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PHARMACISTS' KNOWLEDGE AND ATTITUDES ABOUT ADRS REPORTING AND PHARMACOVIGILANCE PRACTICE IN EGYPTIAN HOSPITALS"

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Background: *Pharmacovigilance is the practice of discovering and reducing risks associated with pharmaceutical products, as well as improving patient safety by evaluating the risk-benefit ratio of medications. The current study looked at pharmacists' knowledge, attitudes, and practices regarding ADR reporting, as well as the factors that may influence reporting.* ***Methods:*** *A cross-sectional questionnaire-based survey was conducted to collect data from 258 pharmacists from May 2020 to September 2021. A pre-designed questionnaires evaluating knowledge, attitude and practice were distributed and filled questionnaires were collected and analyzed.* ***Results:*** *More than third of pharmacists were unsure to whom ADRs reports should be reported , and about 26.36% said ADRs should be reported to the national ADR monitoring center. More than third group of pharmacists (34.11%) said that pharmacists are responsible for reporting ADRs, while (65.89%) said that all healthcare providers should report ADRs.* ***Conclusions:*** *Most pharmacists had sufficient knowledge of pharmacovigilance and maintained a positive attitude towards ADRs reporting. Education and training of ADRs reporting can be used as one of the planning strategies to improve the reporting rate. This trial is registered with ClinicalTrial.gov, number NCT05224804.*

Keywords: *pharmacists, knowledge, adverse drug reactions, reporting, pharmacovigilance.*

INTRODUCTION

The gathering, identification, monitoring, assessment, and prevention of adverse drug effects using drug products is referred to as pharmacovigilance.[1] The terms "pharmacovigilance" are derived from the Greek words pharmakon (drug) and vigilare (vigilance) (monitor or keep an eye on).[2] Pharmacovigilance (PV) is described as "the science and techniques associated to the identification, assessment, understanding, and prevention of adverse effects or other drug-related problems" by the World Health Organization (WHO).[3] PV evaluates a medicine's risk-benefit profile in order to improve patient safety. As a result, ADR reporting is the foundation of any PV system, and early detection and reporting of ADRs to regional or national drug-regulatory agencies is critical.[4]

The World Health Organization defines an adverse drug reaction (ADR) as "an unpleasant and unexpected reaction to a treatment that occurs at doses typically used in man for the prevention, diagnosis, or therapy of disease, or for the adjustment of physiological function."[5] Adverse drug reactions (ADRs) are a major public health concern connected to prolonged hospital stays and greater therapy expenditures. The rate of hospital admissions due to ADRs is between 3-5 percent, according to current systematic reviews and meta-analyses of observational literature.[6]

Healthcare professionals, particularly pharmacists, have been related to reporting ADRs for a variety of reasons. Several studies have identified reasons why observed ADRs are not reported, and pharmacists have been

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polled to identify the most important facilitators and barriers to spontaneous reporting.[7] Inman coined the term "seven deadly sins," which Lopez-Gonzalez et al.[8] described as "professional and personal attributes, as well as knowledge and attitudes toward reporting." A variety of impediments to reporting ADRs have been identified by pharmacists around the world, including lack of time, the inability to link an adverse event (AE) to a specific medicine, and the lack of readily available reporting forms[9] .

Egypt joined the WHO International Program for Drug Monitoring in 2001, but until 2009, when the Egyptian Pharmacovigilance Center (EPVC). was founded, no actual activities were taken. EPVC's tasks include receiving ADR reports, detecting safety signals, issuing frequent newsletters with PV-related updates, and performing awareness training.[10]

In Egypt, spontaneous reporting is a voluntary process in which pharmacists and other health-care professionals can send an ADR report (yellow card) to EPVC's regional satellite centres. [11] These centres act as focal points for disseminating information about the Egyptian ADRs reporting process by arranging workshops for healthcare professionals, including hospital pharmacists. Given Egypt's limited experience with PV, little is known about Egyptian pharmacist attitudes toward ADRs monitoring and the difficulties that pharmacists confront.[11]

Traditionally, pharmacist's responsibilities were limited to the preparation and administration of drugs prescribed by a doctor. The function of the pharmacist has recently expanded to cover other aspects of patient care. These responsibilities include reporting ADRs, improving patient health, and improving financial results. [12] However, in many countries, pharmacists' knowledge of pharmacovigilance and ADR reporting is insufficient, and the incidence of reporting is low.[13]

Community pharmacists' knowledge, behaviors, and experiences with regard to spontaneous reporting of ADRs must be evaluated. [14] Pharmacists can assist other healthcare providers in learning more about the ADR reporting method if they have a thorough understanding of it. As a result, the current study aimed to learn about the pharmacists' demographics, as well as their knowledge of ADR reporting, attitudes about reporting, and the factors that they considered might influence reporting.

METHODS

Study design

A cross-sectional questionnaire-based survey was conducted on pharmacists from May 2020 to September 2021 in different practice settings. A pre-designed questionnaire which was structured to obtain the demographics of the pharmacists, information about their knowledge of ADR reporting, attitudes to reporting and the perceived factors that may influence reporting. The questionnaire wording was checked by experts with specialization in pharmacovigilance, clinical pharmacy and regulatory affairs.

