IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)
e-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 21, Issue 2 Ser.6 (February. 2022), PP 01-06
www.iosrjournals.org

Assessment of Knowledge, Attitude and Practice among the Health Care Professionals towards Adverse Drug Reactions Reporting

K. Leela prasad Babu[1], D.V.N.Padmini[2], G.HarshaLatha[2], M.Vishnu priyanka[2], O.Jahnavi[2], Meda Venkatasubbaiah[3]*,

[1] *Assistant. Professor, Department of General Medicine, Government General Hospital (GGH-RIMS), Kadapa 516003, Andhra Pradesh, India*

[2] *Pharm-D Intern, Department of pharmacy practice, P. Rami Reddy Memorial College of Pharmacy, Kadapa 516003, Andhra Pradesh, India*

[3] [*] *Ph. D., Associate Professor, Department of Pharmacy Practice, P. Rami Reddy Memorial College of Pharmacy, Kadapa 516003, Andhra Pradesh, India*

Abstract:

Background: *Healthcare professionals (HCPs) should have an updated knowledge on the drug safety concerns and their management to minimize the risks of ADRs. This survey was conducted to assess the knowledge, attitude and practice (KAP) of HCPs towards ADRs and Pharmacovigilance and to identify the reasons of under reporting.*

Materials and Methods: *A Cross-sectional questionnaire-based study was conducted for a period of 6 months at various hospitals in and around Kadapa using a self-designed questionnaire with 25 questions [knowledge (9), attitude (9), practice (7)].*

Results: *A total of 87 participants were included in the study, 27 (31%) were males and 60 (69%) were females. Among all the participants, 21 were Doctors, 13 were Clinical pharmacists, 31 were Interns, 17 were Nurses, and 5 were Hospital pharmacists. In this study, majority (87%) of the participants has defined the ADR correctly and same percentages of HCPs were known the National Pharmacovigilance system. A significantly high number of participants(85%) were known that all reactions need to be reported. The discouraging factors of ADR reporting found among the study HCPs were legal issues (7%), no encouragement (12.64%), and 48.27% have claimed multiple factors.*

Conclusion: *With this study we conclude that, the HCPs of the study site have a good KAP towards ADR reporting. But still there is a need to improve the KAP of Nurses as they have very poor practicing habits when compared to other HCPs and Doctors were found to be involved majorly in ADR reporting.*

Key Words: Pharmacovigilance, Adverse drug reactions, Knowledge, Attitude, Practice,Health care professionals.

Date of Submission: 01-02-2022 Date of Acceptance: 13-02-2022

I. Introduction

Adverse drug reactions (ADRs) encountered commonly in daily practice1 and are identified as one of the major contributing factors for morbidity and mortality.ADR also causes an economic burden on the health-care systemby reduction in the quality of life, increase hospitalization, lengthen hospital stay and increase mortality. Hence, their early detection and prevention is necessary.[1]

The global epidemiological data show that 3–6% of hospital admissions are due to ADRs and the percentage of patients experiencing ADRs during hospitalization ranges from 1.5% to 35%.

Pharmacovigilance has constantly grown its importance in last 15 years, relating to the absolute amount of adverse drug reactions (ADRs) and to the fact of several hospital admissions are due to ADRs. [2] The success of a pharmacovigilance program depends upon the involvement of the healthcare professionals and reporting the ADRs. The main reasons for the failure of pharmacovigilance programs are due to the underreporting of ADRs. [3] It is estimated that only 6–10% of all ADRs are reported.

Being the key HCP (healthcare professionals), the doctors, nurses and pharmacists have immense responsibility in reporting ADRs and strengthening the pharmacovigilance mechanisms that exists in their vicinity.

According to the studies from various settings, the inadequate knowledge and attitude of healthcare professionals about Pharmacovigilance are associated with a high degree of underreporting.[4] An educational

interventional session can increase the knowledge about pharmacovigilance and better the attitude and practice of it among the healthcare professionals. Before establishing any intervention, it is necessary to evaluate their knowledge, attitude and practices regarding ADRs reporting. Therefore, the objective of this study is to determine the current status of Knowledge, Attitudes and Practice (KAP) towards ADRs reporting among healthcare professionals (HCPs).[5]

II. Material And Methods

The Study was commenced in various hospitals in and around Kadapa after getting approval from the Institutional Ethical Committee. A cross-sectional descriptive questionnaire-based survey was conducted on the HCPs and all interns of medical, nursing and pharmaceutical fields or academics for 6 months.

