Evaluation of Knowledge, Attitude, and Practice of Community Pharmacists in Managing Chronic Diseases in Lahore, Pakistan

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Authors' contributions

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

Original Research Article

ABSTRACT

Background: The rising number of chronic illnesses such as asthma, diabetes, osteoarthritis, hypertension, and chronic kidney disease (CKD) presents a major danger to the worldwide health community. The ability of individuals to successfully manage their medical problems with the help of healthcare professionals is essential to the effective control of chronic illnesses.

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Objective: The current study focuses to evaluate the knowledge of community pharmacist's regarding chronic disease management, their attitude, and their practice to control chronic diseases.

Methods: A cross-sectional survey-based study was conducted using random sampling method in Lahore, Pakistan. The samples collected for this study was 110. However, the final sample size was 93, the remaining forms were discarded. Data was collected by visiting community pharmacies in Lahore. The filled questionnaires were analyzed by using Statistical Package for Social Sciences program software (SPSS Inc., version 21.0, IBM corp., Armonk NY, USA). P-value of less than 0.05 were considered as statistically significant values.

Results: The results, with a p value of 0.001, indicate a significant difference in adequacy of knowledge between the male and female groups. Majority of the participants have bachelor's education and are unmarried. The p-value of 0.871 for level of education shows insignificant association between the higher education and better practice scores. The most important finding in this study is significant relationship between technology proficiency and adequacy of knowledge with p-value of 0.005. This shows that those who are more proficient in the technology are significantly more likely to have adequate knowledge.

Conclusion: This study concludes that the majority of community pharmacists had adequate knowledge regarding chronic disease management. But showed neutral attitude and fair practice towards the control of chronic diseases. In order to optimize the management of chronic diseases, community pharmacists need to exhibit best practices and a positive attitude.

1. INTRODUCTION

The global health community is seriously threatened by the rising prevalence of chronic diseases such as Asthma, Diabetes, Osteoarthritis, Hypertension, and chronic kidney disease (CKD) [1]. According to the 2019 Global Burden of Disease research, Chronic conditions like diabetes and hypertension are among the top five global death hazards, causing almost 20 and 10% of all deaths worldwide, respectively [2]. The ability of people to effectively manage their medical conditions with the assistance of healthcare practitioners is a key factor in the successful control of chronic diseases [3] Clinical pharmacists (CPs) are particularly interested in strategies for managing chronic diseases because most medical interventions involve prescription pharmaceutical use. Because of their expertise with drugs, frequent patient interactions, and convenient location, community pharmacists are in a unique position to assist patients in managing their chronic illnesses [4].

Since prescription medications are used in 80% of medical treatments, interventions conducted by pharmacists are particularly relevant when it comes to managing chronic diseases [5]. Pharmacists typically advise their patients verbally or in writing about how to take prescribed medications and dietary supplements correctly, as well as about any potential side effects, safety measures, and how to store them

[6]. Pharmacists can contribute to chronic disease management in different ways, including the disease state education, patient counseling, glucose level measurement, blood pressure measurement, adherence monitoring, and medication therapy [7]. A randomized controlled clinical trial showed that a structured evidence-based pharmacist-delivered chronic disease management service significantly enhanced patients' medication uses and quality of life [8].

Patients receiving inadequate hypertension care could be one of the potential causes of poor hypertension control. It was found that those with better blood pressure control were more likely to receive optimal hypertensive therapy [9]. Community pharmacists educate patients on hypertension management, monitor elevated blood pressure, and refer those not meeting targets to general practitioners [4].

Diabetes type 2 is a serious public health issue. Diabetes-related expenses exceeded 237 billion dollars in direct costs and 90 billion dollars in indirect costs in 2017 [10]. A substantial amount of research demonstrates the advantages of multidisciplinary teams as a successful diabetes care approach in terms of lowering medical errors and enhancing patient and overall healthcare outcomes. By delivering patient-centered care in accordance with the pharmaceutical care philosophy, the pharmacist has been acknowledged as a crucial component

of diabetes care teams [11]. Community Pharmacists manage diabetes patients, providing education on treatment, anti-diabetes medications, lifestyle changes, insulin administration, and self-blood glucose monitoring [4].

