A STUDY ON PHARMACY STUDENTS PERCEPTION AND ATTITUDE TOWARDS PATIENT CARE

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ABSTRACT

BACKGROUND: Pharmacy education is evolving rapidly world-wide, with significant changes to the education curricula, strategies and modes of delivery. Providing comprehensive patient care is an essential Component of all healthcare professionals (HCPs).

OBJECTIVE: To assess the attitude and perception of pharmacy students towards patient care and analyse the knowledge of pharmacy students in Pharmacovigilance.

METHODOLOGY: A prospective observational study including Pharm.D and B. Pharm Students of final year, 1st and 2nd years M.Pharm, Pharm.D 5th years and interns were included in this study. Assessing attitude and perception of students by PCAS (Pharmaceutical Care Attitude Scale) tool was used and a 10 questions based knowledge of pharmacovigilance were used. **RESULTS:** A total of 132 pharmacy students were included in this study. Gender-wise male respondents were more than female respondents. PCAS tool is based on the professional attitude, professional duty and return of efforts. To assess the knowledge of pharmacovigilance yes or no questions were used, yes =1 and no= 0 was given as a score. Median, percentage, standard deviation and Pearson correlation was performed for both PCAS pharmacovigilance based knowledge questions. **CONCLUSION:** The outcome of the study proved that students had positive attitude towards patient care. Knowledge of Pharmacovigilance was very good among the students.

KEY WORDS: Pharmacovigilance, pharmacy students, PCAS tool.

INTRODUCTION

India is the second most populous country on the planet. In India, formal pharmacy education leading to a degree began with the introduction of a 3-year bachelor of pharmacy (B.Pharm) at Banaras Hindu University in 1937. At that time, the curriculum was presented as a combination of pharmaceutical chemistry, analytical chemistry, and pharmacy, which prepared graduates to work as specialists in quality control and standardization of drugs for pharmaceutical companies, but not for pharmacy practice. In the year 1996, Jagadguru Sri Shivaratreeswara (JSS) College of pharmacy at Mysore introduced the Master degree in Pharmacy Practice and later in 1997, in Ooty [9]. The Pharm.D program was introduced in 2008 with the aim of producing pharmacists who had undergone extensive training in practice sites and could provide pharmaceutical care to patients.

All the process towards the development of pharmacy education is to produce patient-oriented health outcome. Duties of pharmacists were limited to compounding and dispensing. The role of pharmacists got changed now, it is being more clinical and patient care focused. The concept of pharmaceutical care (PC) has been introduced as one of the emerging services in the pharmacy field [12]. In 2013, the Pharmaceutical Care Network Europe reviewed PC definitions with the objective to redefine PC, the consequences were to define PC as: “the

pharmacist's contribution to care of individuals in order to optimize medicines use and improve health outcomes.

Pharmaceutical care means that pharmacists should assess, monitor, and counsel patients, set objectives, document, and perform a variety of other activities and collaborate with other healthcare providers, in order to optimize patient oriented services, improve outcomes and patients 'quality of life and offer care alongside the product. Pharmaceutical care is beginning from the hospital pharmacy set-up to the community pharmacy. Also offering PC services in different therapeutic areas demonstrated significant improvement in outcomes, mainly in identifying and preventing drug related problems [24].

PC is widely practiced in the parts of the world with more advanced health settings. PC is also introduced in community pharmacy and hospital pharmacy. Creating a positive attitude among pharmacists towards PC is the cornerstone in implementing and expanding PC services [2].

Moreover, the importance of PC is given by the topics of PC which act as the futuristic PC career [18]. These topics include medication history taking, patient counseling, reporting adverse drug reactions (ADRs), procedure for checking a prescription, record keeping, etc., Community pharmacists are the most accessible healthcare professionals to public to have their medication and advice about their health condition. Community pharmacy practice differs from one country to another. Pharmacy education is evolving rapidly worldwide, with significant changes to the education curricula, strategies and modes of delivery. Providing comprehensive patient care is an essential Component of all healthcare professionals (HCPs) [20]. Pharmacy students constitute a better educated group of society regarding the use of drugs and they are required to grasp the appropriate knowledge of drug use and have positive attitudes toward healthcare issues. It is a well-known fact that 'No drug is inherently safe'; unless it has no effect at, all although considered a boon for community humanity, drugs can impart adverse effects. In this regard, drug safety monitoring becomes an indispensable facet in ensuring effective use of medicines and providing quality healthcare. Pharmacovigilance, the science which primarily deals with adverse drug reactions (ADR) monitoring is an integral part of patient care [17]. Good pharmacovigilance practice allows for the effective communication of medication associated risks, intelligent and evidence-based use of medicines and has the potential for preventing many adverse reactions. The objective of the study was to categories the students based on qualification, assess the attitude and perception of pharmacy students towards patient care, assess the knowledge of pharmacy students in Pharmacovigilance. Overall aim of the study to assess the pharmacy student's attitude, perceptions towards patient care.