Eligibility criteria:

Inclusion Criteria:

All healthcare professionals including medical, nursing and pharmaceutical fields and academics.

Exclusion Criteria:

- Non interns
- Lab technicians as not directly involved in patient care
- Dispensing pharmacists
- Radiologists
- Incomplete questionnaires
- The healthcare professionals who were not willing to participate.

Study materials:

- KAP questionnaire (Annexure I)
- Likert scale, (Annexure II)
- Bloomsscale (Annexure III)
- Informedconsent form (Annexure IV)
- Educational materials like pamphlets, posters, notification form, Drug Alerts (IPC/CDSCO) (Annexure V)
- IPC Suspected ADR Reporting Form (Annexure VI)

A self-designed and pre-validated questionnaire was circulated to the HCPs after getting their consent by explaining the purpose of the study. Then the filled questionnaires were screened for their completeness and the data was entered into the spreadsheets (Micro-Soft Excel) for the analysis. This questionnaire consists of 2 parts, first part includes participant's demographics, and the later part includes 3 subdivisions i.e. knowledge, attitude, and practice-related questions and options. A total of 25 multiple options and close-ended questions related to the Knowledge (9), Attitude (9), and Practice (7) of ADR reporting and the PV were included.

Knowledge was assessed by using the scoring system where each correct answer carries 2 marks and 0 marks for the wrong answer. The attitude related questions were scored based upon the participant's degree of agreement using Likert scale. The score is as following; "0"– strongly disagree, "1"- disagree, "2"- Neutral, "3"- agree and "4"-strongly agree. Practice refers to the ways in which they demonstrate their knowledge and attitude through their actions.

Educational strategies:

Educational strategies towards improving the KAP of the HCPs will be implemented through pamphlets, posters, notification form, Drug Alerts(IPC/CDSCO), different modes of reminders (regular visits to the HCPs and circulating ADR notification forms (Annexure-V)

Statistical analysis:

All data summaries and listings were generated using MS Excel, under the Micro-Soft XP operating system 2013.Descriptive statistics like percentage, mean, SD were used to analyse the data.

II. Results

All the study participants were categorized based on their qualification into nine groups. Among all, 25 (28.7%) were Pharm.D graduates and 22 (25.3%) were MBBS graduates.

Table no 1: Qualification of the participants

S. No	Qualification	Frequency	%
1.	MD	8	9.2%
2.	MBBS	22	25.3%
3.	Pharm.D	25	28.7%
4.	M.Pharmacy	3	3.4%

5.	B.Pharmacy	10	11.5%
6.	M.SC Nursing	1	1.1%
7.	B.SC Nursing	15	17.2%
8.	Dental	2	2.3%
9.	BPT	1	1.1%

Discouraging factors for reporting ADRs among participants

An analysis of the factors discouraging HCPs from reporting ADRs showed that the 48.27%of HCPs have expressed multiple discouraging factors for reporting ADRs.

Table no 2: Factors discouraging the HCPs from the reporting of ADRs.

S. No.	Factor	Number of respondents	Percentage of respondents
1	Lack of time	05	5.74%
2	Legal issues	06	7%
3	No encouragement and no remuneration	11	12.64%
4	Not aware	15	17.24%
5	One ADR may not affect	03	3.44%
6	Problem of confidentiality	03	3.44%
7	Treatment is important	02	2.3%
8	All the above	42	48.27%

Knowledge

We have assessed the participants' knowledge about the ADR reporting and PV using Bloom's cut-off scale and found that 26 % had Good knowledge and the detailed information was presented in Table 3.

Table no 3: Knowledge of the HCPs on the reporting of ADRs

Bloom's cut-off percentage	No. of participants	Percentage
Good knowledge (80-100%)	23	26.43
Moderate knowledge (60-79%)	35	40.22
Poor knowledge (<60%)	29	33.33

We have compared the knowledge among HCPs and found that 57% of Doctors had Moderate knowledge, 60% of Hospital pharmacists had Moderate knowledge, 53% of Clinical pharmacists had Good knowledge, 47% of Nurses had Moderate, and 41% of Interns had Poor knowledge.

