



Assessment of Knowledge, Attitudes and Practices among Community Pharmacists in Lahore Regarding Prescription Patterns in Children: A Cross Sectional Study

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

Background: Community pharmacists play a vital role in ensuring that pediatric patients utilize drugs safely and effectively. Pediatric patients require special attention. To identify possible gaps in their knowledge of proper dosage, formulation selection, pharmacists' knowledge, and practices of pediatric prescriptions must be evaluated. These assessments help pharmacists become more competent in handling of pediatric prescriptions, and accurately counselling caretakers. Targeted evaluation can be assessed to ensure pediatric care with lower medication errors in pediatric prescriptions.

Objective: The purpose of this study is to evaluate the knowledge, attitudes, and behaviors of retail pharmacists (KAPs) in Lahore's community pharmacies regarding the prescription patterns of pediatric patients.

Methods: The cross-sectional, observational study was conducted in different community Pharmacies in Lahore, Pakistan. Data was collected on validated questionnaire after getting consent from 133 Pharmacists. 24th Edition of SPSS was used for statistical analysis of the collected data. Pharmacists who refuse to fill the form were excluded from the study.

Results: A total of 133 Pharmacists participated in the current study. A statistically significant association was observed between the pharmacists gender and their level of knowledge regarding prescription pattern in pediatrics with a p-value of <0.001. However, a statistically non-significant association was found between Pharmacists having higher education (MPhil, Ph.D., Graduate) and knowledge about prescription pattern in pediatrics with a p-value of 0.879.

Conclusion: Pharmacist can offer pediatric medication counselling to parents and children who are comfortable with it, even though Childrens are rarely present at pharmacies when prescriptions are taken up. For the purpose of facilitating counselling and educating children about the safe and effective use of medications, pharmacists must create and employ interactive and instructional technologies.

Keywords: Prescription pattern; pharmacist; community pharmacies; retail pharmacists; Lahore; chi square test; fischer's exact test; phi-square; pharmacy practice.

1. INTRODUCTION

Rational use of drugs is a foundation for a better and effective healthcare mainly in populations such as children that usually don't have fully developed and matured immune system also being in a growing stage such that in them the repercussion of inappropriate medication practise could be very serious and sometimes in extreme cases could prove to be fatal [1]. Children are more prone to medication error and in them side effects are also more severe as compared to adults [2]. As well as medical management of children throughout medication process is kind of different when you compare them with adults [3]. It comprises of various complicated challenges due to the fact that there exists social as well as physical differences therefore at a community pharmacy level handling of children prescription by a pharmacist is of great importance [4]. The pharmacist should be well aware of different diseases prevailing in children what are the general practises being carried out also attitude of pharmacist towards approaching this issue is of great importance [5].

A pharmacist should be well aware of doses especially in children in which dose regulation is of great importance [6]. When it comes to antibiotics a pharmacist should be well aware of the fact that which antibiotic would work best in which condition what should be the dose of antibiotic by assessing the age, weight and condition of disease of the paediatric patients [7]. The pharmacist should be well aware of the feedback coming majorly from the parents or guardian of the children that what were some of the common side effects that appeared in their children after taking prescribed antibiotic or any other medication [8]. As according to WHO the main reason that is behind the antibiotic resistance issue is the factor that antibiotics are inappropriately used to very great extent [9]. It has been observed on pharmacies that there is no proper counselling by the pharmacist to the parents or guardian of children [10].

Attitude of a pharmacist towards their profession is of great importance as the basic duty of a pharmacist is to make sure of the fact that there is a safe and effective use of medications [11]. Especially in children also due to the age factor it

would not be best to guide children about the medication therefore it is duty of pharmacist to properly guide and console the parents or guardian of the children ensuring that there would not be any issues regarding medication [12]. It has also been observed that pharmacist is trying to perform their duties with dignity and honesty but in majority of cases it has been observed that parents or guardians of the children are not supporting enough in all the matter [13]. Even sometimes it has been observed that they are not even willing to understand things and this creates a communication gap between the pharmacist and the guardians of children hence ultimately effecting the therapy in some of the cases as no knowledge about the medication could possibly led to medication errors [14].

A pharmacist should be well aware of different practices that are being carried out in the premises of pharmacy [15]. Especially when it relates to patients that are children such that pharmacist should be aware of different parameters such as describing about the dosing cups and oral syringes to parents or guardians of the children, educating parents or guardian of children about the label content of the drug that is being dispensed as well as informing them what possible side effects could appear as a result of the medication [16]. If any adverse effect appears then does, he/she report that to respective authorities, continuously about his/her knowledge as well as taking part in different activities to promote optimal use of medications [17]. Also, one of the major roles that community pharmacist should take very seriously in all age group but especially in children is to report any type of adverse effects that occur due to any medication [18].