MATERIALS AND METHODS

After obtaining approval from the Institutional Ethical Committee, the prospective observational study was carried out in PSG College of Pharmacy, Peelamedu, Coimbatore. This study was conducted during a period of 6 months from May 2021 to October 2021. All

the pharmacy program students were included in the study. Most of the students were from final years of their programme we included both UG and PG students. Data Collection form was designed using PCAS (Pharmaceutical Care Attitude Scale), which is pre validated questionnaire and to assess the knowledge on pharmacovigilance a 10 questioned 'yes' or 'no' were used in the study.

Inclusion criteria

- 5^{th} year Pharm.D students and Interns
- Final year B.Pharm students
- Other Graduated students

Exclusion criteria

- 1^{st} - 3^{rd} year B.Pharm students
- 1^{st} – 4^{th} year Pharm.D students
- Other Gradutaed students
- Arrear students
- Student not willing to participate.

METHODOLOGY

This is a prospective observational study with the aim to assess the attitude and perception among students on patient's care. The study was performed at the PSG College of Pharmacy for a period of 6 months. Sample collection was based on the inclusion and exclusion criteria. Data was collected from the students using google forms. A total of 132 responses was received. To assess the attitude, Perception using 5 pointer likert scale, it is divided into 3 categories professional benefits, professional duty and return of efforts. Strongly agree =5 points, agree=4 points, Neutral=3 points, disagree=2, strongly disagree=1. To assess the knowledge on pharmacovigilance we used 10 question scale YES valued 1 and NO valued 0. This study is not accompanied with any kind of risk, attitude and perception level of pharmacy students towards patient care can be evaluated. Pharmacists are key players in pharmacovigilance, which is the science of monitoring and preventing adverse drug reactions to assess the knowledge of students in pharmacovigilance.

STATISTICAL ANALYSIS

Data was described in terms of frequency, percentage, tables, Diagrammatic representations and graphs. Also Pearson correlation was determined between professional duty, professional benefits and return of efforts against pharmacovigilance. All statistical calculations were done using SPSS V21.0.

RESULTS

A total of **132** pharmacy college students doing their under-graduation and post-graduation degree program participated in the study. The participant was classified based on their age into three categories. Category 1 is less than or equal to 21 years, category 2 is 22-23 years and category 3 is 24-26 years of age. Mean age was 23 years.

Table 1. Age Wise Classifications

AGE	TOTAL .NO.OF. PARTICIPANTS (N)	ERCENTAGE (%)
≤ 21 years	4	3%
22-23 years	82	62%
24-26 years	46	35%

Among 132 students enrolled in the study 48 were female and 84 were male. Male students were predominant. Percentage of female students participated in the study is less (36%) compared to male students participated in the study.

Table 2 Gender Wise Classifications

Gender	Number of participants(N)	Percentage (%)
Male	84	64%
Female	48	36%

REASON FOR STUDYING PHARMACY DEGREE

A lot of reasons may influence the students behavioral and interest on their studies and the attitude of students towards their professional role. Therefore, the reason for studying pharmacy degree differed as self-will, forced by family, influence by friends or seniors, others. In the study students with self-will (80.30%) was found to be more compared to any other reason below.

Table 3-Reason For Studying Pharmacy Degree

FACTORS	**TOTAL PERCENTAGE**
SELF WILL	80.30%

FORCED BY FAMILY	3.79%
INFLUENCE BY FRIENDS OR SENIORS	5.30%
OTHERS	10.61%

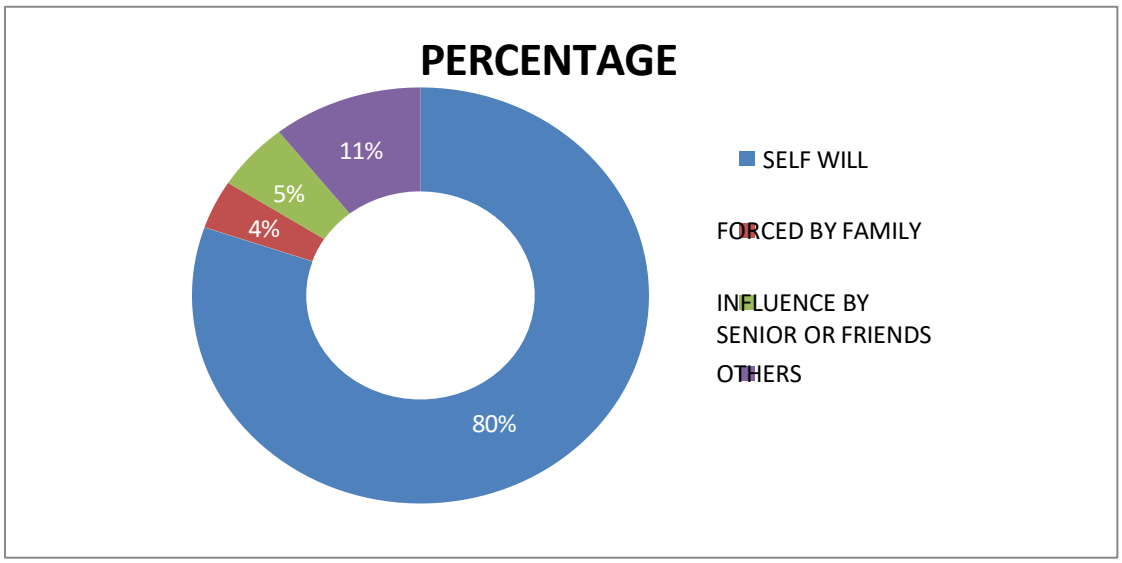

Figure 1- Diagram representing the reason of students studying pharmacy degree.