Community pharmacists play a vital role in the healthcare system in Malaysia and provide accessible healthcare services to improve the health outcomes to mainstream hospitals and primary healthcare services [12]. Pharmacists are the trusted healthcare professionals widely distributed across territories, reaching people with lower access to care and providing different types of services, encompassing screening, management [13]. Asthma is more common than any other chronic respiratory disease in low and middle-income nations. It is a major cause of death and disability in all age and gender categories, although it is most prevalent in children [14]. Pharmaceutical care is the provision of drug therapy for achieving definite outcomes with improvement in patient's quality of life. It is important for pharmacists to provide disease-oriented pharmaceutical care [15].

Community pharmacists plays important role in increasing vaccinations rates especially in countries where they offer vaccination administration [16]. Their role includes medication therapy management (MTM), promoting patient adherence, engaging in collaborative care to improve health outcomes. Regardless these opportunities, pharmacists face many challenges mainly in developing countries [8]. Some challenges include evidence-based medical information provision, managing supply chains, prevention of infection, preventing stock-piling. However, some chronic disease like hypertension, asthma, diabetes can affect the mental and physical condition of patient [17].

The aim of this study was therefore to summarize and evaluate quantitative and qualitative evidence of chronic disease management in community pharmacy. The interventions of this study are to identify the chronic diseases management in community pharmacy setting namely; hypertension, diabetes mellitus (DM) and asthma. The results would provide knowledge and information of community pharmacists when planning services for chronic disease.

2. METHODOLOGY

A cross-sectional survey-based study was conducted to evaluate the attitude, knowledge and practice of community pharmacist on hypertension, asthma and diabetes. Quantitative research methodology involving validated questionnaires and research tools were utilized in order to evaluate the knowledge attitude and perception of healthcare providers.

The data for this research project was collected from community pharmacists Lahore, Punjab, Pakistan. Study settings were based in Lahore. The purpose of study was to evaluate the knowledge of healthcare students in Lahore. To achieve this goal, the data was collected from community pharmacies that dealt with healthcare professionals. The study was conducted on community pharmacists from different pharmacies in Lahore, Punjab Pakistan. The duration of research was of 3 months approximately, from June 2024 to August 2024.

The inclusion criteria for this research are as follows:

- Only the community pharmacist was included.
- Those participants who provided consent to voluntarily participation in this study were included.

The exclusion criteria for this research are as follows:

- Hospital pharmacists were excluded.
- Dentists, physiotherapists, physicians and undergraduate students (future healthcare providers) were excluded.

Based on assumptions, the sample size was considered to be not less than 90. The samples collected for this study was 110. However, the final sample size was 93 the remaining forms were discarded because of the following reasons: duplication, lack of signature, incomplete form. Data was collected by visiting community pharmacies in Lahore. The pharmacists present on community pharmacies were requested to fill the questionnaire and they must sign a consent form before filling out the questionnaire.

The data collection form was developed from the literatures regarding the pharmacists' work experiences and attitude towards pharmaceutical

care services in Pakistan. The form is developed in English language and consists of four sections. Section A comprised twelve questions about demographic characterization. Section B, C and D focus on Knowledge (15 questions), Attitude (15 questions) and Practice (15 questions) respectively. Since the study was done to monitor pharmacist performance, ethical approval was not considered necessary. However, before filling out the questionnaire, each participant had to sign a consent form.

2.1 Statistical Analysis

The filled questionnaires were analyzed by using Statistical Package for Social Sciences program software (SPSS Inc., version 21.0, IBM corp., Armonk NY, USA). Descriptive and inferential statistics were applied to summarize outcome variables, categorical variables were presented as percentages and frequencies, and quantitative variables were demonstrated as mean and standard deviations. Chi-square analysis was used to identify factors, p-values were determined when the assumptions of the chi square analysis requirements were not satisfied. P-value of less than 0.05 were considered as statistically significant values.