Ethical approval

The study protocol was approved by the faculty of pharmacy research committee at Fayoum University. Furthermore, written consent was also requested from the respondents. Questions that may disclose the personal identity of the pharmacists or pharmacies were concealed. This trial is registered with ClinicalTrial.gov, (ID number NCT05224804).

Data collection

The investigators went to the pharmacists' offices to invite them to take part in an anonymous survey that was administered by hand. The crew provided no more support or explanation in addressing the questions. On a separate front sheet, the survey provided consent to participate in the study. The respondents, as well as the volume of business when the survey was presented to them, determined how long it took them to complete the survey. The interviewing crew was advised by the participating pharmacists to ensure that all survey questions were answered completely.

Study questionnaire

A validated Knowledge, Attitude and Practices (KAP) questionnaire was used as a tool for data collection. This questionnaire consisted of three sections. The first one included pharmacist’s demographic data, the second section assessed pharmacists’ knowledge about pharmacovigilance. The final part included questions to assess pharmacists’ attitude towards ADRs reporting. The

questionnaire consisted of a total of 36 questions; 8 questions about demographic details of the participant pharmacists, 10 questions were used to measure knowledge and awareness of adverse drug reactions reporting among pharmacists and 18 questions were used to measure attitudes of pharmacists towards ADRs reporting.

Questionnaire distribution and data presentation

A total of 300 pharmacists were approached and questionnaire forms were distributed to pharmacists in different practice settings. Questionnaire was handed to them after explaining them the aim of the study. The pharmacists were asked to complete the questionnaire and hand it back after completion, Descriptive statistics including frequency and percentage was used to present the data.

Statistical Analysis

The SPSS V.25 program was used to statistically evaluate the results. Descriptive statistics include data descriptions such as mean (± SD) for quantitative data and frequency and proportion for qualitative data.

RESULTS AND DISCUSSION

Results

Sociodemographic characteristics of the respondents

A total of 258 pharmacists participated in the current study. The sociodemographic characteristics of the respondents are shown in Table (1). More than half of the participants (74.80%) were between the ages of 20 and 30. The majority of the participants (86.05%) were females, and more than half of the pharmacists (61.62%) had less than five years of experience. Almost majority of the pharmacists had a bachelor's degree, with only two (0.78%) having a master's degree and seven (2.71%) having other qualifications (diploma in pharmacy). Only almost half of the participants (47.67%) work in public hospitals, with the rest working in private hospitals (19%), medical centres (12.79%), and other settings (20.54%).

Table 1: Sociodemographic characteristics of pharmacists (N=258).

Characteristics	Number (%)
Age (years)	
20-30	193 (74.80)
31-40	60 (23.26)
41-50	5 (1.94)
>50	-
Gender	
Male	36 (13.95)
Female	222 (86.05)
Years of experience	
<5	159 (61.62)
5-9	45 (17.44)
10-20	49 (19)
>20	5 (1.94)
Qualification degree	
B.Sc	249 (96.51)
M.Sc	2 (0.78)
Ph.D	-
Others	7 (2.71)
Type of hospital/pharmacy	
Public	123(47.67)
Private	49(19)
Medical center	33(12.79)
Clinic	-
Others	53(20.54)
Residence	
City	217(84.11)
Village	40(15.50)
Rural	1(0.39)
Employment status	
Full time	173(67.05)
Part time	67(25.97)
Not working	18(6.98)

Knowledge and awareness of ADRs reporting among pharmacists

Regarding knowledge and awareness of adverse drug reaction reporting among pharmacists, responses to the ADR reporting are presented in **Table 2.** The majority of pharmacists who took part in the study (98.44%) agreed that not all medications on the market are safe, and the majority of them (87.21%) reported seeing a suspected ADR. About third of the participants (29.84%) were aware of the legislation governing ADRs reporting, and about half of the participants (44.57%) were aware that their institution had an ADRs reporting mechanism. Only 37.21% of pharmacists were aware of critical information for reporting ADRs. A third of the participants (34.50%) had previously attended

an ADRs workshop or awareness programme, while 70.93% had heard of pharmacovigilance. The existence of a national pharmacovigilance centre in Egypt was known by more than half of the pharmacists (62.79%). Only 42.64% of the pharmacists who took part in the study grasped the precise definition of pharmacovigilance. The most essential aim of pharmacovigilance, according to pharmacists, is to uncover previously undetected ADRs (32.56%), to determine the drug's safety (27.91%), to determine the occurrence of ADRs (23.26%), and to determine predisposing variables to ADRs (23.26%).

Attitudes of pharmacists towards ADRs reporting

Regarding attitudes of pharmacists towards ADRs reporting, only 13.57% of them reported a possible ADR. When asked if their institution's ADR reporting system encourages them to report more, approximately 23.26% of pharmacists said yes. Almost half of the pharmacists (50.78%) said there was a record of ADRs reported and that they were receiving sufficient feedback on their reported ADRs. The majority of pharmacists who took part in the survey (91.09%) said they counsel patients about adverse drug reactions, and they all believe that an ADR reporting system will benefit patients or improve the patient care process. ADR reporting is a requirement for 81.01 percent of pharmacists, and the majority (95.74%) believe pharmacovigilance should be taught in depth to medical undergraduate students, (Table 3).