WHAT KIND OF TRAINING STUDENTS ENGAGED WITH?

Based on the interest students are engaged with certain kind of training program like community pharmacy, hospital pharmacy, and pharmaceutical industrial training.

Table 4-Training of Students in Various Fields

FIELD	**TOTAL PERCENTAGE**	**N**
COMMUNITY PHARMACY	12.88%	17
HOSPITAL PHARMACY	24.24%	32
PHARMACEUTICAL INDUSTRY	58.33%	77
PHARMACEUTICAL MARKETING	4.55%	6

Among these pharmaceutical industry had a lot of training for students it's was 58.33% and

for hospital pharmacy and community pharmacy 24.24% and 12.88%. The minimum was for pharmaceutical marketing 4.55%.

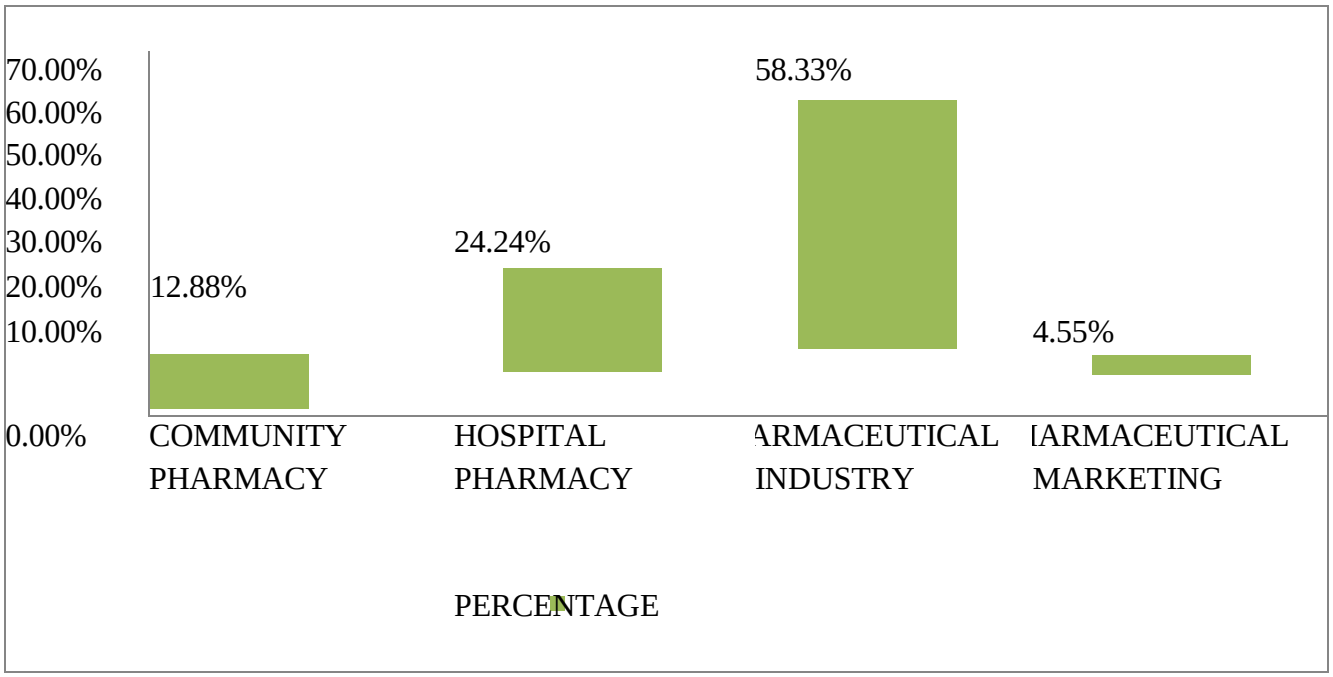

Figure 2- Graph showing the percentage of field students got trained.

WHAT IS THE FIELD OF INTEREST AFTER COMPLETION OF YOUR PHARMACY DEGREE?

Field of interest after completing pharmacy degree was found to be more positive towards to pharmaceutical industry. Other than pharmaceutical industry, hospital industry got more positive answers. Both male and female students got interest in pharmaceutical industry. Student's interest towards community pharmacy and hospital pharmacy was found to be less compared to pharmaceutical industry. Hence this may affect the attitude of students in their healthcare profession.

STUDENTS ATTITUDE AND PERCEPTION TOWARDS PATIENT CARE

Study involved accessing the attitude and perception of pharmacy students towards patient care using PCAS ITEM (Pharmaceutical Care Attitudes Survey). The Pharmaceutical Care Attitudes Survey was divided into three categories they were Professional Duty, Professional benefits and Return of efforts.

