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Abstract

Purpose: Chronic kidney disease has been recognized as a leading public health problem worldwide. The global estimated prevalence of CKD is 13.4%, whereas in Pakistan it is 21.2%. It is a growing health threat therefore understanding knowledge, attitudes, and practices associated with kidney diseases are vital for forming optimal policy and public health responses in the region.

Materials and Methods: This cross-sectional study was conducted nationwide. A total of 922 participants were enrolled in this study using convenience sampling technique. Data were obtained using a structured questionnaire in both English and Urdu languages. The questionnaire was designed in four sections, collecting information for demographic data, knowledge assessment, attitudes and practices related to kidney diseases. Descriptive statistics were used to describe demographic characteristics, mean and standard deviation were used for continuous variables. Scores more than 50 percent were classified as satisfactory knowledge about CKD.

FINDINGS: Based on the findings of this study majority of the participants (87%) had adequate knowledge regarding the risk factors and common causes of kidney diseases like hypertension, diabetes and excessive use of pain killers. However, knowledge about the proper diagnosis of Kidney diseases was lacking and more than half of the participants (58%) were of the opinion that urine's color, smell and quality is enough to detect kidney disease and lab test for detection is not exclusively needed for the diagnosis.

The thought of developing kidney disease was a concern for most of the participants, and even the participants in the well-earned subgroup of working professionals were concerned about the cost of treating kidney disease. A larger proportion of participants (41%) were worried about revealing their diagnosis of kidney disease within the community and up to 89.2% of the participants considered kidney diseases diagnosis as a risk factor for losing their jobs. Regarding the practices, 95.7 % of the participants were willing to visit medical doctor if they were diagnosed with kidney disease and were prepared to prefer medical treatment over Hakeem, homeopathy and home remedies. Overall, participants who are males, middle aged, postgraduate and those with no known co-morbidities and a professional job showed most adequate knowledge related to CKD

Implications to Theory Practice and Policy: Our study draws upon the Health Belief Model, a health behavior theory, and its validation is evident in the results obtained. The findings highlight a discernible disparity in chronic kidney disease (CKD) knowledge across diverse demographic groups. Notably, a substantial level of ignorance was identified among participants concerning the diagnosis of kidney diseases. Addressing this knowledge gap is imperative for enhancing the overall health of our general population.

Keywords: *Knowledge, Attitude, Practices, Kidney Diseases*

1.0 INTRODUCTION

Chronic Kidney Disease (CKD) represents a significant global health challenge, impacting millions of individuals worldwide. [1][2] It is being recognized as a Non communicable disease with a high prevalence of morbidity, and mortality [3]. CKD is a progressive and irreversible condition characterized by a gradual loss of kidney function, encompassing stages ranging from mild to severe impairment with potentially high prevalence all over the world and specifically in south Asian countries [4]

In Pakistan, the burden of CKD is increasing day by day [5] and the high prevalence is influenced by a combination of genetic factors, lifestyle choices, and limited healthcare access. The country's diverse socio demographic landscape and variable healthcare infrastructure further compound the challenges in understanding and addressing CKD.

The significance of knowledge about CKD cannot be overstated, as awareness serves as a critical factor for early detection and key step to take preventive measures against the disease. [6] General public's and healthcare professionals' attitudes toward chronic kidney disease (CKD) significantly influence treatment adherence and the behavior of those seeking medical attention. By analyzing prevailing views, one might identify possible obstacles and enablers to the best care of chronic kidney disease (CKD), providing important information for focused interventions. [7]

A key component of the CKD trend in the population is practices connected to the disease, which range from lifestyle decisions that affect renal health to patterns of healthcare consumption.[3] Another crucial aspect of managing CKD-related issues is cultural sensitivity. Knowing the national norms will offer a practical perspective on the circumstances on the ground. [2] However, despite a potentially high prevalence of CKD all over the world and specifically in south Asian countries there remains a dearth of epidemic-logical data regarding disease burden and risk factors, and community awareness of this condition remains low [4]