Table 2: Knowledge and awareness of adverse drug reactions reporting among pharmacists.

Questions	Response	n (%)
Are you aware that not all drugs available in the market are safe?	Yes No Do not know	254(98.44) 2(0.78) 2(0.78)
Have you ever observed a suspected ADR?	Yes No	225(87.21) 33(12.79)
Are you aware of laws governing ADRs reporting?	Yes No	77(29.84) 181(70.16)
Are you aware of existence of ADRs reporting system at your institution?	Yes No	115(44.57) 143(55.43)
Are you aware of essential information for reporting ADRs?	Yes No	96(37.21) 162(62.79)
Have you previously attended any ADRs workshop or awareness programs?	Yes No	89(34.50) 169(65.50)
Have you previously heard of Pharmacovigilance?	Yes No	183(70.93) 75(29.07)
Are you aware of existence of national pharmacovigilance center in Egypt?	Yes No	162(62.79) 96(37.21)
Definition of Pharmacovigilance is: -The science detecting the type and incidence of ADRs after drug is marketed. -The science of monitoring ADRs occurring in a hospital. - The process of improving the safety of the drug. - The detection, assessment, understanding and prevention of adverse effects of drugs		 113(43.80) 24(9.30) 11(4.26) 110(42.64)
The most important purpose of pharmacovigilance is: -To identify safety of the drug -To identify incidence of ADRs -To identify predisposing factors to ADR's -To identify previously unrecognized ADR's		 72(27.91) 60(23.26) 42(16.27) 84(32.56)

Table 3: Attitudes of pharmacists towards ADRs reporting.

Questions	Response	n (%)
Have you ever reported a suspected ADR?	Yes No	35(13.57) 223(86.43)
If so, does the ADR reporting system exist at your institution encourage you to report further?	Yes No	60(23.26) 198(76.74)
Is there a record of ADRs reported?	Yes No	131(50.78) 127(49.22)
Are you getting proper feedback to your reported reaction?	Yes No	114(44.19) 144(55.81)
Do you counsel patients about adverse drug reactions?	Yes No	235(91.09) 23(8.91)
Do you think that ADR reporting system would benefit the patient or improve the patient care?	Yes No	256(99.22) 2(0.78)
Do you think ADRs reporting is an obligation to you?	Yes No Do not know	209(81.01) 9(3.49) 40(15.5)
Do you think pharmacovigilance should be taught in detail to medical undergraduate students?	Yes No Do not know	247(95.74) 0 11(4.26)

Frequency of ADRs reporting

More than half of pharmacists (51.94 percent) experienced ADRs only infrequently, (41.86%) encountered an ADR occasionally, and (6.20%) encountered an ADR frequently. Only 35.66% of pharmacists didn't know who to report ADRs to, and about 26.36% of pharmacists said ADRs should be reported to the national ADR monitoring centre, Figure 1.

Sources of information about ADRs and types of ADRs reporting

Figure 2 shows that around 48.45% of participants acquired information regarding ADRs from the internet, followed by textbooks (34.88%) and coworkers (20.16%). A large majority of participants (62.40%) agreed that all types of ADRs should be reported, Figure 3.

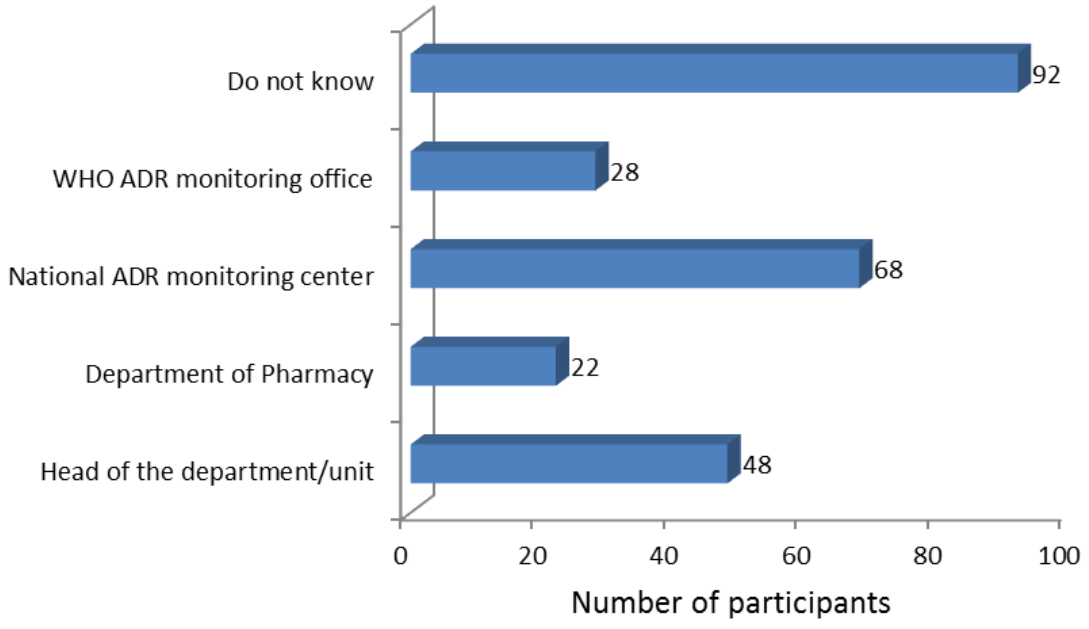

Fig. 1: Bodies of ADRs reporting.