3. RESULTS AND DISCUSSION

Data was collected from 93 different pharmacists in Lahore, Punjab in the current study. About 54.8% females participated in the current study and 45.2% males participated. Females have higher rate of participation as compared to males. Majority of the participants have bachelor's education and are married. Most of the participants are full time employee with average 48 work hours per week. Furthermore, information is given in Table 1 about the demographics.

Fig. 1 shows the mean ratio between score of knowledge and gender of participants where score is on y-axis while gender of participants on x-axis in which male shows more adequate knowledge as compared to females.

Table 1. Represents the demographic information of the candidates. (N=93)

| Variables	N%
Gender	
Male	42 (45.2)
Female	51 (54.8)
Education	
Bachelors	68 (73.1)
Masters	25 (26.9)
Marital Status	
Married	59 (63.3)
Unmarried	34 (36.6)
Age	
20-25	30(32.3)
25-30	52(55.9)
30 years and above	11(11.8)
Source of information	
Seminars	6(6.5)
Research	22(23.7)
Medical books	55(59.1)
Medical	2(2.2)
Social Media	8(8.6)
Employment Status	
Part time	11(11.8)
Full time	82(88.2)
Use of Technology	
Very Proficient	17 (18.3)
Proficient	66 (71.0)
Somewhat Proficient	7 (7.5)
Not Proficient	3 (3.2)
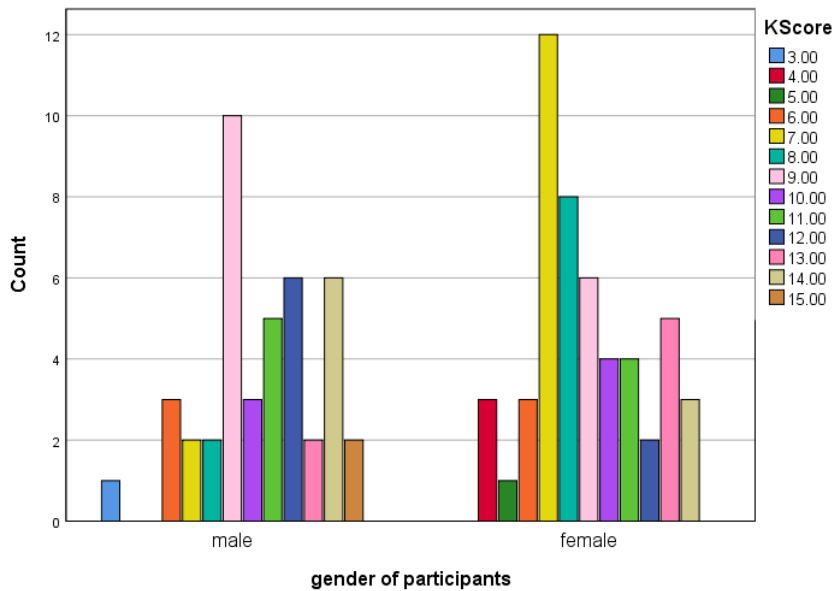
Fig. 1. The mean ratio between score of knowledge and gender of participants

In Fig. 2 division of attitude is on y-axis while gender of participants is on x-axis with the mean ratio of negative and neutral in which females have more positive attitude as compared to males.

In Fig. 3 the graph shows mean ratio between division of practice on y-axis and gender of participants on x-axis which shows that females have more good practice than males.

Males have more adequate knowledge of chronic diseases than females. Technology is used adequately and proficiently. For further information about knowledge, refer to Table 2.

