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Knowledge and familiarity of chronic kidney disease risk factors among Saudi populations

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ABSTRACT

Background: (CKD) is a complex disorder that results in an excessive buildup of fluid and waste in the blood, which causes the kidneys to be unable to work correctly due to structural or functional damage. The purpose of this paper was to evaluate public understanding of chronic renal disease risk factor among adults in Saudi population by using information gathered from general Saudi population. *Methodology:* This is a cross sectional study involved a total of 1111 participants from the kingdom of Saudi Arabia above eighteen years of age for both genders. The data was analysed with the help of Microsoft excel and SPSS. *Results:* The study included 1111 participants 67.9% females and 32.1% males. 23.7% of participants reported that they had a family-member with kidney disease, in 51% of them family-member was from first class. 71.6% reported moderate knowledge, 17.5% low knowledge and only 11% reported high knowledge. 44.9% reported moderate attitude followed by 39.9% low attitude and only 15.2% reported high attitude score. *Conclusion:* We concluded from the current research that the participants had good understanding of CKDs and that the results were similar to certain studies conducted in Saudi Arabia and better than other studies from different countries. In addition, individuals in our study indicated a positive attitude toward CKDs, which was consistent with other studies.

Keyword: Chronic kidney disease, CKD, Prevalence, Knowledge, Saudi Arabia.

1. INTRODUCTION

Chronic kidney disease, (CKD) is a complex disorder that results in an excessive build-up of fluid and waste in the blood, which causes the kidneys to be unable to work correctly due to structural or functional damage. CKD is heavily impacted financially on global healthcare systems (Mosleh et al.,

2020). CKD advances to (end stage renal illness, ESRD), if CKD is left untreated and if the patient survives the ravages of cardiovascular and other consequences, where life cannot be prolonged without dialysis or a kidney transplant (Li et al., 2020). The prompt therapy initiation and management of CKD risk factors including hypertension can be slowed down the loss of renal function (Stolpe et al., 2021). CKD (chronic kidney disease) is a significant, globally prevalent health problem that is rising (Al-Husayni et al., 2021). According to estimates, chronic kidney illness affects-between (8%-16%) of the world's population (Alateeq et al., 2018). With the prevalence of CKD at 32.3%, high-risk groups such as those with diabetes mellitus, hypertension and HIV (human immunodeficiency virus) were more vulnerable (Ngendahayo et al., 2019). When CKD progresses to end-stage renal disease (ESRD), it required lifelong dialysis or renal replacement treatment, but it is also associated with a higher risk of morbidity, (particularly from CVD), death, hospitalization and cognitive dysfunction (Ji et al., 2019).

More than ½ million deaths have been brought on by CKD worldwide since 1990. Between 2005 and 2013, the age-standardized mortality rate for chronic renal disease risen by almost 37% globally (Gheewala et al., 2018). A 2010 epidemiological study conducted to found that 5.7 percent of the population overall is affected by CKD, In Saudi Arabia, there were more than 2 million cases of CKD and 3818 deaths from CKD in 2017 (Alobaidi, 2021). Generally, CKD rank as the 12th and 17th leading reasons for dying and disability worldwide, respectively. Over 500 million people worldwide suffer from one of the chronic kidney disorders, which affect approximately 10–13 percent of the overall population (Alshahrani et al., 2022). However, research regarding the understanding of CKD risk factors is limited especially in Saudi Arabia. CKD is increasing perceptively in KSA and become a global disease, because of its high prevalence and its overburden the best way to minimize it and also decrease CKD-related comorbidities such as hypertension, diabetes, hyper-lipidemia by management of disease progression by early screening and preventive programs.

Despite the development and health progress through the establishment of many hospitals and health centre's scattered throughout Saudi Arabia, this did not prevent the spread of some diseases, especially chronic renal failure, which is one of the chronic and dangerous diseases that spread and through that the research dealt with highlighting the disease of failure Chronic renal failure spatially and the attempt to link some natural and human variables in the spread of chronic renal failure disease, may we contribute to identifying the most important factors and causes leading to the development and increase of chronic renal failure disease and the lack of awareness of this disease. This study aims to assess awareness and knowledge of chronic-kidney disease risk factors among Saudi population.

2. MATERIALS AND METHODS

Study design

From February 2022 to November 2022, Saudi Arabia conducted this cross-sectional survey.