Table no 4: Responses to Knowledge related questions**.**

QUESTIONS	FREQUENCY OF CORRECT ANSWERS	
	n=87	%
1. The important purpose of pharmacovigilance is	17	19.54
2. Which of the following method is commonly employed by the pharmaceutical companies to monitor adverse drug reactions of new drugs in the market?	69	79.31
3. In India, which regulatory body is responsible for monitoring of ADRs?	76	87.35
4. Which of the following defines an ADR correctly?	76	87.35
5. Which ADRs should be reported?	74	85.05
6. Is Adverse Drug Event and ADR same?	58	66.66
7. Which one of the following is the "WHO online database" for ADRs?	44	50.57
8. Choose the correct order (or) sequence from the following.	55	63.21
9. What possible factors pre-dispose a patient to develop ADRs?	66	75.86

Attitude

More than fifty percent of participants have strongly agreed that the implementation of ADR reporting system and active discussion on the observed ADR during their practice will be useful for the improvement of the knowledge. Around 50% of the study HCPs has agreed that the establishment of the ADR monitoring centre in every hospital, regular training programs on Pharmacovigilance and close monitoring of the new drug therapy would be beneficial for both the HCPs and patients. And 62 % had felt that the reporting is compulsory. Table 5 explains the detailed attitude of the HCPs at the study center.

We have assessed the attitudes of HCPs towards ADR reporting. This section included 7 questions, responses to which were measured on a five-point Likert scale. A mean score ≥2 was considered to reflect a positive attitude, while a score <2 was considered to indicate a negative attitude. Number of participants with positive and negative attitudes was presented in Table 6.

Table no 5: Responses to Attitude related questions.

QUESTIONS	FREQUENCY OF RESPONSES (%)				
	Strongly disagree	**Disagree**	**Agree**	**Strongly agree**	**Neutral**
1. Implementation of ADR reporting or making the habit of ADR reporting in your practice is useful or appreciable	7 (8.04)	2 (2.29)	26 (29.88)	45 (51.72)	7 (8.04)
2. Professional discussion on suspected ADR helps health care professionals in developing their knowledge of treatment outcomes and may improve the patient care.	4 (4.59)	1 (1.14)	34 (39.08)	45 (51.72)	3 (3.44)
3. Treatment of ADRs may pose the financial burden on the patients and the health system	5 (5.74)	25 (28.73)	24 (27.58)	23 (26.43)	10 (11.49)
4. Establishment of an ADR monitoring center in every hospital will improve the patient care and also reduces safety issues.	2 (2.29)	2 (2.29)	35 (40.22)	42 (48.27)	6 (6.89)
5. Do you agree that ADR reporting system would benefits both patients and doctors	2 (2.29)	1 (1.14)	36 (41.37)	41 (47.12)	7 (8.04)
6. Habit of monitoring new drugs & their outcomes can improve the patient care	1 (1.14)	5 (5.74)	36 (41.37)	42 (48.27)	3 (3.44)
7. Proper training should be provided to the health care professional to improve the habit of ADR reporting.	1 (1.14)	1 (1.14)	38 (43.67)	44 (50.57)	3 (3.44)

QUESTION	**VOLUNTARY**	**COMPULSARY**	**REMUNERATED**
8.ADR reporting should be	23 (26.43)	54 (62.02)	10 (11.49)

Table no 6: Assessing Attitude based on Likert Scale.

QUESTIONS	No. of participants with positive attitude	No. of participants with negative attitude
1. Implementation of ADR reporting or making the habit of ADR reporting in your practice is useful or appreciable	78	9
2. Professional discussion on suspected ADR helps health care professionals in developing their knowledge of treatment outcomes and may improve the patient care.	82	5
3. Treatment of ADRs may pose the financial burden on the patients and the health system	57	30
4. Establishment of an ADR monitoring center in every hospital will improve the patient care and also reduces safety issues.	83	4
5. Do you agree that ADR reporting system would benefits both patients and doctors	84	3
6. Habit of monitoring new drugs & their outcomes can improve the patient care	81	6
7. Proper training should be provided to the health care professional to improve the habit of ADR reporting.	85	2

Practice

We found that 57% of the study HCPs were identified the ADRs during their practicing and 32 % were reported at least one ADR. More than 80% of HCPs at the study site are collecting the patients' drug allergic history before the prescription. And the detailed information on the study participants' practice is presented in Table 7.