In the current study results have shown that male pharmacists have more positive attitude as compared to female regarding chronic diseases. For more information related to attitude refer to Table 3 and for practice refer Table 4.
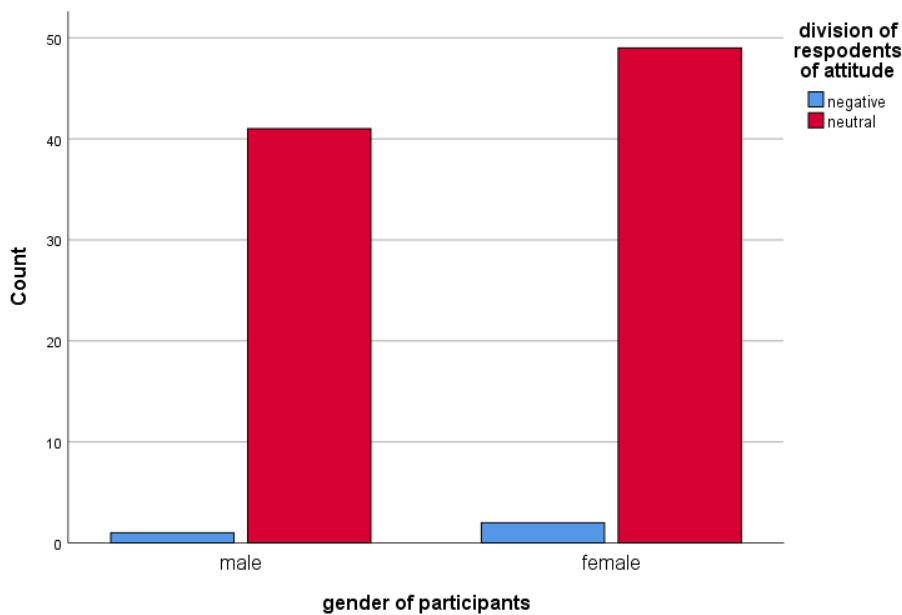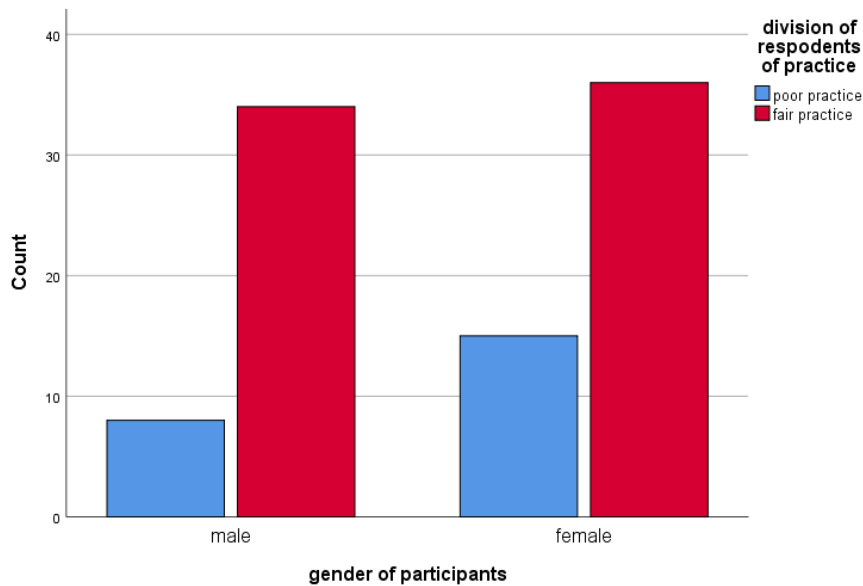

Fig. 2. Division of attitude

Fig. 3. Mean ratio between division of practice on y-axis and gender of participants on x-axis which