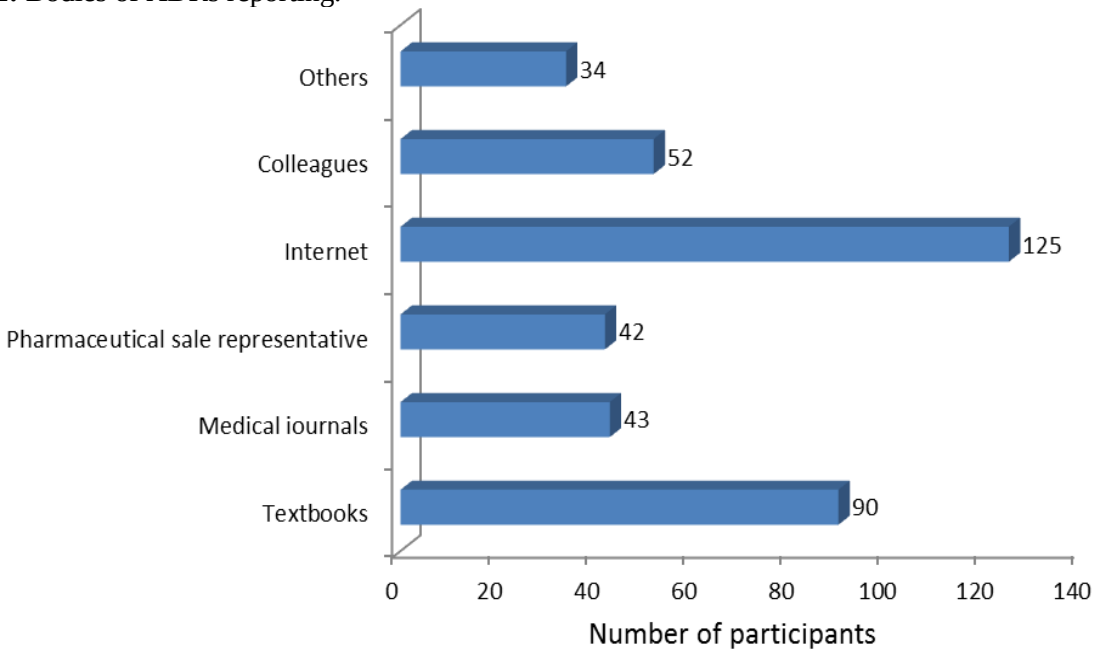

Fig. 2: Sources of information on ADRs.

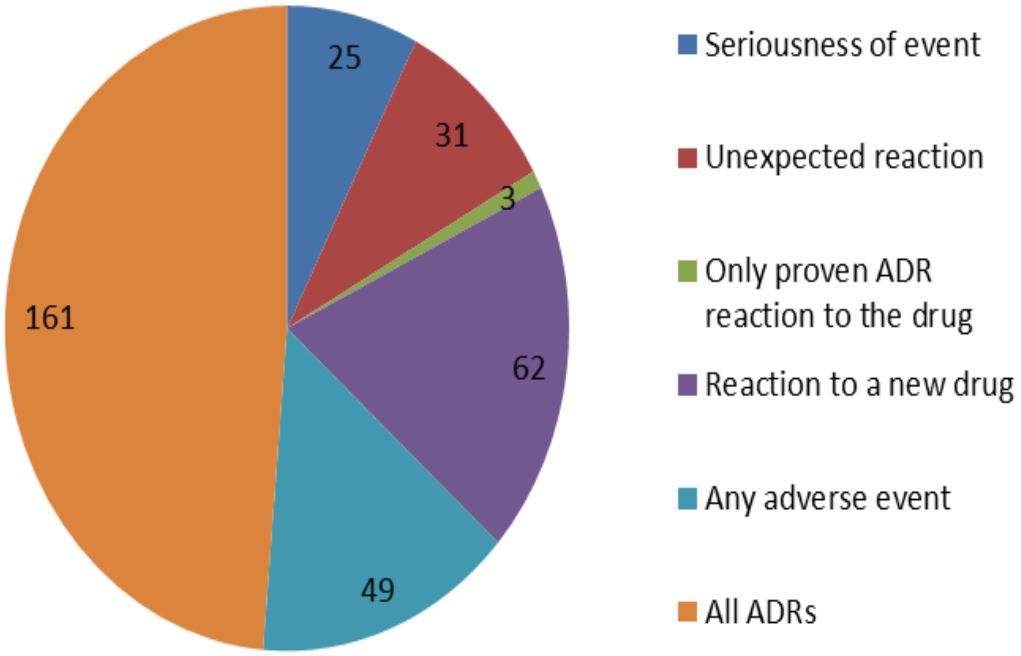

Fig. 3: Type of ADRs reporting.