RESPONSES FOR PROFESSIONAL DUTY:

FESSIONAL DUTY	**STRONGLY AGREE (%), N**	**AGREE (%), N**	**NEUTRAL (%), N**	**DISAGREE (%), N**	**STRONGLY DISAGREE (%), N**
1. All pharmacists should perform pharmaceutical care	(57.58) 76	(28.03) 37	(11.36) 15	(1.52) 2	(1.52) 2
2. Primary responsibility of pharmacists in all health care settings should be to prevent and solve medication-related problems	(45.45) 60	(42.42) 56	(10.61) 14	(1.52) 2	-
3. Pharmacists primary responsibility should be to practice pharmaceutical care.	(32.58) 43	(50.00) 66	(13.64) 18	(1.52) 2	(2.27) 3

Table-5 describes the Professional duty questionnaire among the PCAS item.

For professional duty most of the students had answered strongly agree with questions 1 and 2, but for question 3 the maximum answer was found to be agree.

Median	13 **out of 15**	**IQR 12-14**
Standard deviation	±0.8224	

Table 6-Represents statistical data of professional duty.

RESPONSES FOR PROFESSIONAL BENEFITS

Among the PCAS scale question number 4, 5, 7, 8, 9, 10, 11 and 12 represents professional benefits.

PROFESSIONAL BENEFITS	STRONGLY AGREE(%), N	AGREE (%),N	NEUTRAL (%) ,N	DISAGREE (%),N	STRONGY DISAGREE (%),N
4. Pharmacy students can perform patient care during them clerkship/internship	(27.27) 36	(53.03) 70	(16.67) 22	(2.27) 3	(0.76) 1
5. I think the practice of patient care is valuable.	(43.51) 57	(43.51) 57	(9.92) 13	(3.05) 2	-
7. I would like to perform patients care as a pharmacist practitioner.	(37.12) 49	(45.45) 60	(12.12) 16	(3.79) 50	(1.52) 2
8. Providing patient care is professionally rewarding.	(30.30) 40	(47.73) 63	(18.18) 24	(3.79) 5	-
9. I feel that patients care is the right direction for the professional to be headed.	(28.03) 37	(41.67) 55	(20.45) 27	(9.85) 13	-
10. I feel that the patients care movement would benefit pharmacists.	(27.27) 36	(53.03) 70	(15.15) 20	(2.27) 3	(2.27) 3
11. I feel that the patients care movement will improve patient health.	(43.18) 57	(44.70) 59	(12.12) 16	-	-
12. I feel that practicing patients care will benefit my professional career as a pharmacy practitioner.	(34.85) 46	(51.52) 68	(10.61) 14	(3.03) 4	-

Table 7- Represents the responses of professional benefits.

Median	**33** out of 40	**IQR 30-36**
Standard deviation	**±0.8147**	

Table 8- Represents the statistical data of professional benefits.

The median score obtained for professional benefits was found to be 33 out of 40 which was found to have ±0.8147 deviation this is a positive response towards PB. This means student's expectation for their work is increased, they expect for a quality health out come from the patients as a sign of good work.

RESPONSES FOR RETURN OF EFFORTS

Among the PCAS questionnaire 6 and 13 are return of efforts questions in the answers are reversely scored. For this type of questions strongly disagree was given 5, disagree-4, neutral-3, agree-2, strongly agree-1 as the scores because it is negatively phrased questions.

RETURN OF EFFORTS	STRONGLY AGREE(%),N	AGREE (%),N	NEUTRAL (%),N	DISAGREE (%),N	STRONGLY DISAGREE (%),N
6. Providing patient care takes too much time and efforts.	(13.64) 18	(51.52) 68	(27.27) 36	(3.79) 5	(3.79) 5
13. Providing patients care is not worth the additional workload that it places on the pharmacist.	(10.61) 14	(31.82) 42	(27.27) 36	(24.24) 32	(6.06) 8

Table 9- Represents the responses for return of efforts.

Median	**5** out of 10	**IQR 4-6**
Standard deviation	**±1.0324**	

Table 10 -Represents the statistical data of return of effects.

KNOWLEDGE OF PHARAMCOVIGILANCE

As a part of study pharmacy student knowledge towards Pharmacovigilance was tested, using a 10 question yes or no scale. A total of 10 points was used, student are then ranked accordingly as sufficient knowledge, no or little knowledge. Marks obtained from the questions was divided into two categories**0-4 no or little knowledge and 5-10 sufficient knowledge.**Answer "yes" is given 1 point and "NO" is given 0 points.

