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Study on Knowledge, Attitude, and Perception (KAP) of Nursing Students on Adverse Drug Reaction Due to Prescribing Cascade Among Elderly Patients in Tumkur

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ABSTRACT

Background: Adverse drug reactions (ADRs) are misunderstood as new medical conditions, adding one more drug to the prescription. This process is called the prescribing cascade (PC).

Material and Methods: This is a prospective, cross-sectional, pre-validated questionnaire-based study conducted in Tumkur, Karnataka. Nursing students participated in this study.

Result: The study showed that many nursing students know the term ADR (38.9%). However, little is known about its risk factors, documentation, and reporting. We observed positive results and have a good perception of the prescribing cascade. The majority opined that PC should be added to their course curriculum.

Conclusion: Continuous nursing education (CNE) on ADR and PC helps nursing students better understand. In turn, this knowledge helps to achieve rational drug therapy by minimizing the incidence of ADR and PC.

Keywords: Adverse Drug reactions, Prescribing cascades, Elderly, KAP.

INTRODUCTION

Sometimes drug-related problems are encountered while we are using the drugs. Among these adverse drug reactions (ADRs), they are frequently associated.[1] These ADRs not only increase morbidity; they also increase mortality, increased in hospital stay, and overall treatment expenses.[2] Most of the time, more than physicians' nurses spend quality time caring for patients. So, many patients often express their sufferings to a nurse rather than a physician.[3,4]

Hence, knowing about ADRs helps to minimize the incidence. Even if an ADR occurs, nurses must have good knowledge about ADRs and their negative consequences. Rarely, these ADRs are misinterpreted as new medical conditions, and doctors use them to prescribe another drug to manage ADRs. Even so, they may recommend diagnostic tests or self-administered, over-the-counter medications. This misinterpretation is called prescribing cascades (PC), and it is a new term that is little known among healthcare students and even professionals.[5-8] By having sufficient information about this new term, they can actively minimize PC incidence and occurrences. Hence, this study was planned with the aim of measuring the KAP of nursing students on ADRs due to PCs among elderly patients in Tumkur.

MATERIALS AND METHODS

This is a prospective, cross-sectional, and questionnaire-based study conducted in Tumkur, Karnataka State. A pre-validated questionnaire with a Cronbach's alpha of 0.865 was interpreted as reliable and having internal consistency used to collect data.

Institutional ethical committee approval was obtained preceding to the commencement of the study. Approval to conduct the study was obtained from the two nursing colleges. Students were

explained the importance and aim of the study. An informed consent form (ICF) was given along with the questionnaire. Sufficient time was given to give their consent. The filled-out questionnaire was collected back, and the data was assessed in the Statistical Package for Social Sciences version 27 with a subject code to avoid identity and bias.

Required sample size for the study was calculated using Epi Info 7.2.2.0, with a population size of 900, a 50% expected frequency, and a 5% acceptable margin of error. At a 95% confidence interval, the final sample size was calculated as 269, which was rounded to 270.

RESULTS

The pre-validated questionnaire was given to the undergraduate nursing students. The demographic details mentioned in the Table 1.

Table 1: The demographic details of the respondents.

Gender	**Number (N=49)**	**Percentage**
Male	117	43.3
Female	153	56.7
Age in Years	**Number**	**Percentage**
19	37	10.3
20	114	31.7
21	69	19.2
22	29	8.1
23	12	3.3
24	5	1.4
25	2	0.6
26	1	0.3
28	1	0.3
Course and Year	**Number**	**Percentage**
B.Sc. Nursing – 2nd Year	130	48.1
B.Sc. Nursing –3rd Year	136	50.4
B.Sc. Nursing – 4th Year	4	1.5

Table 2: Response to Knowledge, attitude, and perception questionnaire with frequency and percentage.