Study setting: Participants, recruitment and sampling procedure

It was through online questionnaire distribute among Saudi population; the questionnaire was inquired about public awareness about risk factors of CKD. The study population composed of adults above eighteen old and Saudi population.

Inclusion and Exclusion criteria

The study population include healthy adults who are above eighteen old, both genders in KSA. Adult patients or those under eighteen of age are excluded as well as non-Saudi population.

Sample size

The sample size was established using the Qualtrics calculator with a confidence level of 99%, margin of error 1%; a sample size of 666.

The Sample size was established using the formula: $n= P (1-P) * Z\alpha^2 / d^2$ with a confidence level of 95%;

n: Calculated sample size

Z: The z-value for the selected level of confidence (1- a) = 1.96.

P: An established prevalence of knowledge

Q: (1 – 0.50) = 50%, i.e., 0.50

D: The maximum acceptable error = 0.01.

So, the calculated minimum sample size was:

$n = (1.96)^2 X 0.50 X 0.50/ (0.01)^2 = 666.$

Method for data collection and instrument (Data collection Technique and tools)

The data was collected through distribution of online questionnaire, the questionnaire was used as study tool. This tool was obtained from Alshahrani et al., (2022). The CKD knowledge questionnaire consisted of 30 questions classifieds into main three sections. Section one contained socioeconomic background characteristics, family history and medical history questions. The second section includes information about CKD like definition of the disease, symptoms of CKD and the risk factors. The third part includes questions on CKD awareness and patient attitude towards CKD.

Pilot test

The opinion poll was dispersed on 20 individuals and asked to fill it. This was done to test the simplicity of the questionnaire and the feasibility of the study. Data of the pilot study was excluded from the final data of the study.

Scoring system

The structured questionnaire used in this study was taken from previous conducted study, the CKD knowledge questionnaire has 30 questions. There are three possible answers to the 13 questions in the knowledge section: "True", "False" and "I don't know." The scores for right answers were 1, while the scores for wrong answers were 0. Since that was deemed to be an uneducated comment, I don't know received a score of 0. The entire score is divided into three proportionate ordinal scales: Low (0–4), moderate (5–9) and high (10–13). (Score 10–13). Each response to the six questions in the attitude segment was recorded on a 5-point Likert scale. "Strongly agree" received a score of 5, while "Agree", "Natural", "Strongly disagree" and "Disagree" received scores of 4, 3, 2, and 1, respectively. The overall score is divided into three levels: Low (scores 18 to 30), moderate (scores 31 to 43) and high (scores 44 to 56).

Analyzes and entry method

The data was entered on the computer using the “Microsoft Office Excel Software” program (2016) for windows. Data was then transfer to the Statistical Package of Social Science Software (SPSS) program, version 20 (IBM SPSS Statistics for Windows, Version 20.0. Armonk, NY: IBM Corp.) to be statistically analyzed. The Chi-square test was used to calculate the significant association and finally, tables and figures were used to display the results.

3. RESULTS

Table 1 Show socio demographic characteristics of participants, the study included 1111 participants 67.9% females and 32.1% males. 50.7% of participants single and 45.7% married, 45.2% aged 20-30 years, 16.2% 41-50 years, 15% 31-40 years and 12.3% less than 20 years. Nearly third of participants 33.4% from Western region, 24.7% from Eastern region, 22.3% from north and 13.1% from southern region. As regards educational qualification, most participants 71.4% in college or above and 24.8% in secondary level. 38.4% were students, 25.4% unhealthy employee and 23.8% were unemployed.

Table 1 Socio demographic characteristics of participants (n=1111)

Parameter		No.	%
Gender	Male	357	32.1
	Female	754	67.9
Nationality	Saudi		
	Non- Saudi		
Marital status	Single	563	50.7
	Married	508	45.7
	Divorced or widow	40	3.6
Age	Less than 20	137	12.3
	20-30	502	45.2
	31-40	167	15.0
	41-50	180	16.2
	51-60	96	8.6
	More than 60	29	2.6

place of residence	Southern	146	13.1
	Eastern	274	24.7
	North	248	22.3
	Western	371	33.4
	Central	72	6.5
Educational qualification	Primary / lowe	6	.5
	Medium	37	3.3
	Secondary	275	24.8
	College or above	793	71.4
Occupation	Student	427	38.4
	Unhealthy employee	282	25.4
	health sector employee	56	5.0
	Retired	82	7.4
	Unemployed	264	23.8

Table 2 Illustrate family-history and medical history, 23.7% of participants reported that they had a family-member with kidney disease (Figure 1), in 51% of them family-member was from first class. The majority of participants 80% don't have chronic disease also, the majority 93.5% don't have kidney disease. In cases with kidney disease 48.6% reported it was from more than a year. Figure 2 Shows the knowledge score towards CKD among participants, 71.5% reported moderate knowledge, 17.5% low knowledge and only 11% reported high knowledge.

