended to perform the necessary action in cases of adverse effects and aggravated seizures associated with AEDs.

Conclusion: Pharmacists can play a crucial role in providing essential information on AEDs to patients and prescribers. There are many knowledge gaps that need to be filled. Specifically designed pedagogic and/or training interventions might be helpful in filling these gaps.

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1. Introduction

Epilepsy is a chronic neurological illness that is characterized by recurrent and unprovoked convulsive seizures that often start during childhood or adolescence [1]. The median prevalence rate of epilepsy estimated from 4 studies in different age groups was 7.1 per 1000 [2]. Accordingly, there are more than 65 million people with epilepsy (PWE) around the globe [2,3], of whom, 10% are living in the Middle East [4]. Although caring for women with epilepsy can be quite challenging because of women's specific issues, epidemiological studies showed that epilepsy affects both men and women equally [5].

Antiepileptic drugs (AEDs) are mainstay in controlling seizures in PWE. According to recent reports, seizures can be completely

suppressed in 70–80% of patients with new-onset epilepsy following adherence to appropriately selected AEDs [6,7]. Control over seizures can greatly improve the quality of life of PWE. Community pharmacists are one of the most accessible and trusted healthcare professionals [8]. The role of pharmacists extends beyond dispensing medications as they can provide quality essential information for patients with chronic illnesses, including PWE. In modern healthcare delivery systems, pharmacists are expected to play an important role in educating PWE about their illness, encouraging adherence to AEDs, ensuring accuracy of dosing regimens, explaining adverse effects of AEDs, and screening for and alerting PWE and their physicians to possible drug–drug interactions (DDIs) [8,9]. Failure to do so would have consequences on the health of PWE and might deteriorate the quality of their life.

In their previous studies, McAuley et al. reported that both primary healthcare physicians and PWE wanted pharmacists to play a greater role in providing healthcare services for PWE, especially in managing a complete AEDs profile, and screening for and alerting to DDIs [8,9]. Lack of knowledge and training are major barriers hampering

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pharmacists from extending their role beyond dispensing medications. Regrettably, the literature has reported many cases of lack of knowledge among healthcare professionals, including pharmacists, on issues related to AEDs [8,10–13]. Despite having good relationships with their pharmacists, PWE were not satisfied with the amount and quality of information received from their pharmacists and expected to hear more about their disease and pharmacotherapy [8]. Similarly, women reported insufficient information on women's issues in epilepsy provided by physicians [14,15].

Assessing knowledge of healthcare professionals on various aspects of healthcare services can serve as a quality measure in any healthcare delivery system. Many validated and reliable tools assessing knowledge of healthcare professionals on different aspects of pharmacotherapy of epilepsy using AEDs have been reported in the literature [10,11]. These tools served research purposes as well as assisting the design of specific pedagogic and/or training interventions to bridge gaps in knowledge of AEDs [8,16]. Tools based on multiple-choice questions were also previously used in assessing knowledge of healthcare professionals on issues in epilepsy [10–12]. Multiple-choice question-based tests are popularly used in assessing knowledge in universities, colleges, licensing, and equivalency examinations [17,18].

Despite the absence of a consensus on what constitutes sufficient knowledge of pharmacotherapy of epilepsy, it is believed that sufficient knowledge is insurmountable to provide optimal information to the patients and/or their prescribers [19]. Pharmacists with insufficient knowledge are not expected to provide optimal pharmaceutical care for the patients. So far, pharmacists practicing in Palestine were not previously assessed for their knowledge of dispensing issues of AEDs. The aim of this study was to assess the knowledge of issues in pharmacotherapy of epilepsy using antiepileptic drugs among pharmacists in the Palestinian pharmacy practice.

2. Methods

2.1. Recruitment of study participants

In this study, we recruited pharmacists who were registered and licensed to practice pharmacy in Palestine. The sample size was estimated at a 95% confidence interval (C.I.) accepting a margin of error of 5% using the sample size calculator (www.raosoft.com) for a population of nearly 6000 pharmacists practicing in Palestine. The sample size estimated for this study was 362.