The main objective of this research is the assessment of knowledge, attitude and practise among community pharmacist when it comes to prescription pattern in children and this research is carried out in a cross-sectional study format.

2. MATERIALS AND METHODS

Students from a private medical institution in Lahore carried out the cross sectional, observational study to find out what community pharmacist knew, thought, and did about children's prescription patterns. The period of data collection was August 15,2024- August 30,2024. A total of 133 completed questionnaire were gathered; none of them were deemed incomplete or returned.

2.1 Inclusion Criteria

The study included registered pharmacists employed at community pharmacies with in tertiary of Lahore who consented to participate and complete the questionnaire.

2.2 Exclusion Criteria

The pharmacist who refuses to fill the form are excluded from this study. The community pharmacist working in pharmacies out of tertiary of Lahore are also excluded from the study.

After the inclusion and exclusion criteria, the sample size of the study remains 133. Pharmacist comprehension was assessed using a standardized questionnaire. Data was collected from the various areas of Lahore, Pakistan. Pharmacists who agreed to participate were given the questionnaire, and all data collection was overseen by a senior pharmacist. Data was collected through stratified convenient sampling technique.

The questionnaire comprises of multiple type of sections, starting with a consent form which outlines the study objectives, introduction, process and confidentiality. There were forty questions on the survey, broken down into various areas. The first component gathered demographic information such as name, age, gender, year of experience, higher education, average weekly hours worked, and workplace location. The second component consisted of a series of questions with correct answers to gauge the pharmacist knowledge and level of understanding of children's prescription patterns.

Some knowledge based questions that were listed in questionnaire includes; most common method for calculating pediatric medication dose, first line of treatment for bacterial infections in children, critical considerations when prescribing medications for children compared to adult, primary concerns when using OTC cough and cold medications in children, importance of liquid dosage form in children, common side effects of antibiotics in children, common considerations while dispensing medications to children, measures adopted to ensure safe use of non-prescription drugs in children and prohibition of use of aspirin in children. A pharmacist was deemed to have sufficient knowledge if they could answer the question with 55% accuracy. Ten questions concerning pharmacist attitudes towards children's prescription patterns were

included in the third segment. In the fourth segment, a series of yes/no questions was utilized to evaluate pharmacist practice with reference to children's prescription patterns.

2.3 Statistical Analysis

We applied the 24th edition of SPSS to analyze the data that had been gathered, and we used the mean and Standard deviation (SD) to summarize the results. Kurtosis and Skewness Tests were used to see if the data had a normal distribution. One-way ANOVA tests or Independent T tests were used to evaluate the null hypothesis. Either the chi square test or Fischer's exact test were used to examine categorical data. The effect size was calculated

using either phi (ϕ) or Cramer's V. A P-value was deemed significant if it was less than 0.05.

3. RESULTS

A total of 133 pharmacists participated in the current investigation. In comparison to the ratio of male pharmacists, female pharmacists accounted for 24.1% of the total and male pharmacists accounted for 75.9%. Furthermore, just 27.1% of pharmacists hold a certification with a specialty, compared to 69.9% of pharmacists who merely hold a degree. The majority of pharmacists, 76.7% have less than 15 years of experience. Table 1 provides more demographic information about the pharmacists.

Table 1. Represents the demographic information of the pharmacist. (N=133)

Age	
<30 years	89(66.9)
30-50 years	39(29.3)
>50 years	5(3.8)
Gender	
Male	101(75.9)
Female	32(24.1)
Higher education	
MPHIL	33(24.8)
Ph.D.	7(5.3)
Graduate	93(69.9)
Year of graduation	
Recently graduated	13(9.8)
<15 years	102(76.7)
>15 years	6(4.5)
Not given	12(9.0)
Any specialization / Certification	
Yes	36(27.1)
No	97(72.9)
Years of experience	
<5 years	84(63.2)
5-10 years	29(21.8)
>10 years	19(14.3)
Average number of working hours per week	
10-30	8(6.0)
30-60	102(76.7)
60-90	21(15.8)
>90	2(1.5)
Location of work place	
Urban	131(98.5)
Rural	2(1.5)
How proficient are you with using technology in your daily work	
Proficient	89(66.9)
Very proficient	36(27.1)
Somewhat proficient	8(6.0)
Not proficient	-

To ascertain the knowledge levels of 133 pharmacists, a post-hoc pairwise comparison of the chi square test for various factors with pharmacist knowledge was conducted. According to the research, 43.8% of females had significantly adequate knowledge which was higher as compared to males 15.8%. Table 2 provides more information on pharmacists' understanding of children's prescription patterns.

The P value was calculated using chi square Test as the data was parametric. Table 2 demonstrates that there is no significant

difference ($p>0.05$) between age, years of experience, years of graduation, specialization/certification, years of experience, average number of working hours per week, and use of technology.