Table 2 Family history of CKD among participants (n=1111).

Parameter		No.	%
A family member with kidney disease	Yes	263	23.7
	No	848	76.3
If the answer is yes, what is the relationship?	From first class	134	51.0
	Second class	74	28.1
	Other relatives	55	20.9
Do you have chronic diseases?	Hypertension	55	5.0
	Kidney disease	16	1.4
	Diabetes	65	5.9
	Immune disease	18	1.6
	Other	68	6.1
	There is no	889	80.0
If you have kidney disease, mention it	Kidney cysts	9	.8
	Kidney stones	33	3.0
	Kidney infection/inflammation	15	1.4
	Renal failure	15	1.4
	There is no	1039	93.5
If you have kidney disease, for how long (per month)	Less than a month	10	13.9
	1-3 months	10	13.9
	4-6 months	6	8.3
	7-9 months	7	9.7
	10-12 months	4	5.6
	More than a year	35	48.6

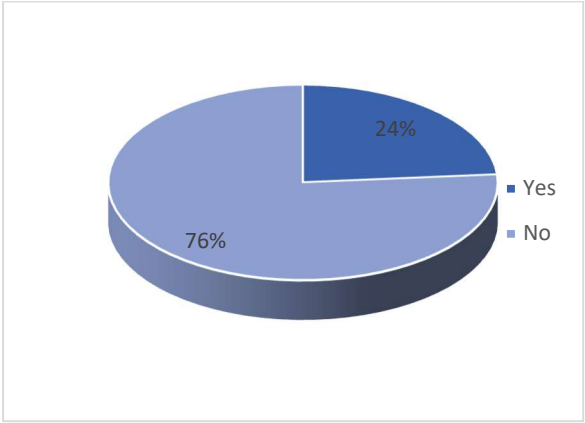

Figure 1 Show family member with kidney disease.

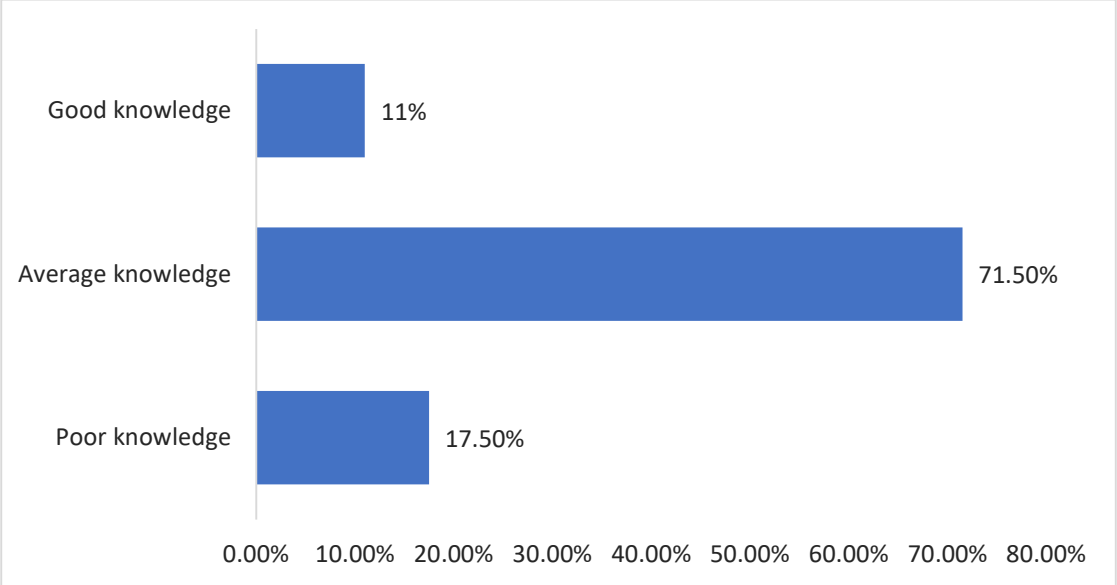

Figure 2 Participants' knowledge score towards CKD (n= 1111)

As illustrated in table (3), the-relation between-knowledge-score of CKD and socio demographic characters; there was no-significant-association between knowledge score and gender, age marital status educational qualification, occupation and place of residence (P>0.05). As shown in figure 3, attitude score towards CKD among participants; 44.9% reported moderate attitude followed by 39.9% low attitude and only 15.2% reported high attitude score.