Qn. No.	Question	Code Number and Options	Frequency	Percentage
1)	What do you mean by adverse drug reactions?	1) Pharmacological action of one drug is altered by another drug	87	32.2
		2) Wanted and intended effects of drugs	54	20.0
		3) An unwanted and unintended effects of drugs	105	38.9
		4) Reactions to low dose administration of drugs	24	8.9
2)	How do you classify adverse drug reactions?	1) Class 1 and 2	62	23.0
		2) Type A and B	48	17.8
		3) Wanted and unwanted	66	24.4
		4) Quantitative and qualitative	94	34.8
3)	Who is most likely to experience an adverse drug reaction?	1) Older adults with multiple diseases.	37	13.7
		2) Older adults who are receiving five or more medications.	33	12.2
		3) Older adults with previous history of adverse drug reaction.	26	9.6
		4) All the above	174	64.4
4)	It is possible to identify all adverse drug reactions before a medication is made available for use on the market.	1) Yes	97	35.9
		2) No	173	64.1
5)	Different approaches are required for the management of each kind of adverse drug reaction.	1) Yes	240	89
		2) No	30	11
6)	The patient needs to be admitted to the hospital as soon as a serious adverse drug reaction manifests.	1) Yes	237	87.8
		2) No	33	12.2
7)	Are there any drugs that have been banned because of a serious adverse drug reaction?	1) Yes	220	81.5
		2) No	50	18.5
8)	There is a chance that the adverse drug reaction will be misinterpreted as a new medical condition.	1) Yes	162	60.0
		2) No	108	40.0
9)	What is the term used for misinterpreting an adverse drug reaction as a new medical condition and prescribing a new drug?	1) Adverse drug events	54	20.0
		2) Side effects	137	50.7
		3) Drug duplication	37	13.7
		4) Prescribing cascade	42	15.6
10)	The term "prescribing cascade" was first used by	1) Naranjo	89	33.0
		2) Rochon and Gurwitz	55	20.4
		3) Karch-Lasagna	65	24.1
		4) Thornton	61	22.6
11)	The cascade of prescriptions is common among the elderly population.	1) Yes	173	64.1
		2) No	97	35.9
12)	Prescribing cascade is more common in patients on multiple medications.	1) Yes	178	65.9
		2) No	92	34.1
13)	Sometimes it is very difficult to distinguish between an adverse drug reaction and a medical condition especially in elderly population.	1) Yes	207	76.7
		2) No	63	23.
Domain: Attitude				
14)	Reporting adverse drug reactions is my professional responsibility.	1) Strongly disagree	11	4.1
		2) Disagree	9	3.3
		3) Neutral	10	3.7
		4) Agree	89	33.0
		5) Strongly agree	151	55.9
15)	Adverse drug reaction reporting should be made mandatory.	1) Strongly disagree	1	0.4
		2) Disagree	9	3.3