It is crucial to adopts a holistic approach to recognize the intricate interplay between knowledge, attitudes, and practices—a triad critical for shaping CKD epidemiology and outcomes. Integrating the impact of cultural beliefs, traditional practices, and societal norms on health-related behaviors enables the development of contextually relevant interventions, with the goal of making a sustainable impact on CKD prevention and management. [3]

This study aims to assess the Knowledge, Attitudes, and Practices (KAP) associated with CKD in Pakistan, a populous South Asian country facing distinctive healthcare complexities. By unraveling the multifaceted factors influencing CKD at various levels, the study aims to provide actionable insights that inform evidence-based interventions tailored to the unique challenges faced by the Pakistani population in the realm of kidney health. This study also focuses on understanding the awareness of risk factors, diagnostic misconceptions, emotional responses, and preferences for healthcare providers

2.0 MATERIALS AND METHODS

This was a cross sectional study among general population and health care workers of Pakistan. A convenience sampling technique was used for data collection. Sample size was calculated on Open Epi version 3. A total of 948 participants who met the inclusion criteria and gave consent were enrolled in the study, after removing 26 incomplete forms, total 922 participants were selected. Study was conducted over a period of six months, from 22nd January 2023 to 22nd June 2023 at different cities of Pakistan.

The online self-administered questionnaire's web link was distributed through Internet platforms such as Gmail and WhatsApp. Informed consent was obtained from each participant prior to fill the online questionnaire. To ensure a diverse perspective on chronic kidney disease (CKD), efforts were made to engage participants with all education levels including minimal level. Family members or caregivers were encouraged to fill questionnaire on behalf of individuals with limited literacy. The questionnaire was divided into four sections each for demographic data, assessment of knowledge, attitude and practices related to kidney diseases respectively. A pilot study involving 50 participants was conducted to assess the clarity, consistency, and time required for questionnaire completion.

Descriptive statistics was utilized and data were presented as frequencies and percentages for demographic variables, knowledge scores, attitudes, and practices. The criterion for adequate knowledge was set at ≥50 % correct answers in the knowledge assessment section. Data were entered and analyzed using SPSS version 20.

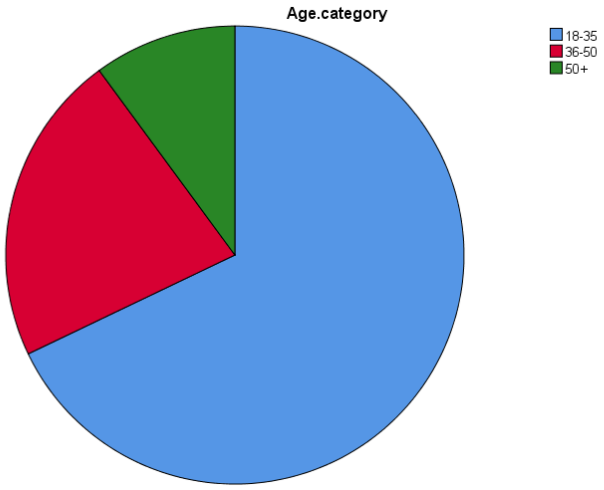
3.0 FINDINGS

A total of 948 participants took part in the study, 26 incomplete forms were rejected and total 922 participants were selected. According to our results the distribution of age is presented in Table-1 and Graph-1.