Table 3 Association between participants knowledge scores with their socio demographic characters (n=1111)

		Knowledge score			Total (N=1111)	P value
		Low level	Average level	High level		
Gender	Male	150	57	150	357	0.409
		33.9%	33.7%	30.1%	32.1%	
	Female	293	112	349	754	
		66.1%	66.3%	69.9%	67.9%	
Age	Less than 20	65	19	53	137	0.088
		14.7%	11.2%	10.6%	12.3%	
	20 -30	207	70	225	502	
		46.7%	41.4%	45.1%	45.2%	
	31 - 40	66	21	80	167	

		14.9%	12.4%	16.0%	15.0%	
	41 -50	64	29	87	180	
		14.4%	17.2%	17.4%	16.2%	
	51 - 60	29	25	42	96	
		6.5%	14.8%	8.4%	8.6%	
	More than 60	12	5	12	29	
		2.7%	3.0%	2.4%	2.6%	
Marital status	Married	186	84	238	508	0.239
		42.0%	49.7%	47.7%	45.7%	
	Single	241	77	245	563	
		54.4%	45.6%	49.1%	50.7%	
	Divorced or widow	16	8	16	40	
		3.6%	4.7%	3.2%	3.6%	
Educational qualification	Primary / lower	3	0	3	6	0.395
		0.7%	0.0%	0.6%	0.5%	
	Medium	21	3	13	37	
		4.7%	1.8%	2.6%	3.3%	
	Secondary	106	41	128	275	
		23.9%	24.3%	25.7%	24.8%	
	College or above	313	125	355	793	
		70.7%	74.0%	71.1%	71.4%	
Occupation	Student	174	65	188	427	0.300
		39.3%	38.5%	37.7%	38.4%	
	Unhealthy employee	110	49	123	282	
		24.8%	29.0%	24.6%	25.4%	
	Health sector employee	15	12	29	56	
		3.4%	7.1%	5.8%	5.0%	
	Retired	32	14	36	82	
		7.2%	8.3%	7.2%	7.4%	
	Unemployed	112	29	123	264	
		25.3%	17.2%	24.6%	23.8%	
place of residence	Southern	54	21	71	146	0.596
		12.2%	12.4%	14.2%	13.1%	
	Eastern	107	43	124	274	
		24.2%	25.4%	24.8%	24.7%	
	North	95	47	106	248	
		21.4%	27.8%	21.2%	22.3%	
	Western	154	51	166	371	
		34.8%	30.2%	33.3%	33.4%	
	Central	33	7	32	72	
		7.4%	4.1%	6.4%	6.5%	

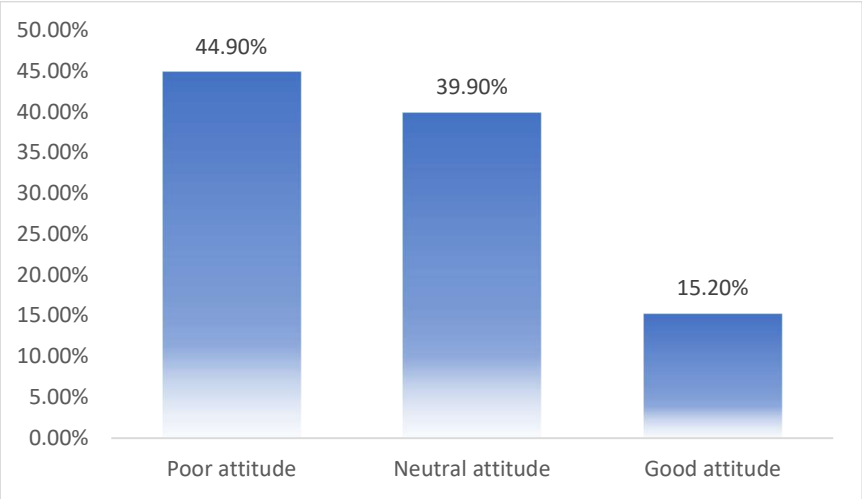

Figure 3 Participants' practice towards CKD (n= 1111)

Table 6 Illustrate the relation between attitude score of CKD and socio demographic characters. There was significant association between-attitude score and gender (P=0.001), age (p=0.005), educational qualification (p=0.021) and occupation (p=0.021) but, there was no-significant association found with marital status and place of residence (P>0.05).