Factors of ADRs reporting

The presence of an awareness environment at their institution (61.24%) and the simplicity of the reporting system's operation (40.70%) are two characteristics that pharmacists believed can motivate them to report a suspected ADR, as shown in Figure 4. The presence of administrative barriers (29.46%), a feeling that there is no benefit for reporting (27.13%), incomplete patient details (23.64%), non-availability of the ADR reporting form (21.32%), and a lack of encouragement from hospital administration were the main factors discouraging pharmacists from reporting suspected ADRs (18.99%), Figure 5.

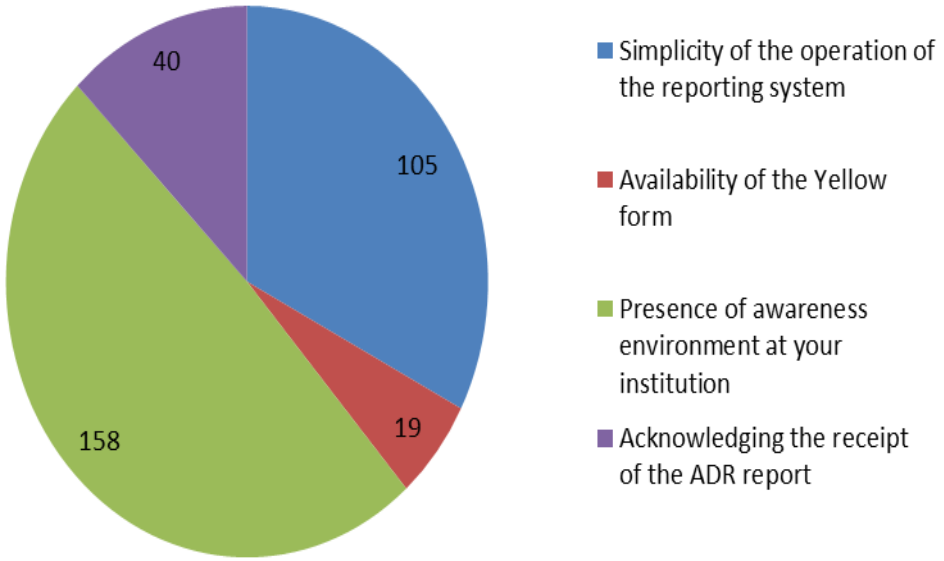

Fig. 4: Factors encouraging pharmacists to report a suspected ADR.

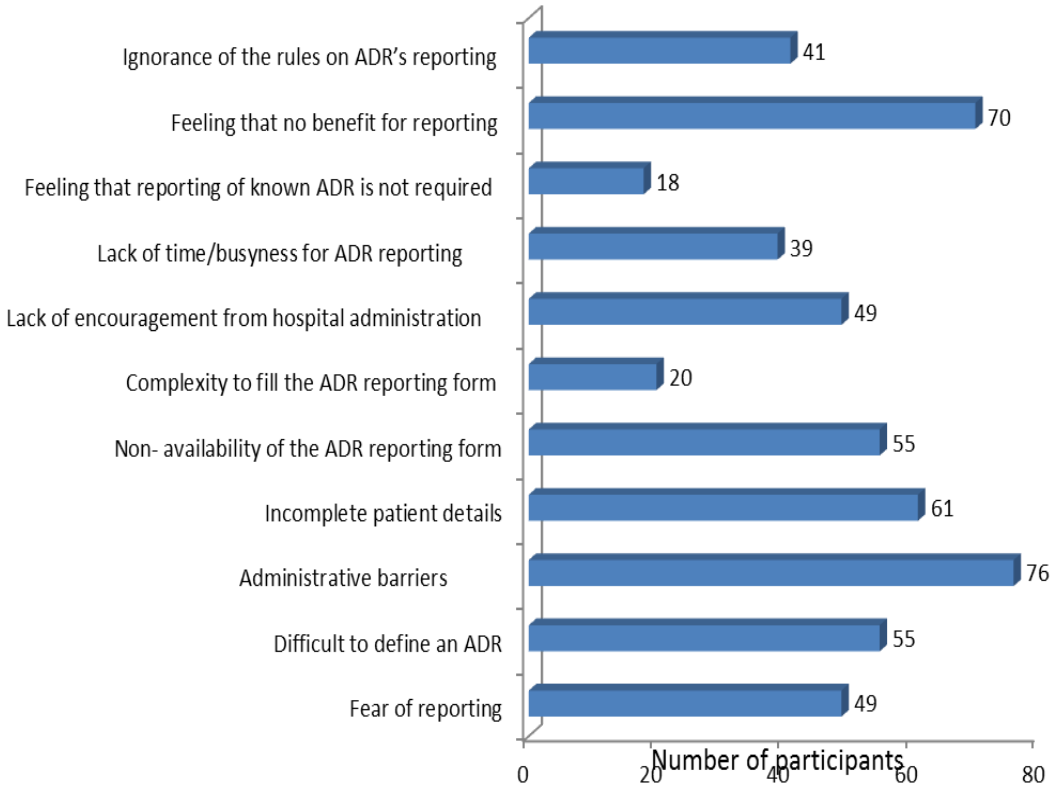

Fig. 5: Factors discouraging pharmacists to report a suspected ADR.