QUESTIONS	**YES (%),N**	**NO (%),N**
1. I know how to report ADRs to the relevant authorities.	(68.18) 90	(31.82) 42
2.Students can perform adverse drug reactions reporting during their clinical clerkship.	(86.36) 114	(13.64) 18
3.The topic of Pharmacovigilance is well covered in my curriculum.	(65.15) 86	(34.85) 46
4. Reporting of known ADRs makes a significant contribution to the reporting system.	(83.33) 110	(16.67) 22
5. I know the different classifications of ADR.	(81.82) 108	(18.18) 24
6. Hypersensitivity reactions are related to ADR.	(84.09) 111	(15.91) 21
7. There is a difference between ADR and adverse event.	(81.06) 107	(18.94) 25
8. I know the different types of hypersensitivity reactions.	(84.09) 111	(15.91) 21
9.I know what Post-Marketing Surveillance is	(63.64) 84	(36.36) 48
10.I know how the Causality Assessment of ADR is done	(62.12) 82	(37.88) 50

Table 11-shows the response for Pharmacovigilance.

Statistical test	p-value
Chi square test	0.004*
Mean	7.939

Table -12shows the statistical test of Pharmacovigilance responses

***p-value <0.05**

RELATIONSHIP BETWEEN PROFESSIONAL DUTY, PROFESSIONAL BENEFITS AND RETURN OF EFFORTS Vs PHARMACOVIGILANCE

Professional benefits, professional duty has got some importance and a positive correlation with knowledge of Pharmacovigilance whereas return of effects is got negative correlation.

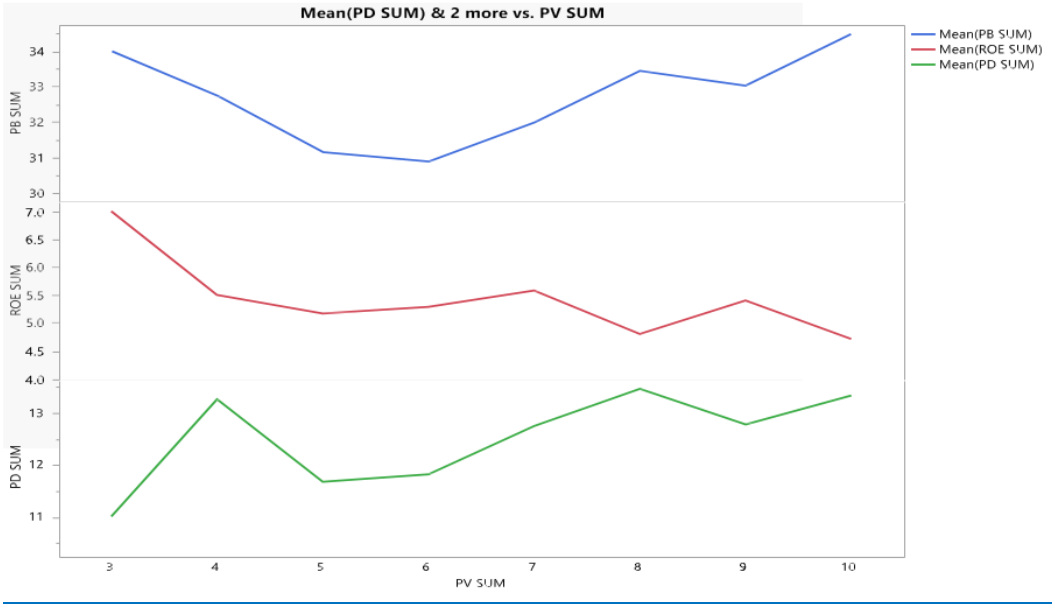

Figure 03-graph showing the relationship between professional duty (PD), professional benefits (PB) and return of effects (ROE) Vs. Pharmacovigilance (PV).

This graph shows that with the attitude of professional duty, professional benefits and return of efforts affects the knowledge of students. When the PD and PB score increases the knowledge of pharmacovigilance increases, whereas in ROE when the ROE score is low the knowledge of pharmacovigilance increases. ROE is a negatively phrased attitude question; hence the value for ROE decreases the knowledge of pharmacovigilance increases.

TERMS	PEARSON CORRELATION	P-Value
Professional Duty Vs. Pharmacovigilance	**+0.255706**	**0.6130**
Professional Benefits Vs. Pharmacovigilance	**+0.235337**	**0.6276**
Return of effects Vs. Pharmacovigilance	**-0.14526**	**0.7031**

Table 13-gives the correlation between professional duty, professional benefits and return of affects Vs Pharmacovigilance.

Yet the p-value got no significant the correlation values show that professional duty, professional benefits got positive correlation with Pharmacovigilance whereas return of efforts got negative correlation with Pharmacovigilance. This shows that students had positive attitude towards the patient care, students with positive attitude had good knowledge on pharmacovigilance. The least score on pharmacovigilance was found for that students are not clear about their role in causality and the assessment of ADR among pharmacy students in causality is very low.

DISCUSSION

Patient care being the major role of pharmacists and clinical pharmacists, their attitude towards work must be more positive for the benefit of patient. One of the services rendered by members of the healthcare professional includes the adverse drug reaction monitoring their knowledge in Pharmacovigilance is identifying and reporting an adverse drug reaction. This study involved two kinds of questionnaire and question pattern for assessing students' attitude and perception towards patient care were 5 point likert scale PCAS tool and yes or no questions for assessing the pharmacovigilance knowledge.In this study the gender and age doesn't have any association between the attitude of pharmacy students towards patient care ,but study done in Nepal by sanjay raj Baral .,[32] concluded that attitude towards patient care got some positive correlation with age.