		3) Neutral	33	12.2
		4) Agree	106	39.3
		5) Strongly agree	121	44.8
16)	Each patient should be made aware of possible adverse drug reactions every time they receive medicine.	1) Strongly disagree	4	1.5
		2) Disagree	20	7.4
		3) Neutral	35	13.0
		4) Agree	101	37.4
		5) Strongly agree	110	40.7
17)	Frequent monitoring of medication-related adverse drug reactions is necessary to improve patient care.	1) Strongly disagree	11	4.1
		2) Disagree	13	4.8.
		3) Neutral	23	8.5
		4) Agree	123	45.6
		5) Strongly agree	101	37.4
18)	Adequate training on identifying and reporting adverse drug reactions will be helpful to avoid the prescribing cascade by healthcare student.	1) Strongly disagree	4	1.5
		2) Disagree	13	4.8
		3) Neutral	36	13.3
		4) Agree	122	45.2
		5) Strongly agree	95	35.2
19)	The concept of prescribing cascades should be taught in the course curriculum.	1) Strongly disagree	10	3.7
		2) Disagree	26	9.6
		3) Neutral	71	26.3
		4) Agree	106	39.3
		5) Strongly agree	57	21.1
20)	Avoiding prescribing cascades in patients is my professional responsibility.	1) Strongly disagree	41	15.2
		2) Disagree	41	15.2
		3) Neutral	58	21.5
		4) Agree	79	29.3
		5) Strongly agree	51	18.9
21)	Through a proper medication history interview, one can stop a prescribing cascade in elderly patients.	1) Strongly disagree	23	8.5
		2) Disagree	33	12.2
		3) Neutral	85	31.5
		4) Agree	82	30.4
		5) Strongly agree	47	17.4
22)	Effective patient counselling by clinical pharmacists can reduce the incidence of prescribing cascades	1) Strongly disagree	12	4.4
		2) Disagree	38	14.1
		3) Neutral	65	24.1
		4) Agree	101	37.4
		5) Strongly agree	54	20.0
23)	The prescribing cascade increases the financial burden on patients.	1) Strongly disagree	13	4.8
		2) Disagree	27	10.0
		3) Neutral	81	30.0
		4) Agree	85	31.5
		5) Strongly agree	64	23.7
24)	It is important to identify and report the prescribing cascade to decrease morbidity and mortality in the elderly population.	1) Strongly disagree	13	4.8
		2) Disagree	20	7.4
		3) Neutral	54	20.0
		4) Agree	96	35.6
		5) Strongly agree	87	32.2
25)	In the elderly population, deprescribing minimizes the occurrence of a prescribing cascade.	1) Strongly disagree	19	7.0
		2) Disagree	41	15.2
		3) Neutral	103	38.1
		4) Agree	72	26.7
		5) Strongly agree	35	13.0
omain: Perception				
26)	Voluntary reporting of adverse drug reactions by patients is necessary.	1) Strongly disagree	11	4.1
		2) Disagree	19	7.0
		3) Neutral	44	16.3
		4) Agree	116	43.0
		5) Strongly agree	80	29.6
27)	Before administering or dispensing a medication, healthcare student should advise the patients about potential adverse drug reactions and its consequences.	1) Strongly disagree	2	0.7
		2) Disagree	14	5.2
		3) Neutral	32	11.9
		4) Agree	99	36.7
		5) Strongly agree	123	45.6
28)		1) Strongly disagree	9	3.3

	Each elderly patient's prescription should be regularly reviewed to identify and minimize the prescribing cascade.	2) Disagree	19	7.0
		3) Neutral	47	17.4
		4) Agree	116	43.0
		5) Strongly agree	79	29.3
29)	All elderly patients should get clinical pharmacy services to identify and resolve the prescribing cascade.	1) Strongly disagree	12	4.4
		2) Disagree	40	14.8
		3) Neutral	57	21.1
		4) Agree	94	34.8
		5) Strongly agree	65	24.1
30)	Those patients who are receiving more than 5 drugs require prescribing cascade monitoring and follow-up.	1) Strongly disagree	12	4.4
		2) Disagree	25	9.3
		3) Neutral	46	17.0
		4) Agree	101	37.4
		5) Strongly agree	86	31.9
31)	As a healthcare student, you are responsible for the identification and monitoring of patients for the prescribing cascade especially in elderly patients.	1) Strongly disagree	11	4.1
		2) Disagree	14	5.2
		3) Neutral	43	15.9
		4) Agree	104	38.5
		5) Strongly agree	98	36.3
32)	Healthcare student can be prepared to reduce the prescribing cascade by enrolling in a continuing education program.	1) Strongly disagree	12	4.4
		2) Disagree	18	6.7
		3) Neutral	64	23.7
		4) Agree	114	42.2
		5) Strongly agree	62	23.0
33)	Elderly patient's new medical conditions or symptoms after receiving medications should be reviewed to prevent prescribing cascades by healthcare students.	1) Strongly disagree	8	3.0
		2) Disagree	11	4.1
		3) Neutral	72	26.7
		4) Agree	100	37.0
		5) Strongly agree	79	29.3
Overall ratings of the questionnaire				
34)	How would you rate the overall questionnaire	1.	8	3.0
		2.	23	8.5
		3.	149	55.2
		4.	67	24.8
		5.	23	8.5

The majority (38.9%) correctly defined ADRs as "unwanted and unintended effects of drugs. "There does not seem to be a consensus on how ADRs are categorized, leading to some confusion. Most respondents (64.4%) acknowledge that older adults who take multiple medications and have multiple diseases are most likely to experience adverse drug reactions (ADRs). Most respondents (64.1%) think it is impossible to find every ADR before a drug is released onto the market, indicating knowledge of the limitations of pre-market testing.