Table no7: Assessment of the practice

QUESTIONS	FREQUENCY OF RESPONSES (%)	
	YES	**NO**
1. Have you ever identified the adverse drug reaction/s in your patient during your professional practice?	50 (57.47)	37 (42.52)
2. Have you ever been attended on how to report Adverse Drug Reaction (ADR)?	46 (52.87)	41 (47.12)
3. Have you ever reported the adverse drug reaction/s (ADR) to the Pharmacovigilance center?	30 (34.48)	57 (65.51)
4. Are you collecting drug allergic history in your practice before the prescription?	71 (81.60)	16 (18.39)

5. Are you spending time in knowing the regulatory actions on the marketed drug?		50 (57.47)	37 (42.52)
6. Have you ever visited the ADR monitoring center in your hospital?	**Don't know whether it is established or not**	24 (27.58)	43 (49.42)
	20 (22.98)		

IV. DISCUSSION

The present study is a questionnaire-based study to assess the knowledge, attitude and practice of Pharmacovigilance among health care professionals in a tertiary care teaching hospital. Majority of the study participants were females (69%) and Interns (36%) of Pharm D, Medical PGs and MBBS.

Majority (36%) of the study participants are having 1-5 years of experience in the healthcare practice. The majority of the study participants had the considerable level of knowledge regarding the Pharmacovigilance i.e. 67% of study participants have answered correctly for more than 65% of the knowledge related questions, which is a good sign that at the study site can handle the drug safety issues. In the present study, the knowledge of HCPs on ADR reporting was low with only 29% of the HCPs having adequate knowledge.

In this study, majority (87%) of the participants have defined the ADR correctly and same percentage of HCPs were known the National Pharmacovigilance system. A significantly high number of participants (85%) were known that all reactions need to be reported irrespective of their seriousness, severity, frequency, and novelty.

When compared to all HCPs Clinical pharmacists have Good knowledge i.e, 53.84%, Hospital pharmacists have Moderate knowledge i.e, 60% and Nurses have poor knowledge i.e, 47%.

Overall, more than half of the health workers demonstrate positive attitude towards ADR reporting. Even though, healthcare providers play a significant role in ensuring a robust Pharmacovigilance system, the rate of spontaneous reporting of ADRs by healthcare professionals in many countries is extremely low (6–10%). By using Likert scale we have assessed Attitude of study participants. 97.70 % of health care professionals showed positive attitude towards proper training should be provided to the HCPs to improve the habit of ADR reporting.96.55% HCPs thought ADR reporting benefits both patients and doctors. Only 65.51% thought treatment of ADRs may pose financial burden on the patients. 62.02% of the respondents felt that ADR reporting is compulsory.

Suggestions for improving ADR reporting

1. Each hospital should establish a local "Pharmacovigilance Unit" for reporting ADRs and collecting related data.
2. Pharmacovigilance workshops should be conducted to provide guidance to physicians, pharmacists and nurses for recognizing and reporting ADRs.
3. ADR reporting by patients should also be encouraged along with reporting by healthcare professionals.
4. Representatives from NPP should co-ordinate with healthcare professionals at their work place.
5. A separate column should be provided for ADR reporting in patient medication chart.
6. Incentives should be provided to pharmacists reporting ADRs not associated with human errors.
7. Periodic meetings of experts from NPP with pharmacists should be arranged to boost reporting.

V. Conclusion

With this study we conclude that on overall, the HCPs of the study site have a good KAP towards ADR reporting. But still there is a need to improve the KAP of Nurses as they have very poor practicing habits when compared to other HCPs and Doctors were found to be involved majorly in ADR reporting. We also conclude that there is need to remove the negative perceptions and discouraging factors of ADR reporting among HCPs. With this study we found there is a need for conducting an awareness program for Nurses and Interns to improve their KAP, which in turn improves the patient care.

References

[1]. Chetna K. Desai, et. al, An evaluation of knowledge, attitude, and practice of adverse drug reaction reporting among prescribers at a tertiary care hospital. Perspectives in Clinical Research; 2011, Vol. 2, Issue 4.129–136.

[2]. Harish G. Bagewadi, et. al, Knowledge, attitude, perceptions and assessment of effectiveness of educational intervention on Pharmacovigilance among undergraduate medical students at Gulbarga Institute of Medical Sciences, Kalburgi, India; International Journal of Basic & Clinical Pharmacology; 2018, Vol 7, Issue 1,103-108.

