



## Original article

# Effect of educational intervention on healthcare providers knowledge and perception towards pharmacovigilance: A tertiary teaching hospital experience

Rana Abu Farha<sup>a,\*</sup>, Khawla Abu Hammour<sup>b</sup>, Mai Rizik<sup>a</sup>, Rand Aljanabi<sup>a</sup>, Lina Alsakran<sup>c</sup>

<sup>a</sup> Department of Clinical Pharmacy and Therapeutics, Faculty of Pharmacy, Applied Science Private University, Amman, Jordan

<sup>b</sup> Department of Biopharmaceutics and Clinical Pharmacy, Faculty of Pharmacy, The University of Jordan, Amman, Jordan

<sup>c</sup> Department of Pharmacy and Nutrition, University of Saskatchewan, Saskatoon, Canada

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## ABSTRACT

**Objective:** Based on the theory on planned behavior, perception or attitude is found to be a well-established predictor of healthcare providers' intentions to perform different behaviors. Also, improving knowledge was proposed to affect their practice as well. In Jordan, many studies have been conducted to evaluate healthcare providers' knowledge and perception towards pharmacovigilance but no intervention or training was provided. Thus, the aim of this study was to evaluate the impact of an educational workshop on the knowledge and perception of healthcare providers towards pharmacovigilance in a Jordanian tertiary teaching hospital.

**Methods:** An interventional study conducted in Jordan University Hospital on various healthcare providers to assess their pre- and post-knowledge and perception towards pharmacovigilance and adverse drug reactions (ADRs) reporting via questionnaire before and after an educational workshop.

**Results:** Among the 200 invited healthcare providers, 150 attended the educational workshop (response rate 75.0%). Pre-workshop, healthcare providers showed an overall low knowledge score (7.8/19), where only 8.7% could define pharmacovigilance correctly. On the other hand, they showed a favorable perception score (33.6/39).

**Results:** Following educational workshop, knowledge scores significantly improved by 67.9% (P-value <0.05). A similar finding was obtained for perception scores, where perception scores significantly improved by 10.1% following workshop (P-value <0.05).

**Conclusion:** Continuous efforts are needed to implement different strategies including education modules and the provision of appropriate training programs to increase awareness and improve perception towards pharmacovigilance among healthcare providers. Future study is needed to evaluate the impact of improving knowledge and perception on ADRs reporting practice.

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## 1. Introduction

Pharmacovigilance is defined according to the World Health Organization (WHO) as "the science and activities related to the detection, assessment, understanding, and prevention of adverse

drug reactions (ADRs) or any other drug related problems" (WHO, 2002). It has been reported that ADRs are nearly the 5th largest cause of mortality in the United States of America (Lazarou et al., 1998). Jordan, with around 130 other countries, is part of the WHO pharmacovigilance program. This program started in Jordan in the year 2001 with a goal to safeguard the health of the Jordanian population through providing effective and safe medications. However, despite the best efforts, reporting of ADRs is still low (Suyagh et al., 2015). Thus, detection of serious ADRs may be delayed and consequently have a major negative impact on the health status of individuals.

The knowledge of health care providers pertaining to pharmacovigilance had major impact on the practice of pharmacovigilance. If trained, there could be a positive drive towards an

\* Corresponding author.

E-mail address: [r\\_abufarha@asu.edu.jo](mailto:r_abufarha@asu.edu.jo) (R. Abu Farha).

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increase in reporting and thereby could positively influence the safety profiles of medications. Also, perception plays an important role in affecting healthcare providers' reporting of ADRs. Previous studies revealed that inadequate awareness and perception towards ADRs reporting may ultimately affect the rate of reporting (Abu Farha et al., 2015; Suyagh et al., 2015; Abu Hammour et al., 2017).

Up to the researchers' knowledge, no interventional study was conducted in Jordan to improve healthcare providers' knowledge and perception towards pharmacovigilance and ADRs reporting process, although these interventional educational workshops were found to improve knowledge in several health issues (Figueiras et al., 2006; Shuval et al., 2007; Tabali et al., 2009; Rajesh et al., 2011). Thus, the aim of the present study was to evaluate the impact of the educational workshop on the knowledge and perception of healthcare providers towards pharmacovigilance in a Jordanian tertiary teaching hospital.