Table 3 demonstrates that there are no significant differences ($p>0.05$) between age, gender, higher education, year of graduation, year of experience, average number of working hours per week, location of work place and use of technology, on the community pharmacists perspective on children's prescription patterns.

Table 2. Knowledge of pharmacists

Variables	Adequate knowledge	Inadequate knowledge	P-value	Effect size(ϕ)
Age				
<30 years	21(23.6)	68(76.4)	0.468	-
30-50 years	9(23.1)	30(76.9)		
>50 years	0(0.0)	5(100.0)		
Gender				
Male	16(15.8)	85(84.2)	<0.001	0.002
Female	14(43.8)	18(56.3)		
Higher education				
MPHIL	8(24.2)	25(75.8)	0.879	-
Ph.D.	2(28.6)	5(71.4)		
Graduate	20(21.5)	73(78.5)		
Year of graduation				
Recently graduated	2(15.4)	11(84.6)	0.061	-
<15 years	22(21.6)	80(78.4)		
>15 years	0(0.0)	6(100.0)		
Not given	6(50.0)	6(50.0)		
Any specialization / Certification				
Yes	9(25.0)	27(75.0)	0.681	-
No	21(21.6)	76(78.4)		
Years of experience				
<5 years	20(23.8)	64(76.2)	0.501	-
5-10 years	8(27.6)	21(72.4)		
>10 years	2(10.5)	17(89.5)		
Average number of working hours per week				
10-30	4(50.0)	4(50.0)	0.106	-
30-60	24(23.5)	78(76.5)		
60-90	2(9.5)	19(90.5)		
>90	0(0.0)	2(100.0)		
Location of work place				
Urban	28(21.4)	103(78.6)	0.008	0.050
Rural	2(100.0)	0(0.0)		
How proficient are you with using technology in your daily work				
Proficient	20(22.5)	69(77.5)	0.985	-
Very proficient	8(22.2)	28(77.8)		
Somewhat proficient	2(25.0)	6(75.0)		
Not proficient	-	-		

Table 3. Attitude of pharmacist

Outcomes	Mean (SD)	95%Confidence interval(C.I)		T statistics(df)	p-value	Effect size(ϕ)
Variable		Lower bounds	Upper bounds			
Age						
<30 years	0.8090±0.95	0.6277	1.0232	1.756 (1,132)	0.177	
30-50 years	0.7436±0.96	0.4694	1.0432			
>50 years	0.0000±0.00	0.0000	0.0000			
Gender						
Male	0.6733±0.91	0.5052	0.8597	3.542 (1,132)	0.062	
Female	1.0313±0.99	0.7059	1.3571			
Higher education						
MPHIL	0.9394±0.99	0.6177	1.2682	1.174 (1,132)	0.312	
Ph.D.	1.0000±1.00	0.2000	1.7500			
Graduate	0.6774±0.92	0.4945	0.8667			
Year of graduation						
Recently graduated	0.5385±0.87	0.1252	1.0000	2.087 (1,132)	0.105	
<15 years	0.7941±0.95	0.6139	0.9806			
>15 years	0.0000±0.00	0.0000	0.0000			
Not given	1.0833±0.99	0.5385	1.6364			
Any specialization / Certification						
Yes	1.0278±0.99	0.6970	1.3945	4.059 (1,132)	0.046	
No	0.6598±0.91	0.4950	0.8315			
Years of experience						
<5 years	0.8929±0.96	0.6942	1.0885	1.821 (1,132)	0.147	
5-10 years	0.6207±0.90	0.3001	0.9599			
>10 years	0.4211±0.83	0.0952	0.8235			
Average number of working hours per week						
10-30	0.2500±0.70	0.0000	0.8571	1.492 (1,132)	0.220	
30-60	0.8333±0.97	0.6567	1.0206			
60-90	0.6667±0.85	0.3203	1.0526			
>90	0.0000±0.00	0.0000	0.0000			
Location of work place						
Urban	0.7557±0.94	0.6000	0.9084	0.130 (1,132)	0.719	
Rural	1.0000±1.41	0.0000	2.0000			
How proficient are you with using technology in your daily work						
Proficient	0.6292±0.89	0.4659	0.8072	2.609 (1,132)	0.077	
Very proficient	1.0278±0.99	0.6844	1.3333			
Somewhat proficient	1.0000±1.06	0.2509	1.7143			
Not proficient	-	-	-			

Table 4 presents a summary of the factors that do not significantly differ ($p>0.05$) based on age, gender, higher education, year of graduation, experience, specialization/certification, average number of working hours per week, and location of work place about community pharmacists' practices with reference to children's prescription patterns.