Table 2. Knowledge count for different variables

Variables	Adequate	Non-Adequate	*P- value*	*Effect size (φ)*
Gender				
Male	34(81.0)	8(19.0)	*<0.001*	*0.348*
Female	24(47.1)	27(52.9)		
Age				
20-25	34(81.0)	8(19.0)	*<0.002*	*0.346*
25-30	24(47.1)	27(52.9)		
Above 30	34(81.0)	8(19.0)		
Education				
Bachelors	40(58.8)	28(41.2)	*0.179*	-
Masters	18(72.0)	7(28.0)		
Marital status				
Unmarried	32(54.2)	27(45.8)	*<0.027*	*0.221*
Married	26(76.5)	8(23.5)		
Source of Information				
Seminars	4(66.7)	2(33.3)	*0.099*	-
Research	9(40.9)	13(59.1)		
Books	39(70.9)	16(29.1)		
Medical	2(100)	0(0.0)		
Social media	4(50.0)	4(50.0)		
Employment status				
Part time	8(72.7)	3(27.3)	*0.343*	-
Full time	50(61.0)	32(39.0)		
Use of technology				
Very proficient	7(41.2)	10(58.8)	*<0.005*	*0.089*
Proficient	44(55.7)	22(33.3)		
Somewhat proficient	7(100.0)	0(0.0)		
Not proficient	0(0.0)	3(100.0)		

Table 3. Attitude of Community pharmacists (Total Maximum score was 74 and minimum was 17 for 15 questions)

Outcome	Mean	95% Interval	Confidence (CI)	*t-statistics (df)*	*p-value*	*Effect size (φ)*
Variable	(SD)	Lower bounds	Upper bounds			
Gender						
Male	60.69±10.02	57.56	63.48	*0.015*	0.902	-
Female	60.43±10.11	57.32	62.87	*(1,92)*		
Age						
20-25	58.83±11.51	53.87	62.45	*0.688*	0.505	-
25-30	61,19±9.80	58.38	63.61	*(1,92)*		
Above 30	62.18±5.94	58.50	65.66			
Education						
Bachelors	60.86±10.25	58.16	63.01	*0.026*	0.871	-
Masters	60.48±10.0	56.40	63.93	*(1,92)*		
Marital status						
Unmarried	60.37±10.78	57.61	62.88	*0.238*	0.627	-
Married	61.44±9.0	57.97	64.14	*(1,92)*		
Source of information						
Seminars	64.16±5.19	59.5	67.33	*0.851*	0.497	-
Research	57.63±15.84	49.41	63.96	*(1,92)*		
Books	61.8±8.0	59.56	63.72			
Medical	60.5±7.7	55.0	66.0			
Social Media	59.75±4.65	56.33	63.0			
Employment						
Part time	64.81±6.75	60.66	68.59	*2.018*	0.159	-
Full time	60.21±10.41	57.90	62.43	*(1,92)*		
Use of technology						
Very proficient	62.47±5.01	59.76	64.68	*0.433*	0.730	-
Proficient	60.31±11.51	57.12	62.93	*(1,92)*		
Somewhat proficient	62.57±5.65	58.6	66.66			
Not Proficient	56.66±7.23	52.0	65.0			

Table 4. Practice of Community pharmacists (Total Maximum score was 40 and minimum was 15 for 15 questions)

Outcome	Mean	95% Interval	Confidence (CI)	t-statistics (df)	p-value	Effect size (φ)
Variable	(SD)	Lower bounds	Upper bounds			
Gender						
Male	23.09±4.78	21.68	24.56	*2.835*	0.096	-
Female	24.88±5.33	23.42	26.42	*(1,92)*		
Age						
20-25	23.33±5.44	21.42	25.24	*4.805*	<0.010	0.311

	Mean±SD					
25-30	25.26±4.79	24.04	26.53	*(1,92)*		
Above 30	0.45±4.05	18.00	23.0			
Education						
Bachelors	24.41±4.43	23.31	25.47	*1.083*	*0.301*	-
Masters	23.16±6.73	20.59	25.87	*(1,92)*		
Marital status						
Unmarried	24.45±5.39	23.04	25.84	*0.891*	*0.348*	-
Married	23.41±4.68	21.81	25.16	*(1,92)*		
Source of information						
Seminars	21.26±3.65	17.85	24.11	*2.18*	*0.077*	-
Research	22.31±4.93	20.33	24.44	*(1,92)*		
Books	25.07±4.93	23.74	26.41			
Medical	28.50±9.19	22.00	35.0			
Social Media	23.12±5.84	18.66	27.0			
Employment						
Part time	21.09±5.24	18.16	24.74	*4.352*	*<0.040*	*0.214*
Full time	24.47±5.02	23.33	25.55	*(1,92)*		
Use of technology						
Very proficient	23.17±6.44	20.22	26.54	*1.147*	*0.335*	-
Proficient	24.65±4.75	23.52	25.81	*(1,92)*		
Somewhat proficient	21.42±3.99	18.50	24.80			
Not Proficient	22.66±7.63	16.0	31.0			