Table 6 Association between participants attitude scores with their socio demographic characters (n=1111)

		Attitude score			Total (N=1111)	P value
		Low level	Average level	High level		
Gender	Male	108	560	86	754	0.001
		55.7%	70.4%	70.5%	67.9%	
	Female	86	235	36	357	
		44.3%	29.6%	29.5%	32.1%	
Age	Less than 20	27	103	7	137	0.005
		13.9%	13.0%	5.7%	12.3%	
	20 -30	82	368	52	502	
		42.3%	46.3%	42.6%	45.2%	
	31 - 40	39	116	12	167	
		20.1%	14.6%	9.8%	15.0%	
	41 -50	33	118	29	180	
		17.0%	14.8%	23.8%	16.2%	
	51 - 60	9	70	17	96	
		4.6%	8.8%	13.9%	8.6%	
	More than 60	4	20	5	29	
		2.1%	2.5%	4.1%	2.6%	
Marital status	Married	93	357	58	508	0.248
		47.9%	44.9%	47.5%	45.7%	
	Single	93	414	56	563	
		47.9%	52.1%	45.9%	50.7%	
	Divorced or widow	8	24	8	40	
		4.1%	3.0%	6.6%	3.6%	
Educational qualification	Primary / lower	4	2	0	6	0.021
		2.1%	0.3%	0.0%	0.5%	

	Medium	52	198	25	275	
		26.8%	24.9%	20.5%	24.8%	
	Secondary	9	26	2	37	
		4.6%	3.3%	1.6%	3.3%	
	College or above	129	569	95	793	
		66.5%	71.6%	77.9%	71.4%	
Occupation	Student	57	328	42	427	0.021
		29.4%	41.3%	34.4%	38.4%	
	Unhealthy employee	55	191	36	282	
		28.4%	24.0%	29.5%	25.4%	
	Health sector employee	8	40	8	56	
		4.1%	5.0%	6.6%	5.0%	
	Retired	15	53	14	82	
		7.7%	6.7%	11.5%	7.4%	
	Unemployed	59	183	22	264	
		30.4%	23.0%	18.0%	23.8%	
place of residence	Southern	28	101	17	146	0.159
		14.4%	12.7%	13.9%	13.1%	
	Eastern	55	184	35	274	
		28.4%	23.1%	28.7%	24.7%	
	North	29	188	31	248	
		14.9%	23.6%	25.4%	22.3%	
	Western	71	268	32	371	
		36.6%	33.7%	26.2%	33.4%	
	Central	11	54	7	72	
		5.7%	6.8%	5.7%	6.5%	

4. DISCUSSION

Chronic kidney disease (CKD) consists of a gradual and irreversible decline in kidney function for 3 months or more, involving the glomerulus, tubules and their endocrine action/being clinically identified by a reduction in the glomerular filtration rate of less than 60 mL/min/1.73 m2; and/or increased urinary albumin excretion (Debone et al., 2017; Jha et al., 2013). It affects more than 10 percent of the world's population, has become a global public health crisis in recent decades. The global-frequency of (CKD) was estimated to be 9.1% in 2017 and 1.2 million deaths were attributed to it (Bikbov et al., 2020). Good-knowledge and early-identification of chronic-kidney illness (CKD) can help in preventing disease progression in its early stages and reducing undesired outcomes. Higher rate of early identification of Communities with elevated levels of CKD risk or those with early-stage or undiagnosed cases could contain these persons of knowledge and awareness about CKD (Ahmed et al., 2018). This is article conducted among 1111of Saudi population.