Responsibility for reporting ADRs

Regarding the responsibility for reporting ADRs, about 65.89% of pharmacists said that all healthcare workers should report ADRs, and more than a third (34.11%) said that pharmacists are in charge of reporting. Educating healthcare professionals (67.44 %), establishing national awareness programmes on ADRs reporting (29.46%), and producing a monthly bulletin on ADRs were among the suggestions made by pharmacists to improve ADRs reporting (24.42%).

Establishing ADR monitoring center

Regarding opinion about establishing ADR monitoring center, according to the majority of pharmacists (82.17%), it should be in every hospital. One should be in each city, according to 16.67% of respondents. While 1.16% believe it is not required in all hospitals. The majority of pharmacists (84.50%) had no idea where the international centre for ADRs monitoring was located.

Discussion

In the current study, more than half of the participants (68.6%) were young people between the ages of 20 and 30 year. The bulk of the participants (87.86%) were females, and over half of the pharmacists (53.57%) had less than five years of experience. Almost majority of the pharmacists had a bachelor's degree, with only 1.43% having a master's degree. The majority of the participants work in public hospitals (48.57%), while others work in private hospitals (27.86%).These results agreed with Alraie et al., [15] found the majority of the pharmacists in the survey were female and between the ages of 25 and 29 (86.1%). Furthermore, 84.3% attended a state Egyptian university, compared to 15.7% who attended a private Egyptian university. 70.5% earned a bachelor's degree as their highest educational achievement. Furthermore, 33.9% worked in MOH hospitals and had at least seven years of experience. In addition, Mahmoud *et al.,* [16] revealed that the average age of the participants was 29.9 years. 79.4% were Egyptian graduates who had completed their bachelorette degree (98.1%). The bulk of the participants (66.7%) worked in chain community pharmacies.

The present study showed that, 97.14% agreed that not all medications on the market are safe, and 87.14% reported seeing a suspected ADR. 32.86% were aware of the legislation governing ADRs reporting, and 49.29% were aware that their institution had an ADRs reporting mechanism. 43.57% knew what information was needed to report ADRs. The presence of a national pharmacovigilance centre in Egypt was known by 60.71% of pharmacists. Compared with our results, Kassa and Biru, [17] found 87.7% reported knew that all medications on the market are unsafe. In addition, 20.2% of respondents were familiar with the word pharmacovigilance and recognized what it meant. Similarly, 21.1% and 22.8% respondents were aware of the national reporting system and the ADR reporting form, respectively. Which are comparable with the finding of Angamo et al.,[18] who studied in the Jimma zone (19.5%). Also, Alraie et al., [15] showed low reporting rates of ADRs. This variation can be explained by Hedeiro et al.,[19] that, pharmacists' knowledge of PV practices greatly influences their reporting of ADRs.

In the current study, 29.29% had previously attended an ADRs workshop or awareness programme, while 73.57% had only heard of pharmacovigilance. Only half of the pharmacists who took part in the study knew what pharmacovigilance meant. Adisa and Omitogun[20] found 72.5% of health workers heard about pharmacovigilance, with 36.2% informed about it through other healthcare professionals. While they had a smaller number of people who understood the full concepts of pharmacovigilance. These confirmed by Gavaza *et al.*,[21]; Granas et al.,[22], which found instructional programmes that clarify pharmacists' roles and enhance their understanding of ADR reporting may have an impact on their reporting rates and actions. Only small percentage of pharmacists returned yellow cards to EPVC in the six months after the workshop, indicating that training measures alone may not be adequate to foster a "reporting culture" among hospital pharmacists. The understanding of ADRs to be reported was favorably influenced by the awareness session attended, according to Figueiras *et al.*,[23], who found out that the expected change in physician's reporting after an intervention program increased five folds, with cluster correlation coefficient of 0.005.

In the present study, pharmacists mentioned that most significant purposes of pharmacovigilance were to find previously unrecognised ADRs (40.71%), to determine medication safety (26.43%), to determine ADR incidence (19.29%), and to determine predisposing variables to ADRs (13.57%). This is in line with the most prevalent goals of an ADR spontaneous reporting system, according to Vessal *et al.*,[24] were to uncover previously unknown ADRS (61%), measure the incidence of ADR (60%), and compare ADRS of the same pharmaceutical from different drug businesses (38%). Furthermore, to compare ADRS for drugs in similar therapeutic classes (37%), as well as to discover variables that may predispose to ADR (32%). In the other side, Zawiah et al.[25] found 98.1% of pharmacists

stated that the major objective of ADRs reporting is to enable the safe drug to be identified.