In the current study females do more practice as compared to males with the age group of 25-30 years and have proficient use of technology.

4. DISCUSSION

Results of current study show that males have more adequate knowledge as compared to females with p-value <0.001 which is significant. There are many studies in different programs where both genders have different percentage of knowledge either adequate or inadequate. The good number of the pharmacists recognize the role of the providing management services in the improvement of use of medications [18].

A similar study was conducted in Lahore on undergraduates from different fields in which females (68.2%) showed higher rate of participation as compared to males (31.8%) [19]. Age groups ranging from 20-25 and above 30 both shows adequate knowledge with significant p-value that is <0.002 as compared to the age group with 25-30. It is may be due to their experience in the field. A study conducted in a country which shows inadequate knowledge of different age groups, they concluded that knowledge of the community pharmacists needs to improve their knowledge [20].

Pharmacists with bachelor's education have more adequate knowledge with p-value0.179 which is insignificant as compared to pharmacist with master's education. A study conducted in past shows also shows that pharmacists with bachelors' education have more adequate knowledge [21]. Unmarried pharmacists have more adequate knowledge as compared to married pharmacist with p-value <0.027 which is significant as compared to married pharmacists. Findings show that the personal circumstances such as the marital status does not heavily affect professional and educational adequacy. Our study shows similarity with a study conducted in the Egypt [22].

Sources of information shows that most of the pharmacists use books for their knowledge, and knowledge of those who used books as a source of information have more adequate knowledge with p-value 0.099 which is insignificant as compared to those who attend seminars or other

sources of information. Programs relevant to the patient education have conducted in different countries. A study conducted shows that more than 30% of the community pharmacists implements on different sources of information [21].

Pharmacists with full time employment have more adequate knowledge as compared to those with part time employment with p-value 0.343 which is insignificant. Similar study was conducted in Egypt which shows that part time employees have more time to improve their knowledge but full-time employees have good knowledge [22].

One of the most important findings in this study is use of technology. Current study shows that those pharmacists who use technology more proficiently have more adequate knowledge as compared to those who do not use technology proficiently with p-value <0.005 which is significant. This shows that those who are more proficient in the technology are significantly more likely to be the adequate. A study conducted in 2023 shows that those who does not use technology to improve their knowledge about diseases have less adequate knowledge as compared to those who use technology for their better knowledge [23].

This study presents that males have better attitude as compared to females with 63.48% but the p-value with 0.902 for both genders is insignificant. The cross-sectional study conducted in Egypt in 2022 contravenes with our present study suggesting that females have significantly higher attitude scores when compared to males [22]. The present study indicates that participants of age group above 30 with 65.66% have better attitude than other age groups. The p-value with 0.305 for age is insignificant. However, relevant study was conducted in Indonesia in 2019 which contradicts with present study indicating that pharmacists with age group 31-40 have lowest score for attitude [24].

The p-value of 0.871 for level of education is insignificant. This study indicates that participants having master's level of education with 63.93% have better attitude than participants having bachelors level education with 63.01%. Relevant study was conducted in Lebanese in 2019 which also indicates same results that the level of education of participants does not have a significant relationship towards

their attitude in managing chronic disease [25]. This study indicates that married participants with 64.14% have better attitude than unmarried participants. However, the p-value of 0.627 for this variable is insignificant. A relevant study was conducted concerning community pharmacists which showed that majority of pharmacists participating have overall positive attitude (Evans et al.,2021).