[3]. Subish Palaian, et. al, Health professionals' knowledge, attitude and practices towards pharmacovigilance in Nepal. Pharmacy Practice (Granada). 2011, Vol 9; Issue 4, 228–235.

[4]. Dharini B, et. al, Knowledge, attitude, and practice toward pharmacovigilance and adverse drug reaction reporting among nursing staff and students: Asian journal of pharmaceutical and clinical research ;2017; Vol 11; Issue 3, 62-67.

[5]. Hager Ali Saleh, et. al, knowledge, attitude and practice of health professionals towards adverse drug reactions reporting; European Journal of Pharmaceutical and Medical Research; 2016, Vol 3, Issue 8, 12-21.

[6]. F.M. Alsaleh, et. al, Adverse drug reaction reporting among physicians working in private and government hospitals in Kuwait, Saudi Pharmaceutical Journal 25 :2017,1184–1193

[7]. Hepler and Strand. Opportunities and responsibilities in pharmaceutical care. American Journal of Hospital Pharmacy. 1990;

Volume 47, Issue 3,Pages 533–543.
[8]. Darcy PF et. al, Adverse Drug Reaction Reporting: Pharmacists should have a bigger role in the UK. International Journal of Pharmacy Practice. 1991; 1: 3-4.
[9]. Veatch GBA et. al, The pharmacist and adverse drug reaction reporting. Pharmaceutical Journal 1985; 234: 107-109.
[10]. Hardman C, et. al, Adverse Drug Reaction Monitoring by Ward Pharmacists. Journal of Clinical and Hospital Pharmacy. 1982; 7: 71-73.
[11]. Wolfson DJ et. al, The community pharmacist and adverse drug reaction monitoring: An examination of the potential role in the United Kingdom. Pharmaceutical Journal. 1993; 251: 21-24.
[12]. Randall C. Training Pharmacists in Reporting ADRs. The Hospital Pharmacist. 1999; 6: 46-49.
[13]. A textbook of clinical pharmacy practice Second edition – G. Parthasarathy – university press - Pg.No.119
[14]. Amale PN, et. al, Pharmacovigilance Process in India: An overview. J Pharmacovigilant: 2018 , Vol 6, Issue 259.
[15]. ASHP guidelines on adverse drug reaction monitoring and reporting. Am J Health-Syst Pharm. 1995; 52:417–9.
[16]. Saleh et. al, Patient-centred pharmacovigilance: A review, Tropical Journal of Pharmaceutical Research January 2018; Vol 17, Issue 1: 179-188.
[17]. Sanjay Gedam, et. al, An educational intervention to assess knowledge, attitude, and practice of pharmacovigilance and adverse drug reactions among undergraduates in an Indian tertiary care teaching hospital, Vol. 11, Issue 8.
[18]. Siddiqui S et. al, Impact of educational intervention on health-care professional's behaviours toward adverse drug reactions reporting- A study of tribal belt of central India; National Journal of physiology, pharmacy and pharmacology; Vol 9, Issue 10, 760-767.
[19]. Sunil Shrestha et. al, Impact of an educational intervention on knowledge and attitude regarding pharmacovigilance among health professionals working on cancer hospital attached to a regional pharmacovigilance centre, BMC Medical education,
[20]. Saleem Sharoo. M, et. al, Assessment of impact of educational intervention on Knowledge, attitude and Practice of pharmacovigilance among interns; International Journal of Advanced community medicine; 2019, Issue 2, Vol 3, 203-205.
[21]. Mohd Faheem, et. al, An Educational Intervention to Assess Knowledge, Attitude and Practice of Pharmacovigilance among Nurses/Midwives at IIMSR Tertiary Care Teaching Hospital. EAS Journal of Pharmacy and Pharmacology, 2019, Vol.1, Issue 6.
[22]. Abimbola et. al, Educational intervention to improve the knowledge, attitude and practice of healthcare professionals regarding pharmacovigilance in South-South Nigeria, Therapeutic Advances in Drug Safety, 2019, Vol. 10: 1–12.
[23]. Srikanth MS et. al, Assessment of structured educational intervention and Barriers of community pharmacists towards adverse drug reaction reporting and monitoring in south Indian district; Drug intervention today; 2019; Special issue, Vol 12, 131-148.