2.2. Study design

This was a cross-sectional observational study conducted using a 10-item knowledge test based on a previous study [10]. The 10-item were theoretical situations in pharmacotherapy of epilepsy including emergency situations in pharmacotherapy of epilepsy, DDIs, initial dose of lamotrigine, and interpretation of blood concentration of valproic acid. Pharmacists had to respond to each theoretical case by selecting one of the following multiple choices: a) dispense, b) dispense and recommend to consult doctor upon next appointment, c) dispense after calling the doctor regarding drug–drug interaction (DDI), d) do not dispense, call the doctor and refer the patient back to change the prescription, e) do not dispense, call the doctor and urgently refer the patient to an emergency room, or f) I don't know. Respondents were awarded 1 point for each correct answer. To penalize guessing, 1/6 point was deducted for each wrong answer. Zero points were given when pharmacists selected the "I don't know" option or left the answer blank [20]. The final scores were calculated as percentage correct.

Demographic and practice information were also collected from each participant. Information on age, gender, place from where the basic pharmacy degree was obtained, number of years in practice, number of PWE seen on monthly basis, and if the participant had received

training on dispensing AEDs during pharmacy school were collected. Pharmacists were visited and invited to participate in the study in their places of work. After obtaining their verbal consents, pharmacists responded to the questionnaire in privacy. Pharmacists had to complete the questionnaire in 15 min. While responding to the questionnaire, pharmacists were not permitted to refer to any information resources.

No incentives were offered to the study participants.

2.3. Reliability of the study tool

We used the test–retest method to assess the stability of scores over a short time interval. To assess stability, 25 pharmacists were asked to respond to the questionnaire twice after allowing a short time interval between the two administrations. Scores obtained by the same respondents in both rounds were correlated and the Pearson's correlation coefficient (r) was used as indicator of the test–retest reliability. An r value of >0.80 indicated good reliability. The Cronbach's α was used as a determinant of internal consistency. Internally consistent tools should have $0.70 \leq \alpha \leq 0.95$ [21].

2.4. Ethical approval

The current study was approved by the Institutional Review Board (IRB) of An-Najah National University (IRB-12-MAY-2016). Study participants gave verbal consent before they took part in the study.

2.5. Statistical analysis

Statistical analysis was performed using IBM SPSS for Windows, version 21.0 (IBM). Assessment of normal distribution was performed using the Kolmogorov–Smirnov test. Data that were not normally distributed were expressed as medians with lower and upper quartiles. Categorical groups were compared using Pearson's Chi-Square (χ^2) test. Correlations were assessed using Spearman's rank correlation. To determine which variables were predictors of securing $\geq 50\%$ in the

Table 1
Demographic and practice characteristics of the study participants.

Variable	n	%
<i>Age (years)</i>		
<40	326	82.7
≥ 40	68.0	17.3
<i>Gender</i>		
Male	191	48.5
Female	203	51.5
<i>Place from where the basic pharmacy degree was earned</i>		
Palestine	278	70.6
Other	116	29.4
<i>Degree in pharmacy</i>		
Basic degree (BSc Pharm or Pharm.D)	368	93.4
Higher degree (MSc or PhD)	26.0	6.60
<i>Number of years in practice (years)</i>		
<5	169	42.9
≥ 5	225	57.1
<i>Practice setting</i>		
Community pharmacy	296	75.1
Others (hospital, insurance)	98.0	24.9
<i>Number of PWE seen per month</i>		
<10	269	68.3
≥ 10	125	31.7
<i>Had training on epilepsy and AEDs during pharmacy degree program</i>		
Yes	350	88.8
No	44.0	11.2

AEDs: antiepileptic drugs, BSc: Bachelor of Science, MSc: Master of Science, Pharm.D: Doctor of Pharmacy, PhD: Doctor of Philosophy, PWE: people with epilepsy.

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