The participants having seminars as their source of information have better attitude than other participants having other sources of information. The p-value is 0.497 which is insignificant. A study conducted in Pakistan in 2021 regarding community pharmacists ascertained that majority of participants use social media as their primary source of information [26]. The participants working part time with 68.59% have better attitude than participants working full time. Another study conducted in Egypt in 2022 resulted that working hours have an insignificant correlation with attitude of community pharmacists [27].

The p-value for employment status is 0.159 which is insignificant. The participants having somewhat proficient use of technology have better attitude of 66.66% than other participants. The p-value for use of technology is 0.730 which is insignificant. A study conducted in another country suggested that the correlation between majority of the demographics and attitude of community pharmacists is insignificant [28].

Results show no significant difference regarding practice between male and female gender with a p-value is 0.09. Although females have a higher mean practice score as compare to males, both genders show varied distribution but p-value being greater than 0.05 indicates a non-significant difference. These findings of the current study are similar with the results of the study conducted in Jordan that suggest that females have superior asthma management practice as compared to the males [29]. One of the major subject to control the chronic diseases is their cost.

A systematic review was written on cost of asthma in which different countries used to prescribe oral medications as compared to inhaled medication [30]. A significant association was observed between age and the practice with a significant p-value 0.01 and effect size of 0.311. Pharmacists between the age of 25-30 show better practice in management of chronic

diseases. These results are in line with the results of the research conducted in Indonesia that age of pharmacist effect the practice and pharmacist within the age group of 31-40 have low practice scores [31].

The results show that there is in-significant association between the higher education and better practice scores. Pharmacist with a bachelor degree show a higher mean practice score of 24.41 as compared to the pharmacist with the master degree having mean practice score of 23.16 These findings of the current study are in line with the results of the study conducted in Lebanon that suggest no significance between higher degree and practice score but PhD degree holders have higher mean practice score as compared to other degree holders [32].

The married and unmarried pharmacists show varied distribution but there is no significant association between the marital status and the practice with a value of p-value is 0.34. As the study conducted in Dakar, despite low level of knowledge in pharmacist the level of practice is satisfactory [33]. Using different source of information in practice of management of chronic diseases is not found to be associated with the practice with p-value 0.07, which indicate insignificant association. As research conducted in Ethiopia suggest only a few participants use scientific references and web pages while the majority does not refer to any reference material [34].

Employment status of the pharmacists has shown a significant association with the practice having p-value 0.04 and effect size of 0.214. Pharmacists working full time indicate higher practice scores. The results are in line with the results of the study done in Egypt that states that pharmacists with >100 patients have significant higher mean practice scores as compared to other groups [27]. The results show that degree to which a pharmacist is proficient is using in technology is not associated with the practice having p-value 0.335. However, the pharmacist that are proficient in technology have higher mean practice scores. As the research conducted in China suggested despite having a positive attitude most of the pharmacist do not have high level of practice [35,36].

5. CONCLUSION

Our study of knowledge, attitude and practice associated with community pharmacists in managing chronic disease is conducted in community pharmacies in Lahore, Punjab. The results show that knowledge of community pharmacists need to improve while attitude and practice is good. Current findings show that males have more adequate knowledge and positive attitude than females, while females do more practice than males. Age above 20-25 and above 30 show similar adequate knowledge but pharmacist above 30 shows better attitude, while pharmacist between age 20-25 shows better practice. Pharmacist with bachelor's degree have more adequate knowledge and practice while pharmacist with master level show more positive attitude. Unmarried pharmacist shows better knowledge, while married pharmacist have better attitude. Pharmacists that got information from books have better knowledge while participants from seminar have better attitude. The participants who worked full time have better knowledge and practice, while participant's who work part time shows better attitude. Participants that consider use of technology proficiently have better knowledge, attitude and practice.

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 writing or editing of manuscripts.

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ETHICAL APPROVAL

It is not applicable.

CONSENT

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

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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