[24]. Rana Abu et. al, Effect of educational intervention on healthcare providers knowledge and perception towards pharmacovigilance: a tertiary teaching hospital experience. Saudi Pharmaceutical Journal; 2018; Vol 26,611–616.
[25]. Jagjit Singh et. al, Lack of Awareness of Pharmacovigilance among Young Healthcare Professionals in India: An Issue Requiring Urgent Intervention. International Journal of Applied and Basic Medical Research;2018; Vol 8; Issue 3
[26]. AlShammari, et. al, Knowledge, attitudes & practices of healthcare professionals in hospitals towards the reporting of adverse drug reactions in Saudi Arabia: A multi-centre cross-sectional study. Saudi Pharmaceutical Journal. 2018, Vol 26, Issue 5.
[27]. Nisha Jha et. al, Effect of an educational intervention on knowledge and attitude regarding pharmacovigilance and consumer pharmacovigilance among community pharmacists in Lalitpur district, Nepal. Bio Med Central; 2017; Vol 10; Issue 4.
[28]. Sunita, et al, Evaluation of Knowledge, Awareness and Attitude Practice among Health Care Professionals about Pharmacovigilance at Tertiary Care Hospital in Delhi. International Journal of Pharma Research and Health Sciences; 2017; Vol 5 issue 5: 1862-67.
[29]. Katekhaye VM, et. al, Knowledge, attitude and practice of pharmacovigilance among medical professionals at a tertiary care hospital in Mumbai, Maharashtra, India. International Journal of Research in Medical Sciences, 2017, Vol 5, Issue 1.
[30]. Prem Kumar G et. al, An evaluation of impact of educational intervention on pharmacovigilance and adr reporting among nurses in tertiary care teaching hospital. World Journal of Pharmaceutical Research; 2015; Vol 4, Issue 10, 2568-2575.
[31]. Kaur, et. al, Knowledge, attitude, and practice of healthcare professionals about adverse drug reaction in major tertiary care teaching hospital in Punjab; International Journal of Basic & Clinical Pharmacology; 2015, Vol 4, Issue 5, 993-998.
[32]. Hanafi, et. al, An educational intervention to improve nurses' knowledge, attitude, and practice toward reporting of adverse drug reactions, Iranian Journal of Nursing and Midwifery Research, 2014, Vol. 19, Issue 1.
[33]. Manisha et.al, Effect of Educational Intervention on Adverse Drug Reporting by Physicians: A Cross-Sectional Study, ISRN Pharmacology, 2014.
[34]. Bahekar et.al, Impact of educational intervention on knowledge, attitude and practice of pharmacovigilance among medical graduates of rural tertiary care, teaching hospital of central India, Mintage journal of Pharmaceutical & Medical Sciences, 2013, Vol 2; Issue 2, 51-54.
[35]. Radhakrishnan. R, et. al, An educational intervention to assess knowledge attitude practice of pharmacovigilance among health care professionals in an Indian tertiary care teaching hospital: International Journal of Pharm Tech Research; 2011; Vol. 3, Issue 2.678-692.
[36]. Korde RA et. al, A KAP study of pharmacovigilance among junior residents and interns of a tertiary care hospital, Int J Basic Clin Pharmac0l. 2018 Nov; Vol 7, Issue 11: 2178-2183
[37]. Adisa et. al, Awareness, knowledge, attitude and practice of adverse drug reaction reporting among health workers and patients in selected primary healthcare centres in Ibadan, southwestern Nigeria, BMC Health Services Research, 2019, 19: 926
[38]. Alsaleh FM et. al, Knowledge, attitude and practices of pharmacovigilance and adverse drug reaction reporting among pharmacists working in secondary and tertiary governmental hospitals in Kuwait, Saudi Pharmaceutical Journal, 2017, 25, 830–837.
[39]. Veena DR et. al, Knowledge, attitude and practice of adverse drug reaction reporting and pharmacovigilance among healthcare professionals in a tertiary care teaching hospital ,Int. J. of Res. in Pharmacology &Pharmacotherapeutics , 2018 , Vol-7(3), Pg.no. [233-238].

K. Leela prasad Babu, et. al. "Assessment of knowledge, attitude and practice among the health care professionals towards adverse drug reactions reporting." *IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)*, 21(02), 2022, pp. 01-06.