Table 1: Tabular Representation of Age Distribution

Age	Frequency (n)	Percent
18-35	626	67.9
36-50	203	22.0
50+	93	10.1
Total	**922**	**100.0**

Graph I : Graphical Representation of Age Distribution

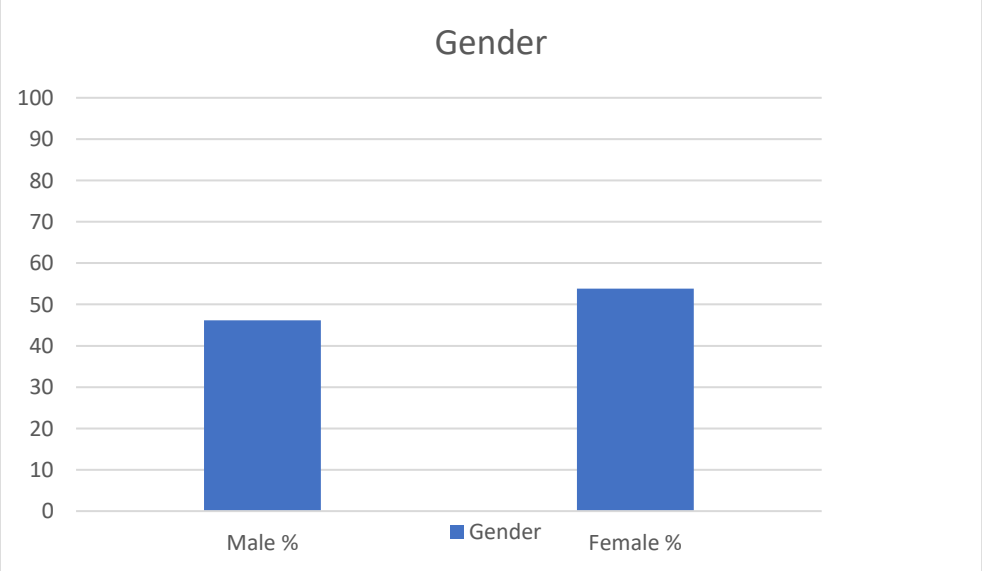


426 patients (46.2%) were males & 496 patients (53.8%) were females (as shown in Table-2 and graph II).

Table 2: Frequency Distribution of Gender

Gender	Frequency	Percent
Male	426	46.2
Female	496	53.8
Total	**922**	**100.0**

Graph II: Frequency Distribution of Gender



Co-morbidities data in our participants showed No known comorbidities in majority (80%) of the patients i.e. in 739 patients , Hypertension in 65 (7.0%),Diabetes Mellitus in 28 (3.0%), Known kidney diseases in 36 (3.9%), Lung Disease in 4 (0.4%),Hypertension and Kidney Disease together in 4 (0.4%),Hypertension and Diabetes Mellitus together in 38 (4.1%) and Hypertension, Diabetes Mellitus and Kidney Disease together in 8 (0.9%) as shown in Table-3

Table 3: Frequency Distribution of Comorbidities

Comorbidities

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	739	80.2	80.2	80.2
	Hypertension	65	7.0	7.0	87.2
	Diabetes Mellitus	28	3.0	3.0	90.2
	Kidney Disease	36	3.9	3.9	94.1
	Lung Disease	4	.4	.4	94.6
	HTN, CKD	4	.4	.4	95.0
	HTN, DM	38	4.1	4.1	99.1
	HTN, DM, CKD	8	.9	.9	100.0
	Total	922	100.0	100.0	

In our study the occupation of participant was Laborer /Daily wager in 30 (3.3%), business owner in 42 (4.6%), professional job in 633 (68.7%), 24 (2.6%) were housewives and rest 191 participants (20.7%) were unemployed and the Level of education was Undergraduate in 180 patients 19.5 %) and Graduate or above education in 742 (80.5%) In our study for the questions of scoring scale 804 patients (87.2%) were aware regarding the fact that high blood pressure

can cause kidney disease, 806 (87.4%) were aware regarding the fact that high blood sugar (diabetes) can cause kidney disease, when inquired about painkiller impact on renal health 827 patients (89.7%) were aware that excessive use of painkillers can cause kidney disease . 483 participants (52.4%) were of the wrong opinion that a person can tell if he/she has kidney disease just by the color, quality or smell of urine as shown by the chart