## 2. Methods

### 2.1. Settings and study subjects

This is a pre-post interventional study that was conducted at Jordan University Hospital (JUH) located in Amman-Jordan. JUH is considered as one of the first teaching hospitals at the level of the Arab World and the Middle East. It includes more than 25 specialized medical units, and has 64 specialties and subspecialties in different medical fields, with a bed capacity of 550. The study was conducted by the department of pharmacy that was running a safety program as a part of hospital continuous medical education. The aim of the program is to educate healthcare providers about different drug-safety related services, which was conducted between September-October 2016.

During the study period, and after obtaining ethical approval from the institutional review board at JUH (Reference number: <https://doi.org/10/2015/20650>), five educational workshops were conducted to educate healthcare providers about pharmacovigilance and ADRs reporting process, each workshop aimed to serve 40 healthcare providers with a target of 200 healthcare providers to be included. Healthcare providers include medical doctors, nurses and pharmacists working throughout different departments in the hospital.

### 2.2. Sampling and sample size calculation

A sample size calculation was performed using the following formula:

$$n = (Z_{\alpha/2} + Z_{\beta})^2 * (p_1(1 - p_1) + p_2(1 - p_2)) / (p_1 - p_2)^2$$

where

$Z_{\alpha/2}$  is the appropriate value from the normal distribution for the desired confidence interval

$Z_{\beta}$  is the critical value of the normal distribution for the power  $\beta$

$p_1$  is the expected pre-intervention sample proportions

$p_2$  is the expected post-intervention sample proportions.

Using  $Z_{\alpha/2} = 1.96$  (95% confidence level),  $Z_{\beta} = 1.645$  (95% power),  $p_1 = 62.5\%$  and  $p_2 = 82.25\%$  (Selvan et al., 2016), a minimum sample size of 127 healthcare providers was considered sufficient to obtain a significant difference between pre-intervention and post-intervention awareness about pharmacovigilance. A target sample size of 200 healthcare providers was approached to account for any drop-out after conducting the workshop session.

### 2.3. Study questionnaire

The study questionnaire was developed and extracted from previous research studies that evaluated healthcare providers knowledge, attitude and practice towards pharmacovigilance, with specific modifications performed to achieve the aim of this study (Suyagh et al., 2015; Abu Hammour et al., 2017). The questionnaire was peer reviewed by two academics with long experience in this research area. The questionnaire was assessed for completeness and clarity of content (content validity).

The questionnaire was structured into four sections, and each section consisted of either close-ended questions or 3-points Likert-scale statements (agree, neutral and disagree). Sections included: (1) demographic characteristics of healthcare providers, (2) knowledge about pharmacovigilance and its reporting process, (3) perception towards who holds responsibility in reporting ADRs, and (4) perception of healthcare providers towards the importance of ADRs reporting.

### 2.4. Scoring system

Respondents' knowledge about pharmacovigilance and ADRs reporting process was evaluated using 19 questions. Each response was evaluated to be either correct or incorrect. Healthcare providers were given 1 point for each correct answer and zero points for each wrong answer. A final knowledge score was calculated for each healthcare provider out of 19.

Regarding participants' attitude, the scoring system used was: agree = 3, neutral = 2, and disagree = 1. There were 7 statements for assessing healthcare providers' perception towards the responsibility in reporting ADRs, and 6 statements assessing their perception towards the importance of ADRs reporting. A maximum perception score of 39 and a minimum score of 13 could be obtained for each healthcare provider.

### 2.5. Conduct of the study

Two hundred selected healthcare providers were divided into five groups, each of 40. Healthcare providers were selected by hospital employee affairs. Accordingly, five educational workshop sessions were scheduled to cover the five groups. The study session was conducted under the supervision of five trained PharmD students, who were trained on how to administer the study questionnaires.

Prior to the beginning of each workshop session, healthcare providers were requested to fill out the study questionnaire, and were allowed 10 min to complete it and give it back to the PharmD student. This represented the baseline pre-intervention data. Following the intervention session, post-intervention questionnaires were administered immediately to healthcare providers and they were also allowed for another 10 min to complete and return the form.

### 2.6. Educational workshop

The pharmacovigilance educational workshop was a one-hour session. The workshop included a power-point presentation prepared and presented by the head of pharmacy department at JUH. The primary aim of this workshop was to enhance the awareness and knowledge among healthcare providers about pharmacovigilance and ADRs reporting process. The educational workshop covered an introduction about the definition of pharmacovigilance, ADRs definition and how to identify them, types of ADRs, and the yellow form used to report ADRs and explanation of the reporting process. This educational session was followed

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