Pharmaceutical care (PC) has a significant impact on optimizing pharmacotherapy and improving patients' quality of life. They aimed to determine the attitudes and perceived barriers of final year pharmacy undergraduates towards provision of PC services by sanjai raj Baral, et al. [32]. Similar to this study we aimed on the final year B.pharm, M.pharm and pharm.D students. Nepalese undergraduate pharmacy students had positive attitudes toward PC. Exercising proper pharmacy practice regulations and educational efforts to overcome the perceived barriers may lead to better delivery of PC [32]. Students involved in this study got positive attitudes even the return of efforts median score was found to be **5** which was only half of the score, that showed students disagree patient care takes too much of time which was similar to the study conducted by Henok, et al [34],[2], [32]. A study conducted by martin and Chisholm [34] showed the disagreement that patient care takes too much time and

efforts. There are other, but few studies describing pharmacy student attitudes toward PC. Both American and Saudi pharmacy students indicate favorable positive attitudes toward PC and agree that that all pharmacists should perform PC[40]. Pharmacy students have the overall good attitude to patient safety. However, they claimed the culture and attitude within the pharmacy workplace lacked for patient safety.

The students should be engaged in the entire patient care process from initial assessment through documentation to follow-up evaluation. Students can then review their own performance with their pharmacy preceptors to determine their command of the PC concept [43], through this student can develop their patient assessment and care planning skills. PC is a multifaceted process that involves identifying, preventing, and resolving drug therapy problems. Associated with this process is the delivery of proper pharmaceutical services, which include obtaining patient history, evaluating laboratory data, and reviewing patient records [45,46]. Another of the students' perceived barriers for PC provision is the poor image of the pharmacist role in our society. Study in Qatar found that barrier for providing pharmaceutical care is lack of access to the patient medical record and inadequate drug information sources in the pharmacy, but in this study doesn't discuss about the barriers that prevent patient care.

In this study found that students belonging to under-graduation and post-graduation had positive outcome towards patient care similar to the studies done in UAE. PaCIR-Pharmacists Patients Care Intervention Reporting checklist will enhance the quality of reporting in intervention studies, this enhanced quality can support replication of the studies and increase the likelihood [37]. These studies will be considered for inclusion in systematic reviews and meta-analyses. Based on these studies report we placed a new question to know whether the students are aware of the pharmacist's intervention checklist, 50% of the students know what is a PaCIR checklist and also 40% of the students do not know what is a PaCIR checklist.

From this we could know that the negative score for the new question is increased, hence knowledge on pharmacist's patient intervention checklist must be improved.

None of the study done in India so far has related pharmaceutical care with the knowledge of Pharmacovigilance. As per studies done so far states that healthcare professionals had knowledge towards ADR reporting is better and their commendable attitude towards a uniform structured system of ADR reporting. It identified the factors discouraging ADR reporting and emphasized on spontaneous ADR reporting [39].

Also a cross sectional study done in Malaysia stated that all the healthcare professionals, Pharmacists had better knowledge about ADR reporting and Pharmacovigilance. All healthcare professionals had a positive attitude and inclination towards ADR reporting. The study also suggested to provide healthcare professionals education, training and empower the healthcare professionals in the area of Pharmacovigilance [40]. Study on knowledge of Pharmacovigilance done in Tamilnadu concluded that Educational intervention had proven to be an effective tool in improving the

KAP of PV in the present study. Revisions to include the application of PV in medical practice should be the necessary step in the present academic curriculum. Awareness about PV and ADRs should be given priority. This knowledge would help them to detect adverse effects and report to the concerned authorities. Educational intervention on a routine basis for the PGs and other health professionals can increase the number of adverse events reporting in the tertiary care center [41]. This study concluded that students had got sufficient knowledge towards. Pharmacovigilance; the only think they lack is how causality assessment of ADR is done, they were more conscious about their role during internship. Students posted for ward rounds are aware that they can practice ADR reporting.

CONCLUSION

The outcome of the study conducted on attitude and perception towards patient care among pharmacy students proved that students had positive attitude towards patient care. The overall the attitude of students towards professional benefits and duty had more positive attitude compared to return of efforts to their profession. Students had positive attitude irrespective of their age and gender. The PaCIR was well known by the students; also they were aware of ADR reporting during their clerkship. From the assessment of Pharmacovigilance knowledge it was clear that students were not having knowledge on how causality assessments of ADR was done, as well as they were well known how to report an ADR to the authorities during their clerkship. Knowledge of Pharmacovigilance was very good among the students. To improve the attitude of students towards patient care standardized patient safety course can be included in the curriculum for pharmacy students.