896 (97.2%) knew that kidney disease can be prevented if you follow advice of a medical doctor, 479 participant (52%) were of the wrong opinion that kidney controls our body's temperature however 790 (85.7%) satisfactorily knew that kidney function is to filter waste product from our body. Do you think Dialysis is a form of treatment for kidney disease? Was answered correctly by 797 (86.4%) but 527 (57.2%) incorrectly believed that antibiotics are a form of treatment for kidney disease as shown in the chart

While answering the questions related to attitude about the chronic kidney disease , 538 patients (58.4%) answered in affirmative when asked "Have you ever feared to have any kidney disease?" , and 848 (92.0%) agreed positively that they want to like learning about kidney problems but 849 (92.1%) affirmed that they will get worried about their future if they get diagnosed with kidney disease and similarly 768 (83.3%) and 789 (85.6%) informed that they will get worried about their chances of survival if they get diagnosed with kidney disease and their ability to work respectively as shown in Table-IV.

On inquiring about the cost of kidney disease being a problem 780 (84.6%) agreed and majority were not much concerned about their reputation in the community if they get diagnosed with kidney disease. When asked," If needed treatment for kidney disease, you will most likely take help from which of the following?" the answer was Medical Doctor in 894 patients (97.0%), Homeopath in 16 (1.7%) Hakeem in 8 (0.9%) & Home Remedies in only 4 participants (0.4%), as shown in Table-4

Table 4: Frequency Distribution for Response for the Question: If Needed Treatment for Kidney Disease, You Will Most Likely Take Help from Which of the Following?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Home Remedies	4	.4	.4	.4
	Hakeem	8	.9	.9	1.3
	Homeopath	16	1.7	1.7	3.0
	Medical Doctor	894	97.0	97.0	100.0
	Total	**922**	**100.0**	**100.0**	

TABLE 4: Tabular representation of Frequency Distribution for response for the question: If needed treatment for kidney disease, you will most likely take help from which of the following?

According to scoring scale ≥50% Correct Responses (Adequate knowledge) was noted in 802 participants (87%). The frequencies of age groups, gender, area of residence, level of education, occupation, co-morbidities, were calculated according to knowledge associated with chronic kidney diseases. The results are presented in Table-5, Table-6 Table-7 Table-8 Table-9 and Table-10 respectively.

The knowledge associated with chronic kidney diseases was adequate more in patients with age group of 36-50 years (97.5% with adequate knowledge among the given age category) and predominant in male gender (95.8% with adequate knowledge among the given gender

category) . Moreover, participants with graduates and above level education answered more correct answers for adequate knowledge assessment (95.6% with adequate knowledge among the given level of education). Urban area residents and participants with a professional job were the predominant group regarding the adequacy of knowledge related to CKD (94.2% with adequate knowledge among the given area of residence and 96.8% with adequate knowledge among the given occupation category). The participants with no co-morbid were with the most adequate knowledge regarding CKD (96.8% with adequate knowledge among the given comorbid category). The adequacy of knowledge regarding CKD related to Age, Gender, Area of residence, Level of Education, Occupation and Comorbidities are presented in tables 5, 6,7,8,9 and 10 respectively

Table 5: Adequacy Of Knowledge Regarding CKD Related to Age Category

Crosstab

			Knowledge Score Category		
			Knowledge Not Adequate	**Adequate Knowledge**	**Total**
Age.category	18-35	Count	47	579	626
		% within Age.category	7.5%	92.5%	100.0%
	36-50	Count	5	198	203
		% within Age.category	2.5%	97.5%	100.0%
	50+	Count	6	87	93
		% within Age.category	6.5%	93.5%	100.0%
Total		**Count**	**58**	**864**	**922**
		% within Age.category	**6.3%**	**93.7%**	**100.0%**

Table 5– Tabular representation of adequacy of knowledge regarding CKD related to age category