4. DISCUSSION

The current research assesses knowledge of community pharmacists, evaluate attitude, and practice regarding prescription patterns in pediatric patients. This study involve the total of 133 pharmacists with fewer females as compared to males.

Although the majority of pharmacists were familiar with the concept of pediatric prescription most admitted to having gain their knowledge through experience as reported by [6]. Furthermore, inadequate knowledge of males was more as compared to the females and the percentage is 84.2% get the P value < 0.001.

Additionally, no significant differences were found in attitude of pharmacists based on age, gender, higher education, year of graduation, years of experience, average number of working hours per week, location of workplace, or use of technology. 517 pharmacists in Nigeria participated in a survey that found that their knowledge and attitude are suboptimal [19].

Table 4. Practice of pharmacist

Outcomes	Mean (SD)	95%Confidence interval(C.I)		T statistics(df)	p-value	Effect size(ϕ)
Variable		Lower bounds	Upper bounds			
Age						
<30 years	17.5506±3.52	16.8297	18.2527	0.240 (1,132)	0.787	-
30-50 years	17.4615±3.45	16.4146	18.5308			
>50 years	18.6000±2.07	16.5000	20.4173			
Gender						
Male	17.6238±3.56	16.9714	18.3050	0.125(1,132)	0.724	-
Female	17.3750±3.09	16.2965	18.5448			
Higher education						
MPHIL	16.8182±3.53	15.5718	18.0696	1.168 (1,132)	0.314	-
Ph.D.	17.1429±4.25	13.6667	20.3344			
Graduate	17.8602±3.35	17.1291	18.5199			
Year of graduation						
Recently graduated	18.3846±3.45	16.4286	20.2120	0.766 (1,132)	0.515	-
<15 years	17.6176±3.42	16.9451	18.2997			
>15 years	17.3333±3.93	13.5000	20.3321			
Not given	16.3333±3.52	14.1003	18.2491			
Any specialization / Certification						
Yes	16.8056±3.63	15.6563	17.9143	2.408 (1,132)	0.123	-
No	17.8454±3.35	17.1432	18.5150			
Years of experience						
<5 years	17.4524±3.46	16.7447	18.1706	0.396 (1,132)	0.756	-
5-10 years	17.5862±3.41	16.3215	18.8077			
>10 years	18.1579±3.59	16.4546	19.6470			
Average number of working hours per week						
10-30	17.1250±5.16	13.5000	20.8000	0.245 (1,132)	0.865	-
30-60	17.4804±3.38	16.8191	18.1212			
60-90	18.0476±3.26	16.6542	19.3681			
>90	18.5000±2.12	17.0000	20.0000			
Location of work place						
Urban	17.6031±3.45	17.0076	18.1753	1.121 (1,132)	0.292	-
Rural	15.0000±2.82	13.0000	17.0000			
How proficient are you with using technology in your daily work						
Proficient	18.2022±3.03	17.5761	18.8143	6.090 (1,132)	0.003	
Very proficient	15.9167±3.86	14.5714	17.2618			
Somewhat proficient	17.8750±3.83	15.3333	20.6992			
Not proficient	-	-	-			

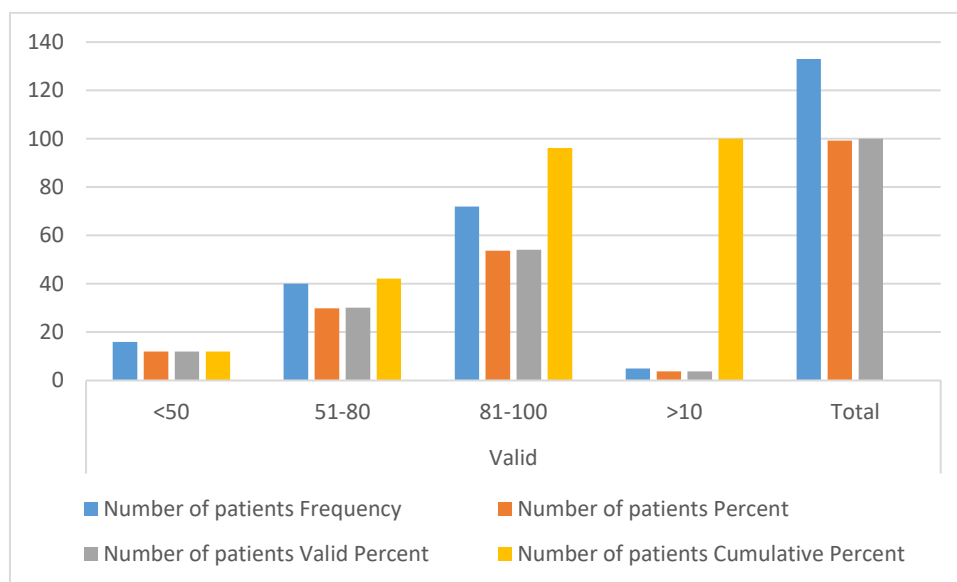


Fig. 1. The mean of the number of patients in a pharmacy per day

A statistically non-significant association was reported in age with P value of (0.468), which shows that age does not have any effect on better knowledge of community pharmacists regarding the children prescription pattern and the grand findings of this study are quite different from the others studies which was conducted in 2018 by dove medical press according to which the age can significantly affect the knowledge of pharmacists regarding the disease [20].