When student's attitude towards patient care is low it negatively affects the knowledge of Pharmacovigilance among students. The other three attitudes like professional duty and professional benefits had positive effect in the knowledge of Pharmacovigilance. Pharmaceutical marketing was the least preferred by students; hence their curriculum must include a hands-on training program in pharmaceutical marketing. Students had less knowledge about how causality assessment of ADR was done. So there is need of Causality training for students to minimize the lack of knowledge in causality assessment.

LIMITATION OF THE STUDY

- This study was carried out only in single institute students.
- The barriers of pharmaceutical care were not studied.
- PaCIR check list must be studied elaborately.
- Attitude of students towards ADR reporting was not included.
- Other healthcare professional students are not included.

REFERENCES

1. Michael Dooley, et al. Reducing medication related harm through the adoption of technology, Journal of Pharmacy Practice and Research. 2021, 8(2), 85.

2. Ali M. Tawfiq, et al. Nationwide survey on attitudes and perceived barriers toward provision of pharmaceutical care among final year undergraduate pharmacy students in the United Arab Emirates. PLOS ONE, 2021.
3. Mohd Shahezwan Abd Wahab, et al. Pharmacy students' attitudes and perceptions about complementary and alternative medicine: a systematic review. TJPS 2016, 40 (2), 102- 114.
4. Abdallah Y Naser, et al. Attitudes of pharmacy students towards patient safety: a cross-sectional study from six developing countries. BMJ Open 2020, 10.
5. Achaia Srikanth Bhagavathula, et al. The Attitude of Medical and Pharmacy Students towards Research Activities: A Multicenter Approach. Pharmacy 2017, 5-55.
6. Ankur Joshi, et al. Likert scale: Explored and Explained. British journal of applied science & Technology. 2015,853-865.
7. F. A. Alqenae et al. Prevalence and Nature of Medication Errors and Medication Related Harm Following Discharge from Hospital to Community Settings: A Systematic Review. Drug Safety (2020) 43: 517–537.
8. World Health Organization. Global patient safety challenge: medication without harm. 2017, 1–16.
9. Shreya Bhandary, Pharmacy seats across India up by nearly 30% in a year. Hindustan times, May 19, 2019.
10. Frydenberg K, Brekke M. Poor communication on patient's medication across health care levels leads to potentially harmful medication errors. Scand J Prim Health Care. 2012, 30, 234–240.
11. Parekh N, et al. Incidence of medication-related harm in older adults after hospital discharge: a systematic review. J Am Geriatric Soc. 2018, 66: 1812–1822.
12. Vessal G, et al. Knowledge, attitudes, and perceptions of pharmacists to ADR reporting in Iran. Pharm World Sci 2009, 31,183-188.
13. Medication Therapy and Patient Care: Organization and Delivery of Services–Statements by American Society of Health Care Pharmacists.
14. The safety of medicines in public health programmes: pharmacovigilance an essential tool World Health Organization 2006
15. Meher BR, Joshua N, Asha B, Mukherji D. Awareness of Pharmacovigilance among undergraduate medical students. Perspect Clin Res. 2015; 6(4):217-221.
16. Schutte T, Tichelaar J, Reumerman MO, van Puijenbroek EP, Richir MC, van Agtmael MA. Learning by doing in the student-run pharmacovigilance programme. Clin Therap. 2017; 39(8):2.
17. Gaude OS, Sa SD. Assessment of knowledge, attitude, and practices of Pharmacovigilance and adverse drug reaction reporting among final year medical students- a questionnaire-based study in a tertiary care hospital in Goa. Nat J Physiol Pharm Pharmacol. 2018; 8(12):1657-1661.
18. Al-Arifi, M.N., 2012. Patients' perception, views and satisfaction with pharmacists' role as health care provider in community pharmacy setting at Riyadh, Saudi Arabia. Saudi Pharm. J. 20(4), 323–330.
19. May RM. Barriers to pharmaceutical care in acute care setting. Am J Hosp Pharm. 1993; 50:1608-1611.