Table 6: Adequacy of Knowledge Regarding CKD Related to Gender

Crosstab

			Knowledge Score Category		
			Knowledge Not Adequate	**Adequate Knowledge**	**Total**
Gender	Male	Count	18	408	**426**
		% within Gender	4.2%	95.8%	**100.0%**
	Female	Count	40	456	**496**
		% within Gender	8.1%	91.9%	**100.0%**
Total		Count	58	864	**922**
		% within Gender	6.3%	93.7%	**100.0%**

Table 06– Tabular representation of adequacy of knowledge regarding CKD related to gender

Table 7: Adequacy of Knowledge Regarding CKD Related to Area of Residenc

Crosstab

			knowledge score category		
			knowledge not adequate	Adequate Knowledge	Total
Area of residence	Urban	Count	52	840	892
		% within Area of residence	5.8%	94.2%	100.0%
	Rural	Count	6	24	30
		% within Area of residence	20.0%	80.0%	100.0%
Total		Count	58	864	922
		% within Area of residence	6.3%	93.7%	100.0%

Table 7– Tabular representation of adequacy of knowledge regarding CKD related to area of residence.

Table 8: Adequacy of Knowledge Regarding CKD Related to Level of Education

Crosstab

			Knowledge Score Category		
			Knowledge Not Adequate	**Adequate Knowledge**	**Total**
level of education	undergraduate	Count	25	155	180
		% within level of education	13.9%	86.1%	100.0%
	graduate or above	Count	33	709	742
		% within level of education	4.4%	95.6%	100.0%
Total		Count	58	864	922
		% within level of education	6.3%	93.7%	100.0%

Table 8– Tabular representation of adequacy of knowledge regarding CKD related to level of education

Table 9: Adequacy of Knowledge Regarding CKD Related to Occupation

Crosstab

			Knowledge Score Category		
			Knowledge Not Adequate	Adequate Knowledge	Total
Occupation	Unemployed	Count	17	169	186
		% within Occupation	9.1%	90.9%	100.0%
	Daily wager/ laborer	Count	6	24	30
		% within Occupation	20.0%	80.0%	100.0%
	Housewife	Count	7	24	31
		% within Occupation	22.6%	77.4%	100.0%
	Business	Count	8	34	42
		% within Occupation	19.0%	81.0%	100.0%
	Professional job	Count	20	613	633
		% within Occupation	3.2%	96.8%	100.0%
Total		Count	58	864	922
		% within Occupation	6.3%	93.7%	100.0%

Table 9– Tabular representation of adequacy of knowledge regarding CKD related to Occupation.

Table 10: Adequacy of Knowledge Regarding CKD Related to Comorbidities

Crosstab

			Knowledge Score Category		
			Knowledge Not Adequate	Adequate Knowledge	Total
Comorbids	None	Count	23	692	715
		% within Comorbids	3.2%	96.8%	100.0%
	HTN	Count	8	60	68
		% within Comorbids	11.8%	88.2%	100.0%
	DM	Count	9	24	33
		% within Comorbids	27.3%	72.7%	100.0%
	CKD	Count	10	36	46
		% within Comorbids	21.7%	78.3%	100.0%
	HTN, CKD, DM	Count	8	52	60
		% within Comorbids	13.3%	86.7%	100.0%
Total		Count	58	864	922
		% within Comorbids	6.3%	93.7%	100.0%

Table 10– Tabular representation of adequacy of knowledge regarding CKD related to Comorbidities

Dicussion

Chronic Kidney Disease (CKD) is a complex and pervasive health issue, and understanding the nuanced findings from this study is crucial for formulating effective public health strategies. The study revealed a commendable level of awareness (87%) regarding the risk factors associated with CKD, including hypertension, diabetes, and excessive painkiller use. This

suggests that public health campaigns focusing on these aspects have been relatively successful in disseminating information. However, a substantial knowledge gap exists concerning the diagnostic process. Over half of the participants (58%) believe wrongly that urine color, smell, and quality are sufficient indicators, neglecting the importance of laboratory tests. In a similar study in Africa 73% had this incorrect belief [8]