The present study shows that gender have no statistically significant impact (P value <0.001) on the knowledge of community pharmacists. The present study is well supported with a previous study conducted in Malaysia which proves the similar kind of findings [21].

The study also indicates that the presence of higher education such as MPHIL, Ph.D., graduate does not have a statistically significant effect on the knowledge of community pharmacists this suggests that whether or not pharmacists have this higher education, their knowledge about remain unaffected. The findings of the current study are supported by a study conducted in Malaysia, which reported similar results regarding the knowledge of pharmacists [22].

Similarly, the study indicates a non-statistically significant effect of year of graduation (P value 0.061) on the use and knowledge of pharmacists among all respondents. These findings are consistent with various studies conducted in

different countries, like one conducted in 2018, about knowledge and practice of pharmacists toward antimicrobial stewardship in Pakistan [23].

The results from current study, show that there is no significant association between any specialization and certification and knowledge of pharmacists regarding prescription patterns as their p-value is 0.681. The study was conducted in 2021 which professed that the p-value of specialization and certification has no significant association [24].

When data was analyzed to find any kind of association between years of experience and knowledge of pharmacists, we found no significant association because the p-value was 0.501. As previously conducted study, in Lusaka, Zambia [25].

The current study proved that when the question was asked from the respondents what are their working hours per week the answer was not statistically significant as the P value is (0.106). A similar study that was conducted in 2019 in Malaysia, results from that study showed that there is no significant association between working hours and knowledge of pharmacists [26].

Furthermore, this study revealed that location of work place might not be effective on the knowledge of pharmacists regarding the prescription patterns as the P value is (0.008) while as a study was conducted in 2008 [27].

When the question was asked from the respondents how proficient are you with using technology in your daily work the answer is not statistically significant as the P value (0.985). A similar kind of study held in 2018 in China [28].

Findings of this study shows that there is no significant association between age (≤ 30 , 30-50, ≥ 50) and the attitude of pharmacists regarding prescription pattern in children as the p-value is 0.177 which is greater than 0.05 so the attitude of the pharmacist is not effected by this and it is due to fact that attitude of pharmacist is shaped by different parameter such as ethics, professional training, workplace culture not age. The finding of this study does not match with the study conducted in Spain in 2020 which shows that age is significant with attitude of pharmacist that is contradictory of our study [29]. There is no significant associations between gender (male and female) with the attitude of pharmacists regarding prescription pattern in children as the p-value is 0.062 which is greater than 0.05 that means the attitude of the pharmacist is not effected by this factor and the reason for this is that the pharmacist whether male or female undergo vigorous training which instils professional standard and ethics therefore gender has no link with attitude of a community pharmacist the result of our study shows that our study is contradictory of study performed in Spain in 2020 in which there is significant association between gender and the attitude of the pharmacist [29].

According to the study under consideration there is no significance associations between higher education (MPIL , PhD , graduation) and the attitude of pharmacists regarding prescription pattern in children as the p-value is 0.312 which is greater than 0.05 so the attitude of the pharmacist is not effected by the higher studies like MPhil and PhD and they may not influence the attitude of a community pharmacists as their day to day task are mainly based on patient care, medication dispensing as well as counselling that depends on practical skills rather than academic research. The result of our study refutes with study performed in Spain in 2020 according to which education level is significant to the attitude of the pharmacists [29]. There is no significant associations between year of graduation (recently graduated, less than (≤ 15 , ≥ 15 , not given) and the attitude of pharmacists regarding prescription pattern in children as the p-value is 0.105 which is greater than 0.05 so the attitude of the pharmacist should not be effected by the

year of graduation as year of graduation may not strongly be associated with the attitude of a community pharmacist as professional attitudes are shaped more by factors such as ongoing experience, workplace as well as ethical standards. The result of our study is contradictory to study performed in Riyadh region of Saudi Arabia in 2009 according to which there is significant association between years of graduation and attitude of a community pharmacist [30].