Regarding attitudes of pharmacists towards ADRs reporting by the participated pharmacists, only 12.14 percent of them said they encountered an ADR. 22.14% of pharmacists thought that their institution's ADR reporting system encourages them to report more. 47.14% said there was a record of ADRs reported and that they were receiving proper feedback on their ADRs. 90% of respondents said they advise patients about adverse drug reactions, and 100% believed an ADR reporting system would benefit patients or improve the patients' care process. ADR reporting is a responsibility for pharmacists, according to 79.29%, and pharmacovigilance should be taught in details to medical undergraduate students, according to 94.29%. Nearly results were reported by Kassa and Biru, [17] reported 87.7% agreed that ADR reporting should be part of their job, 76.3% agreed that ADR reporting should be mandatory, and 73.7% felt that one ADR report makes a difference. Furthermore, 108.7% and 88.6% felt that reporting ADR is important for the public and enhances patient care quality, respectively. ADRs should be reported spontaneously on a frequent basis, according to 77.2% health professionals, with 76.3% underlining that there should be assurance for ADRs connected to the drug before reporting.

Besides, 58.77% of respondents were aware that all HCPs are responsible and an obligation to report ADRs to the concerned body. While, our findings were lower than that reported by Wilbur et al.,[26] as one-third of respondents had submitted a suspected ADR report in Qatar and 21% in Turkey. But our rate was higher than reported in community pharmacist populations documented recently in the region, approximately 10% in Saudi Arabia. Greater familiarity with pharmacovigilance; regular interaction with patients having serious ADRs; and tight communications

with physicians who may delegate reporting of ADRs have all been cited as factors for such inpatient site-related variations in reporting.

This study reported that, 63.57% encountered ADR rarely, 30.71% encountered an ADR occasionally and 5.71% encountered an ADR commonly. Only 34 (29.82%) of respondents had at least one patient with ADR in the previous 12 months of clinical practice, according to Kassa and Biru [17], with 70.59% and 50% recording and reporting ADRs, respectively. Furthermore, Suyagh *et al.*,[27] revealed that 91.2% of pharmacists had seen at least one adverse drug reaction in a patient per year, but only 19.5% had ever reported one.

This study found less than half of the participated pharmacists (41.43%) did not know to whome reporting should be addressed and about 27.14% of the pharmacists indicated that ADRs should be reported to national ADR monitoring center. While, in the study of Mahmoud et al.,[16] most pharmacists claimed that they had submitted ADRs to the Ministry of Health and SFDA. Also, in the study by Bawazir,[28], the majority of pharmacists surveyed claimed that they had submitted ADRs to both the pharmaceutical company and the Ministry of Health. These varied results may be related to little awareness to reporting. Additionally, Kassa and Biru,[17] reported 37 (32.5%) and 32 (28.1%) of the respondents responded that ADRs should be reported to EFDA and Drug and therapeutic Committee (DTC) of the respective health facility, respectively.

The present study demonstrated that, approximately 65% of the participants get information about ADRs from the internet followed by textbooks (34.29%) and colleagues (20.71%). Other findings were reported by Kassa and Biru,[17] discovered that more than half of the respondents (64 (56.1%)) used the National Drug Formulary and Standard Treatment Guideline (STG) as their primary sources of information about ADR, followed by standard text books (53 (46.5%).

In the current study, all types of ADRs should be disclosed, according to 71.43% of respondents. While (16%, 11%, 10%, 5%, and 1%, respectively) showed that any adverse events, novel drug reactions, unexpected reactions, seriousness of events, and only proven ADR reactions to the drug should be reported. Only major and life-threatening ADRs should be reported, according to a large percentage of respondents (81.58%), while 21.05% were aware that mild to moderate unexpected, certain, and suspected reactions must be recorded, according to Kassa and Biru [17] . In addition, in the study by Cheema et al., [29], To both children and adults, all pharmacists emphasized that they would report both large and minor ADRs from drugs marked with a

black triangle. In addition, POM would produce substantial reactions in more than 90% of patients. Furthermore, Fadare et al.,[30] discovered that the vast majority of respondents (>70%) were aware that suspected, significant, and specific reactions should be recorded. The disparity across studies could be explained by community pharmacists' propensity to report an adverse event, which is more likely to influence the ADR reporting method.

The presence of an awareness atmosphere at their institution (61.43%), followed by the simplicity of the reporting system's operation, were among the elements that pharmacists in this study can motivate them to report a suspected ADR (40%). As with the finding of the Zawiah et al.,study[25] , who asked pharmacists what motivates them to report ADRs . The vast majority of respondents stated that they were only encouraged to submit ADRs when the reaction was classed as serious (95.6%). Suyagh et al.[27] also discovered that the nature and severity of ADRs are two factors that caused pharmacists to report them. Pharmacists preferred to keep track of serious reactions, as well as rare and previously undocumented reactions.