This discrepancy in understanding highlights the need for targeted educational initiatives aimed at elucidating the diagnostic procedures for CKD. Emphasizing the role of medical professionals in diagnosing and managing CKD could help dispel misconceptions and encourage timely and accurate assessments. Additionally, public health campaigns should underscore the significance of routine check-ups and diagnostic tests, especially for individuals with risk factors. Education status has been a significant factor in difference in improving health outcomes for patients with kidney diseases, this is more evident specifically in studies from developed countries [9]

Comprehending fundamental health information is vital for making informed healthcare decisions, resulting in better health outcomes. Significantly, directing efforts towards individuals with a heightened risk of low health literacy has proven effective in enhancing the care provided for chronic kidney disease (CKD). [10, 11]. Public health efforts aimed at improving aware-ness have been effective in other low-resource settings, and our findings suggest that such efforts would also be well-received in Pakistan [12-14]

Several participants demonstrated a willingness to pursue healthcare from different channels, encompassing approaches like consulting hakeems, utilizing home remedies, and incorporating homeopathic medicine. This aligns with existing literature, which indicates a common trend of frequent utilization of traditional health services for managing chronic diseases. [15].

Despite the effectiveness of traditional medicines in treating many conditions, it is crucial to recognize that some of them, including those specifically used for localized treatment of kidney disease [16–23], are known to have nephrotoxic effects. Additionally, our survey instrument underwent rigorous testing to ensure construct validity, content validity, and reliability. The study identified a prevalent concern among participants (41%) about disclosing their CKD diagnosis within the community, with a significant proportion (89.2%) considering it a risk factor for potential job loss. This finding underscores the broader societal implications of chronic diseases and the need for comprehensive support systems. This stigmatization surrounding CKD and other chronic conditions can hinder individuals from seeking timely medical care, potentially exacerbating their health outcomes and proved in studies as well [25]

To address this issue, community-based awareness programs should focus not only on the medical aspects of CKD but also on fostering an understanding and supportive environment. Workplace education initiatives could play a pivotal role in dispelling myths and prejudices associated with CKD, encouraging open dialogue, and creating a culture of empathy and inclusivity.

The study indicates a positive inclination among participants towards seeking medical treatment if diagnosed with CKD. A staggering 95.7% expressed a willingness to consult a medical doctor, with a preference for conventional medical care over alternative approaches like homeopathy or traditional medicine, while minority was willing to get treated with options other than healthcare professionals. This is matching with a similar study in Tanzania where majority showed willingness to visit health professional if needed but some still showed eagerness to get treated with traditional medicines [26]

This inclination towards medical intervention is encouraging, and efforts should be directed at reinforcing the importance of regular health check-ups and early intervention. Public health campaigns should highlight the benefits of early detection and management in preventing the progression of CKD, reducing healthcare costs, and improving overall quality of life.

The demographic data revealed a high prevalence of individuals with no known comorbidities (80%). However, within the subgroup with comorbidities, hypertension and diabetes were prominent, either individually or in combination. This underscores the interconnected nature of chronic diseases and emphasizes the necessity of an integrated healthcare approach.

Healthcare systems should focus on developing strategies that address both primary diseases and associated comorbidities. Integrated care models, where healthcare providers collaborate to manage multiple health conditions simultaneously, could be beneficial in improving overall health outcomes and reducing the burden on the healthcare system. [27]

The study identified several misconceptions regarding CKD, such as 52.4% of participants believing that the color, quality, or smell of urine alone can indicate the presence of kidney disease. A similar study in Tanzania showed 27 % believed the same [8] Educational interventions should target these specific misconceptions, emphasizing the importance of objective diagnostic measures.

Furthermore, the study highlighted that 57.2% of participants incorrectly believed that antibiotics are a form of treatment for kidney disease, while in the study from Tanzania only 26% believed this [8]. This indicates a need for tailored educational campaigns not only on CKD but also on appropriate antibiotic use, reducing the risk of misinformation and antimicrobial resistance.