Our current study shows that there is a significant association between any specialization/certification (yes, no) and the attitude of pharmacists regarding prescription pattern in children as the p-value is 0.046 which is greater than 0.05 so the attitude of a community pharmacist majorly depends on it as any sort of specialization or certification can often lead to increased knowledge, confidence and expertise. The result of our studies also matches with the study performed in Cairo in 2022 and according to that study also there is a significant association between specialization or certification with the attitude of a community pharmacist [31]. Our study shows that there is no significant associations between year of experience (less than 5, 5-10, more than 10) and the attitude of pharmacists regarding prescription pattern in children as the p-value is 0.147 which is greater than 0.05 so the attitude of the pharmacist is not effected by this and this is due to the fact that there are professional standards and ethical guidelines that governs a pharmacist behavior regardless of the experience. Result of our study is in contradiction with the result of study conducted in Shanghai in 2024 according to that study there is a significant association between years of experience and attitude of a community pharmacist [32].

With respect to our study it has been shown that there is no significant associations between avg. no. of working hours per week (10-30, 30-60, 60-90, ≥ 90) and the attitude of pharmacists regarding prescription pattern in children as the p-value is 0.220 which is greater than 0.05 so the attitude of the pharmacist will not be effected by this as the pharmacist who work more gain greater practical experience, more patient interaction as a result of which there is an enhanced competence of pharmacist and more patient centered approach. Results of our study does not match with the study that was performed in Turkey in 2011 and according to that study there is a significant association

between avg. no. of working hours per week with the attitude of the pharmacist [33]. Considering our study it shows that there is no significant associations between location of working place (urban, rural) and the attitude of pharmacists regarding prescription pattern in children as the p-value is 0.719 which is greater than 0.05 so the attitude of the pharmacist should not be affected by this parameter as the urban pharmacist encounter more diverse patients population enhancing their abilities and patient centered attitudes where as a rural pharmacist may build closer relationship with a consistent patient base the result of our study shows that it does relate to study performed in Spain in 2020 according to which according to which there is no significant association between location of working place to his or her attitude [29].

According to current study it has been shown that there is no significance associations between how proficient are you with using technology in your daily work (proficient, very proficient, somewhat proficient, not proficient) and the attitude of pharmacists regarding prescription pattern in children as the p-value is 0.077 which is greater than 0.05 so the attitude of the pharmacist is not affected by this as a proficient pharmacists can work more efficiently, leading to greater job satisfaction and a positive attitude. According to study conducted in Egypt in 2024 there is a significant association between proficiency in using technology and attitude of pharmacist and this is contradicted to our study [34].

The current study shows that the age of people <30 years have non-significant practice with a p-value of 0.787 because they have limited experience and with the advancing age >50 it might be due to different physical and mental health problems. The gender, higher education, year of graduation, any specialization/certification, years of experience, average numbers of working hours per week, location of work place shows that there is no significant association between these variables and the practice of pharmacists. As the p-value is >0.05. Similar study conducted in Pakistan in 2024 which is in contrast with our current findings [35].

The pharmacist is proficient with using technology in daily work. As current findings show the significant relationship between practice of pharmacist and use of technology with a p-value of 0.003. Similar research

conducted in Pakistan in 2024 which show no association with our findings [36].

5. CONCLUSION

In conclusion, knowledge, attitudes and practices (KAP) regarding prescribing patterns of community pharmacists in Lahore, Pakistan, reveal strengths and areas for improvement. Though pharmacists have a strong understanding of medication management and a positive attitude towards their role in patient care, gaps remain in their knowledge of modern treatment protocols and drug interactions. Moreover, despite the observation of sound prescribing practices, inconsistent adherence to the recommendations indicates the need for closer collaboration with healthcare providers.

To optimize prescribing patterns and improve patient safety, it is important to implement targeted educational initiatives and develop a culture of continuous learning among community pharmacists. Ultimately, this contributes to the best health care and public health in the region.

6. LIMITATIONS

Research on the attitudes, practices, and expertise of retail pharmacists in Lahore about prescription trends in children may also run into a number of limitations. If the pharmacists who were surveyed no longer accurately represent the general community, sample size and representativeness may have an impact on the validity of the results. Response bias is a problem as pharmacists may provide socially acceptable advice. Pharmacists might respond inconsistently due to differences in their education and experience. Pharmacists' expertise and actions may differ depending on the most recent data on prescription patterns in children. Cultural and religious differences might affect the results, making them less generalizable to other areas.

In addition to other factors such as workload and useful resource availability can affect pharmacist's capability to update themselves of the latest trends.

DISCLAIMER (ARTIFICIAL INTELLIGENCE)

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc.) and text-to-image generators have been used during the writing or editing of this manuscript.

CONSENT

As per international standards or university standards, Participants' written consent has been collected and preserved by the author(s).