In our study, factors discouraging pharmacists to report suspected ADRs were, feeling that no benefit for reporting (29.28%), presence of administrative barriers (26.43%), non-availability of the ADR reporting form (23.57%) and lack of encouragement from hospital administration (23.57%). In this vein, Alraie *et al.*,[15] reported that the most common reasons given by respondents for not reporting ADRs in Egypt were that the reporting method was unknown, clinicians were uninformed of the process, resulting in a communication problem, difficulty filling out patient information, and inability to link AE to medication prescribed. In the follow-up phone call, the most common cited deterrents to reporting ADRs were a lack of time, administrative barriers, and the inability to complete patient details. Our results were lower than those reported by Kassa and Biru, [17], lack of feedback (58.8%), reporting forms not available when needed (46.4%), not known where to report (46.4%), and not known how to fill out and report the report form (41.2%) were among the reasons given by respondents for not reporting ADRs. In addition, Adisa and Omitogun[20] found that unavailability of the reporting form (37.4%), insufficient clinical knowledge (32.7%), lack of experience in filling out the ADR reporting form (9.4%), non-threatening nature of ADRs (9.4%), complicated nature of ADR reporting (6.5%), fear of liability (3.7%), and lack of time to report ADRs were all barriers to health workers reporting ADRs (0.9%).

In addition, Vessal et al.,[24] found the most common reasons for not reporting were "uncertain association," "too insignificant to mention," "too well known to report," and "yellow card not available." These differences may be due to the fact that our study had a smaller sample size than others. Toklu et al. [31] agreed, stating that Turkish pharmacists did not regard ADR reporting as a natural job for their profession, explaining that the prescriber bears primary responsibility. This helps participants understand that all members of the health-care team can contribute to medication safety and effectiveness.[32] Also, Alraie et al., [15] reported that doctors and nurses play an essential role in ADR reporting. According to Zawiah et al.,[25], 88.3% of pharmacists believe that pharmacists are responsible for reporting ADRs, followed by doctors (86.4%) and drug firms (62.1%). In contrary, Carandang et al.,[33] found 86% nurses and 72% of physicians had a good knowledge about ADR reporting and 61% of pharmacists had an adequate knowledge.

In this study, pharmacists suggested that education of the healthcare professionals (63.57%), issued a monthly bulletin on ADRs (37.14%) holding national awareness programs on ADRs reporting (29.29%) are ways to improve ADRs reporting. Cheema et al. [29] have underlined the importance of providing community pharmacists with explicit education and training in order to improve their understanding and awareness of ADRs. Smith and Webley's [34] previous study on the extent of pharmacovigilance education delivered to pharmacy students found a higher level of interest in the issue.

Limitations of the study

Some pharmacists stated that their pharmacy did not have internet access, which could have led to the underreporting of ADRs. In addition, the severe workload of community pharmacists may have hampered response rates. In addition, several hospital pharmacists also have a part-time job in a community pharmacy. Nonetheless, our findings revealed information regarding Egyptians' understanding and

perceptions of PV activities, which can be used as a starting point for future research.

Conclusions

The majority of pharmacists were educated on pharmacovigilance and viewed ADR reporting favorably. The notion that there is no benefit to reporting suspected ADRs, the presence of administrative impediments, the lack of availability of the ADR reporting form, and the lack of encouragement from hospital administration are all factors that deter pharmacists from reporting suspected ADRs. To increase pharmacists' comprehension and awareness of the ADR reporting procedure, pharmacovigilance authorities should take the necessary efforts to implement interventional programmes as soon as practicable. Education and training in ADR reporting are one of the planning approaches for increasing the reporting rate.

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Conflicts of Interest

The authors declare no conflict of interest.

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معرفة الصيادلة ومواقفهم حول تقارير التفاعلات الدوائية الضارة وممارسة اليقظة الدوائية في المستشفيات المصرية

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اليقظة الدوائية هي ممارسة اكتشاف وتقليل المخاطر المرتبطة بالمنتجات الصيدلانية ، بالإضافة إلى تحسين سلامة المرضى من خلال تقييم نسبة المخاطر إلى الفوائد للأدوية. بحثت لدراسة الحالية في معرفة الصيادلة ومواقفهم وممارساتهم فيما يتعلق بتقارير التفاعلات الدوائية الضارة ، بالإضافة إلى العوامل التي قد تؤثر على الإبلاغ. تم إجراء مسح مقطعي قائم على الاستبيان لجمع البيانات بين ٢٥٨ صيدليًا من مايو ٢٠٢٠ إلى سبتمبر ٢٠٢١. تم توزيع استبيان مصمم مسبقًا لتقييم المعرفة والمواقف والممارسات وتم جمع الاستبيان المملوء وتحليله. كان أكثر من ثلث الصيادلة غير متأكدين لمن سيبلغون عن التفاعلات الدوائية الضارة ، وقال ٢٦,٣٦٪ منهم إنه يجب الإبلاغ عن التفاعلات الدوائية الضارة إلى المركز الوطني لرصد .ADR قال ثلث الصيادلة (٣١,٧٨٪) أن الصيادلة مسؤولون عن الإبلاغ عن التفاعلات الدوائية الضارة ، بينما قال ٦٥,٨٩٪ إن على جميع مقدمي الرعاية الصحية الإبلاغ عن التفاعلات الدوائية الضائرة.

كان لدى معظم الصيادلة معرفة كافية باليقظة الدوائية وحافظوا على موقف إيجابي تجاه الإبلاغ عن التفاعلات الدوائية الضارة. يمكن استخدام التعليم والتدريب في الإبلاغ عن التفاعلات الدوائية الضارة كأحد استراتيجيات التخطيط لتحسين معدل الإبلاغ.