Individuals within the age range of 36-50 exhibited a commendable level of understanding concerning chronic kidney diseases, particularly among males. This pattern aligns with broader health literacy trends observed in other surveys [28]. Furthermore, respondents holding graduate and higher-level educational qualifications demonstrated a superior grasp of knowledge, affirming the well-established correlation between education and enhanced health outcomes [11]. Urban dwellers and those engaged in professional occupations emerged as the primary cohort possessing substantial knowledge regarding chronic kidney diseases.

It is noteworthy that participants without any concurrent health conditions displayed the most robust comprehension of chronic kidney diseases. This observation is particularly reassuring given that researches indicates a direct correlation between the progression of chronic kidney disease and the emergence of multiple comorbidities [29]. Elevating awareness and understanding related to chronic kidney diseases can serve as a preventive measure, averting the burden of various health issues for otherwise healthy individuals. Of paramount concern was the notably diminished level of knowledge adequacy observed among participants afflicted with diabetes mellitus. Considering diabetes as the most notorious risk factor for chronic kidney disease (CKD) [30], this outcome underscores the urgent need for immediate implementation of measures to enhance awareness within this specific patient cohort.

Overall, this study provides valuable insights into the knowledge, attitudes, and practices associated with CKD in Pakistan. While there is commendable awareness regarding risk factors, there are notable gaps in understanding the diagnostic process and potential societal repercussions. Addressing these gaps requires multifaceted strategies, including targeted

educational campaigns, workplace sensitization programs, and integrated healthcare approaches.

Public health initiatives should strive to create a comprehensive understanding of CKD, fostering a supportive environment that encourages timely medical intervention and reduces the stigma associated with chronic diseases. By addressing these issues, the healthcare system can better respond to the challenges posed by CKD, ultimately improving outcomes for individuals and the community at large.

The study, with its cross-sectional design, lacks the ability to establish causal relationships and may be influenced by unmeasured confounding variables. The nonrandom snowball technique (online questionnaire) in data collection could introduce selection bias, excluding those with limited digital literacy. Despite efforts to minimize bias through Urdu and English surveys and smartphone considerations, there's a potential underrepresentation of uninterested or uncooperative individuals. The perceived minimal bias due to language options and high smartphone accessibility may impact results.

The study might underestimate accurate knowledge, attitudes, and practices (KAP) related to Chronic Kidney Disease, especially in individuals concerned about infectious diseases who were not included. Additionally, the predominantly educated participant sample makes the study outcomes not fully representative of the Pakistani population. Further research is recommended, particularly in light of significant challenges in health, economic, and social aspects in Pakistan.

4.0 CONCLUSION AND RECOMMENDATIO NS

Conclusion

In conclusion, the basic knowledge about kidney diseases seems adequate but the point of concern is that majority are unaware of the fact that kidney disease can only be diagnosed with proper medical tests. The adequacy in knowledge regarding CKD was most predominant among males, middle aged, urban dwellers, participants with no-comorbidities and those with higher education level and professional jobs. Anxiety related to kidney disease's diagnosis was observed in majority of the participants. The main reasons behind this were noted to be the cost of the kidney disease treatment, public opinion and fear of losing job due to the diagnosis. Finally greater number of participants showed their willingness to follow advice of a medical doctor for kidney disease instead of using alternate medication, this shows general population's trust in medical doctor for kidney disease management.

Recommendations

The study recommends a comprehensive strategy for addressing Chronic Kidney Disease (CKD). This includes targeted education to improve understanding and dispel misconceptions, along with broad awareness programs and workplace education initiatives. Special attention should be given to individuals with low health literacy. Advocating for an integrated healthcare approach, tailored interventions for CKD risk groups, and addressing societal implications, such as job loss fears, are crucial. To enhance future studies, overcoming study limitations through diverse data collection methods and broader participant samples is advised. Further research is encouraged to explore CKD challenges in health, economic, and social aspects, promising a more informed approach to CKD management in Pakistan.

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