ETHICAL APPROVAL

It is not applicable.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Bush PJ, Hardon AP. Towards rational medicine use: Is there a role for children? *Soc Sci Med.* 1990;31(9):1043–50.
2. Benavides S, Huynh D, Morgan J, Briars L. Approach to the Pediatric Prescription in a Community Pharmacy. *J Pediatr Pharmacol Ther.* 2011;16(4):298–307.
3. Steinhausen HC. Recent international trends in psychotropic medication prescriptions for children and adolescents. *Eur Child Adolesc Psychiatry.* 2015;24(6):635–40.
4. Nilaward W, Mason HL, Newton GD. Community pharmacist-child medication communication: Magnitude, influences, and content. *J Am Pharm Assoc.* 2005;45(3):354–62. Available:<http://dx.doi.org/10.1331/1544345054003778>
5. Carpenter DM, Abraham O, Alexander DS, Horowitz K. Counseling of children and adolescents in community pharmacies: Results from a 14-day observational study. *J Am Pharm Assoc.* 2016;56(3):266–269.e1. Available:<http://dx.doi.org/10.1016/j.japh.2016.03.001>
6. Stewart D, Rouf A, Snaith A, Elliott K, Helms PJ, McLay JS. Attitudes and experiences of community pharmacists towards paediatric off-label prescribing: A prospective survey. *Br J Clin Pharmacol.* 2007;64(1):90–5.
7. Drankowska J, Krysiński J, Płaczek J, Czerw A, Religioni U, Merks P. Evaluation of the prescribing patterns of paediatric medications in polish community pharmacies. *Acta Pol Pharm - Drug Res.* 2021;78(2):279–87.
8. Keewan N, Al-Sawalha NA, Almomani BA. The knowledge of community pharmacists about appropriate dosing of antibiotics among paediatrics: A national study from Jordan. *Int J Clin Pract.* 2021;75(11):1–7.
9. Emeka PM, Al-Omar MJ, Khan TM. A qualitative study exploring role of community pharmacy in the irrational use and purchase of nonprescription antibiotics in Al Ahsa. *Eur J Gen Med.* 2012;9(4):230–4.
10. Sabry NA, Farid SF, Dawoud DM. Antibiotic dispensing in Egyptian community pharmacies: An observational study. *Res Soc Adm Pharm.* 2014;10(1):168–84. Available:<http://dx.doi.org/10.1016/j.sapharm.2013.03.004>
11. Doucette WR, Kreling DH, Schommer JC, Gaither CA, Mott DA, Pedersen CA. Evaluation of community pharmacy service mix: Evidence from the 2004 National Pharmacist Workforce Study. *J Am Pharm Assoc.* 2006;46(3):348–55. Available:<http://dx.doi.org/10.1331/154434506777069471>
12. Dundee FD, Dundee DM, Noday DM. Pediatric counseling and medication management services: opportunities for community pharmacists. *J Am Pharm Assoc (Wash).* 2002;42(4):556–67. Available:<http://dx.doi.org/10.1331/108658002763029526>
13. Zyoud SH, Shtaya RM, Hamadneh DQ, Sawalmeh SN, Khadrah HA, Zedat RR, et al. Parental knowledge, attitudes, and practices towards self-medication for their children: A cross-sectional study from Palestine. *Asia Pac Fam Med.* 2020;18(1).
14. El Hajj MS, Mekkawi R, Elkaffash R, Saleh R, El Awaisi A, Wilbur K. Public attitudes towards community pharmacy in Arabic speaking Middle Eastern countries: A systematic review. *Res Soc Adm Pharm.* 2021;17(8):1373–95. Available:<https://doi.org/10.1016/j.sapharm.2020.11.013>
15. Sharma H, Jindal D, Aqil M, Alam M, Karim S, Kapur P. A survey for assessment of the role of pharmacist in community pharmacy services. *J Pharm Bioallied Sci.* 2009;1(1):23.
16. Abraham O, Brothers A, Alexander DS, Carpenter DM. Pediatric medication use experiences and patient counseling in community pharmacies: Perspectives of