A considerable percentage of respondents (89%) expressed agreement or strong agreement that, ADR reporting is their professional responsibility. The mandatory reporting of ADRs was deemed acceptable by a significant majority (84.1%) of respondents. The vast majority (78.1%) agreed or

strongly agreed that patients should be made aware of any possible ADRs associated with their prescription. Frequent monitoring of ADRs is necessary to improve patient care, and the majority (82.9%) agreed or strongly agreed with this statement. Most (80.4%) felt that healthcare students would benefit from proper training on identifying and reporting ADRs.

A large percentage of respondents (64.1%) admit that elderly patients frequently receive prescription cascades. Between 74.8% and 80.8% of respondents agree that it is the duty of healthcare professionals, including students, to recognize, track, and lessen prescribing cascades. Additionally, 73.7% to 80.4% of respondents think that education and training can be helpful in this area.

With most respondents (55.2%) rating it favourably, the questionnaire is generally well-received. A Cronbach's alpha score of 0.810 indicated that the questionnaires were reliable and had a high level of internal consistency. Average 10 minutes was taken to fill out the questionnaire.

Table 3: Time taken to fill the questionnaire.

Sl. No	Minutes	Frequency	Percentage
1.	5	24	8.9%
2.	6	4	1.5%
3.	7	11	4.1%
4.	8	13	4.8%
5.	9	1	0.4%
6.	10	90	33.3%
7.	11	6	2.2%
8.	12	15	5.6%

9.	13	9	3.3%
10.	14	3	1.1%
11.	15	49	18.1%
12.	16	1	0.4%
13.	18	2	0.7%
14.	20	36	13.3%
15.	21	1	0.4%
16.	25	1	0.4%
17.	30	4	1.5%

DISCUSSION

Nurses play a substantial role in strengthening the pharmacovigilance system. Most of the time, nurses monitor and administer the medications in the hospital. Hence, feel free to express their sufferings and any new symptoms. Henceforth, nurses can easily identify ADRs and PCs.[9]

Elderly patients, are more likely to develop ADRs. Often, they may be suffering from multiple diseases. Due to this, there may be a misinterpretation of ADR as a new health illness and the prescribing of a new drug for its management. This process is termed the prescribing cascade.[8]

This study revealed that, nursing students know the term ADR (38.9%). But little knowledge on its classification and predisposing factors. Four previous studies conducted in India also shown that nursing students have heard the term ADR, but lesser known about its classifications and risk factors.[10-13]

ADR future consequences is prescribing cascade, only 15.6% students are knowing this term. Fifty-five (20.4%) respondents are known that who coined the term PC. But majority opined that these cascades more often seen in elderly (64.1%) and who are on polypharmacy (65.9%). 207 (76.7%) students felt that it is very difficult to distinguish between an ADR and a medical condition especially in elderly population. As per the PubMed and google scholar no research studies are carried on this topic to compare these findings.

Majority (89%) of the students expressed reporting of ADR is one of their professional responsibilities and opined that reporting should be made mandatory (84.1%). Even expressed that, each patient should be aware of ADR while they are receiving medications (78.1%). Suitable training or awareness program helps to improve their knowledge, identify and report ADRs and PCs. The findings of our study like previous studies conducted by Sachidananda and Ekman.[14-16]

Most of the students (64.1%) aware that PCs seen more frequently with elderly patients. Hence, they opined to track these cascades and to minimize it. Sensitization programme 73.7% to 80.4% on PCs helps to know better about it and to minimize in their upcoming professional life.

CONCLUSION

This study concluded that, participants have knowledge about ADR and its consequences. But need of educational and training programmes on ADR and PC will help them to minimize the incidence of both in their future professional life.

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CONFLICT OF INTEREST

There is no conflict of interest.

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