20. Al-Arifi MN. Pharmacy students' attitudes toward pharmaceutical care in Riyadh region Saudi Arabia. Pharm World Sci. 2009; 31(6):677–681.
21. Chisholm MA, Martin BC. Development of an instrument to measure student attitudes concerning pharmaceutical care. Am J Pharm Educ. 1997; 61: 374- 379.
22. Martin BC, Chisholm MA. Cross-validation of an instrument measuring student's attitudes toward pharmaceutical care. Am J Pharm Educ. 1999; 63: 46-51.
23. Udeogaranya PO, et al. Assessment of attitudes of University of Nigeria pharmacy students toward pharmaceutical care. Pharm Pract. 2009; 7(3):145–149.
24. Sanjay raj baral.etc al.., Undergraduate pharmacy students' attitude and perceived barriers toward provision of pharmaceutical care: a multi- institutional study in Nepal. Integrated pharmacy research and practice. 2019, 8, 47-59
25. Katoue MG, et al. Pharmaceutical care education in Kuwait: pharmacy students' perspectives. Pharm Pract (Granada). 2014; 12 (3)
26. Martin BC, et al. Cross-validation of an Instrument Measuring Students Attitudes toward Pharmaceutical Care. Am J Pharm Educ. 1999; 63: 46–51.
27. Martinez Sanchez AM, et al. Assessment of Attitudes of Cuban University Pharmacy Students Toward Pharmaceutical Care. Indian J Pharm Educ. 2016; 50(4): 504–511.
28. Tsega B, et al. Impact of clerkship attachments on students' attitude toward pharmaceutical care in Ethiopia. Adv Med Educ Pract. 2015, 6, 385–391.
29. Ahmed N, et al. The Attitudes and Perceptions of Pharmacy students toward applying Pharmaceutical care after Graduation in Alkharj city. Bull. Env. Pharmacol. Life Sci. 2017; 6(9): 1–4
30. Awaisu A, et al. Self-reported attitudes and perceived preparedness to provide pharmaceutical care among final year pharmacy students in Qatar and Kuwait. Pharmacy Education. 2018; 18(1): 284–291.
31. El Hajj MS, et al. Pharmacy students' attitudes toward pharmaceutical care in Qatar.TherClin Risk Manag. 2014, 10: 121–129.
32. Chisholm MA, et al. Development of an instrument to measure student attitudes concerning pharmaceutical care. Am J Pharm Educ. 1997, 61: 374–379.
33. Udeogaranya PO, et al. Assessment of attitudes of University of Nigeria pharmacy students toward pharmaceutical care. Pharm Pract. 2009, 7 (3):145–149.
34. Henok Getachew Tegegan., et al. patient safety attitude of pharmacy students in an Ethiopian University: a cross-sectional study. Drug health and patient safety, 2017, volume: 9, 19-24.
35. Ngorsuraches S, Li SC et al. Thai pharmacists' understanding, attitudes, and perceived barriers related to providing pharmaceutical care. Am J Health Syst Pharm. 2006; 63(21): 2144–2150.
36. Farris KB, et al. Pharmaceutical care in community pharmacies: practice and research from around the world. Ann Pharmacotherapy. 2005; 39(9):1539–1541.
37. Patrick G., et al. PaCIR: A tool to enhance pharmacist patient care intervention reporting. Journal of the American Pharmacists Association.2019, 1-9.
38. Meredith Y. Smith., et al. The Patient's voice in Pharmacovigilance: Pragmatic Approaches to Building a Patient-Centric Drug Safety Organization. Drug safety. Volume: 39, 2016, 779-785.

39. V. Srinivasan, et al. Knowledge, attitude and practice of Pharmacovigilance among the healthcare professionals in a Tertiary care hospital-A Questionnaire Study. Biomedical and Pharmacology Journal. Vol.10 (3), 2017, 1441-1447.
40. Hussain R., Hassali, M.A., Hashmi, F. et al. Exploring healthcare professionals' knowledge, attitude, and practices towards Pharmacovigilance: a cross-sectional survey. J of Pharm Policy and Pract, 2021, 5, 14.
41. Panneerselvam N, et al. Impact of educational intervention on the knowledge, attitude, and practice of Pharmacovigilance among postgraduates of a tertiary care center, Kanchipuram, Tamil Nadu, India. Perspectives in clinical research, 2021.
42. Inman WH, et al. Attitudes to adverse drug reaction reporting. Br J Clin Pharmacol 1996, 41, 434-435.
43. Abubakar AR, et al. A systematic review of knowledge, attitude and practice on adverse drug reactions and Pharmacovigilance among doctors. J Appl Pharm Sci 2014, 4:117-127.
44. Bhagavathula as, et al. Health professionals' knowledge, attitudes and practices about Pharmacovigilance in India: a systematic review and meta-analysis. Plops one, 2016, 11 (3).
45. Awosan KJ et al., Knowledge, attitude, practice of Pharmacovigilance among operators of pharmacies and patent medicine stores in sokoto metropolis, Nigeria. Journal of drug delivery and therapeutics, 2018, 8(5), 358-364.
46. Elizabeth E. Roughead BPharm, et al. The extent of medication errors and adverse drug reactions throughout the patient journey in acute care in Australia. International Journal of Evidence-Based Healthcare.2016, 113-122
47. Tahmine Salehi, et al. Nurses' Knowledge, Attitudes, and Practice in Relation to Pharmacovigilance and Adverse Drug Reaction Reporting: A Systematic Review. BioMed Research International.2021, 1-12.
48. A. R. Abubakar, N. B. Simbak, and M. Haque, "A systematic review of knowledge, attitude and practice on adverse drug reactions and Pharmacovigilance among doctors," Journal of Applied Pharmaceutical Science., 2014. VOL- 4, 117–127.
49. M. Vaismoradi, S. Jordan, and M. Kangasniemi, "Patient participation in patient safety and nursing input–a systematic review," Journal of clinical nursing. 2015, vol. 24 (5,6), 627–639.
50. F. R. Varallo, S. O. P. Guimaraes, S. A. R. Abjaude, and P. C.Mastroianni, "Causes for the underreporting of adverse drug events by health professionals: a systematic review," Revista da Escola de Enfermagem da USP. 2014, 48(4) 739–747.