- children and parents. *J Am Pharm Assoc.* 2017;57(1):38-46.e2.
Available:<http://dx.doi.org/10.1016/j.japh.2016.08.019>
17. Herman MJ, Susyanty AL. An Analysis of Pharmacy Services by Pharmacist in Community Pharmacy (Kajian Praktek Kefarmasian oleh Apoteker di Apotek Komunitas). *Bul Penelit Sist Kesehat.* 2012;15(3):271–81.
Available: <http://aptfi.or.id/?p=15>,
 18. Mahmoud MA, Alswaida Y, Alshammari T, Khan TM, Alrasheedy A, Hassali MA, et al. Community pharmacists' knowledge, behaviors and experiences about adverse drug reaction reporting in Saudi Arabia. *Saudi Pharm J.* 2014;22(5):411–8.
Available:<http://dx.doi.org/10.1016/j.jsps.2013.07.005>
 19. Ogunyinka I, Yusuff K, Erah PO, Oshikoya K, Faponle F, Ungo-Kore H. Community pharmacists' knowledge and attitudes towards pediatric pain management in Nigeria. *Risk Manag Healthc Policy.* 2021;14:4595–607.
 20. Sarwar MR, Saqib A, Iftikhar S, Sadiq T. Knowledge of community pharmacists about antibiotics, and their perceptions and practices regarding antimicrobial stewardship: A cross-sectional study in Punjab, Pakistan. *Infect Drug Resist.* 2018; 11:133–45.
 21. Akbar Z, Saleem Z, Shaukat A, Farrukh MJ. Perception and practices of community pharmacists towards antimicrobial stewardship in Lahore, Pakistan. *J Glob Antimicrob Resist.* 2021;25:157–61.
Available:<https://doi.org/10.1016/j.jgar.2021.03.013>
 22. Hussain R, Hassali MA, Hashmi F, Farooqui M. A qualitative exploration of knowledge, attitudes and practices of hospital pharmacists towards adverse drug reaction reporting system in Lahore, Pakistan. *J Pharm Policy Pract.* 2018; 11(1).
 23. Akbar Z, Saleem Z, Shaukat A, Farrukh MJ. Perception and practices of community pharmacists towards antimicrobial stewardship in Lahore, Pakistan. *J Glob Antimicrob Resist.* 2021;25:157–61.
 24. Muhammad K, Saqlain M, Muhammad G, Hamdard A, Naveed M, Butt MH. Knowledge, Attitude, and Practices (KAPs) of community pharmacists regarding COVID-19: A Cross-Sectional Survey in 2 Provinces of Pakistan. *Disaster Med Public Health Prep.* 2022;16(5):1864–72.
 25. Mudenda S, Hankombo M, Saleem Z, Sadiq MJ, Banda M, Munkombwe D. Knowledge, attitude, and practices of community pharmacists on antibiotic resistance and antimicrobial stewardship in Lusaka, Zambia. *J Biomed Res Environ Sci.* 2021;2(10):1005–14.
 26. Balan S, Ahmad Hassali MA, Mak VSL. Attitudes, knowledge and views on off-label prescribing in children among healthcare professionals in Malaysia. *Int J Clin Pharm.* 2019;41(4): 1074–84.
 27. Vishwanath A, Brodsky L, Shaha S, Leonard M, Cimino M. Patterns and changes in prescriber attitudes toward PDA prescription-assistive technology. *Int J Med Inform.* 2009;78(5):330–9.
 28. Chang J, Lv B, Zhu S, Yu J, Zhang Y, Ye D. Non-prescription use of antibiotics among children in urban China: a cross-sectional survey of knowledge, attitudes, and practices. *Expert Rev Anti Infect Ther.* 2018;16(2):163–72.
 29. Plaza-Zamora J, Legaz I, Osuna E, Pérez-Cárceles MD. Age and education as factors associated with medication literacy: a community pharmacy perspective. *BMC Geriatr.* 2020;20(1):1–11.
 30. Al-Arifi MN. Pharmacy students' attitudes toward pharmaceutical care in Riyadh region Saudi Arabia. *Pharm World Sci.* 2009;31(6):677–81.
 31. Mohamed Ibrahim OH. Assessment of Egyptian pharmacists' attitude, behaviors, and preferences related to continuing education. *Int J Clin Pharm.* 2012;34(2): 358–63.
 32. Zhang X, Tang Z, Zhang Y, Tong WK, Xia Q, Han B. Knowledge, attitudes, and practices of primary healthcare practitioners regarding pharmacist clinics: a cross-sectional study in Shanghai. *BMC Health Serv Res.* 2024;24(1):1–11.
 33. Calgan Z, Aslan D, Yegenoglu S. Community pharmacists' burnout levels and related factors: An example from Turkey. *Int J Clin Pharm.* 2011;33(1):92–100.
 34. Hasan HE, Jaber D, Tabbah S Al, Lawand N, Habib HA, Farahat NM. Knowledge, attitude and practice among pharmacy students and faculty members towards artificial intelligence in pharmacy practice:

- A multinational cross-sectional study. Plos One. 2024;19(3 March):1–24. Available:<http://dx.doi.org/10.1371/journal.pone.0296884>
35. Nabeel M, Ali K, Sarwar MR, Waheed I. Assessment of knowledge, attitudes, and practices among community pharmacists in Lahore regarding antibiotic dispensing without prescription: A cross-sectional study. PLoS One. 2024;19(6June):1–14. Available:<http://dx.doi.org/10.1371/journal.pone.0304361>
36. Javed E, Malik A, Iqbal S, Mustafa E, Amjad A, Amir S, et al. Evaluation of Knowledge, Attitude, and Practice of Community Pharmacists in Managing Chronic Diseases in Lahore, Pakistan. J Pharm Res Int. 2024;36(9):68–80.

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