The study aimed to assess awareness and knowledge of chronic-kidney illness risk-factors among Saudi population. According to knowledge score towards CKD among participants, the results show that 71.6% reported moderate knowledge, 17.5% low knowledge and only 11% reported high knowledge. In accordance with our results another paper conducted among 401 individuals from Medina, Saudi Arabia reported that 64.1% of participants had sufficient-awareness, while 35.9% had insufficient awareness about CKD (Alharbi et al., 2018). Also, the study shown that 60.8% thought that DM was a risk factor for CKD, 59.6% and 50.9% informed that HTN and CHD respectively were risk factors for CKD (Ahmed et al., 2018b). However, In Southern Saudi Arabia, a descriptive cross-sectional was conducted among 1317 participants reported that exactly (28.6%) contributors had good-awareness-level-regarding CKDs while (71.4%) had poor awareness level (Alshahrani et al., 2022). Also, in Jeddah, another study conducted among 268 respondents reported-low-level of awareness (poor knowledge) of (kidney-disease) among participants (Al-Husayni et al., 2021). Nearly half of those surveyed identified the use of NSAIDs as a significant risk factor and nearly one-third of the individuals acknowledged that diabetic and Hyper-tension are risk-factors for (CKD) (Al-Husayni et al., 2021).

In Jazan Province, Saudi Arabia, another study carried out among 440 participants demonstrated that very few participants (27.3%) had good knowledge, while the remaining either had moderate (36.6%) (or) poor knowledge (36.1%) regarding CKD, It was observed that a very small percentage of participants (7.5% and 9.3%) had a solid understanding of the risk-factors and consequences associated-with-CKD, respectively and the vast majority (68.4% and 81.8%) had poor awareness of risk factors and complications associated with CKD, respectively (Assiry et al., 2022). Another cross-sectional online survey study conducted among 983 of the Population of Saudi Arabia, the study revealed that the studied population had an overall poor knowledge about CKD, the knowledge score of the study participants was 11.99 (± 4.70), with scores ranging from 0 to 22, 42.9% of the individuals had knowledge scores less than 11 and more than 1/2 of the individuals correctly identified DM, HTN and obesity as risk factors of CKD (Alobaidi, 2021). Also, in Malaysia, another study conducted among 103 adult male and female reported that the popular of individuals had poor knowledge (69.9%) towards the risk for CKD (Yusoff et al., 2016). In Tanzania, another study carried out among 606 there was a lack of understanding about kidney illness among individuals, according to their reports, overall weighted mean knowledge score was 3.28 (95% CI 2.94, 3.63) out of ten possible points (Stanifer et al., 2016). In India, results from another study conducted among 250 participants revealed that (36.4%) of subjects had good-knowledge and (63.6%) had poor knowledge (Sahu et al., 2022). As regards attitude score towards CKD among participants; 44.9% reported moderate attitude followed by 39.9% low attitude and only 15.2% reported high attitude score.

In accordance with our results another study conducted in KSA, reported that participants had good attitude towards CKDs and its related risk factors, current study shows that the vast majority 90.7% of the study participants agreed that they will go to a health facility if they have signs of kidney disease and 89.4% agreed that (early-detection) of CKD is important to slow its progress, 76.9% reported that chronic kidney disease carries high risk of death, 75.6% think that it is possible to prevent chronic kidney disease and only 46.2% think that is not too expensive to have a kidney screening test (Alshahrani et al., 2022). Also, in Malaysia, another study found that furthermost of the subjects had a good attitude level (68.9%) as well as good practices level (88.3%) towards the risk for CKD (Yusoff et al., 2016). However, another study conducted among African Americans to determine attitude towards early detection and screening for kidney disease and they found that the majority had poor attitude towards the prevention of CKD (Umeukeje et al., 2018). Also, in India, another study reported that nearly half of participants (51.6%) had poor attitude levels toward the risk for CKD (Sahu et al., 2022).

According to the relation between knowledge score of CKD and socio demographic characters; there was no significant connotation between knowledge-score and gender, age, marital status, educational qualification, occupation and place of residence (P>0.05). However, as regards the relation between attitude score of CKD and socio demographic characters the result show that there was significant associations between attitude score and gender (P=0.001), age (p=0.005), educational qualification (p=0.021) and occupation (p=0.021) but, there was no significant association found with marital status and place of residence (P>0.05). In contrast to our results in Medina, Saudi Arabia, another study found that there was a significant difference between knowledge and the mean of age (P-value=0.006), the level education was a significant factor (P =0.035), the individuals with university, high and secondary education were more dominant to have sufficient knowledge also, gender was significant factor (P =0.029) with knowledge about CKD however, marital status, was not significant factors (Alharbi et al., 2018). Also, another study reported that there was significant association between knowledge level of participant and age (p=0.011) good knowledge level regarding CKDs was detected old, aged participants more than who were aged 18-34 years, marital status (p=0.001) and work (p=0.001) but, no significant association found with gender and educational level (P>0.05) (Alshahrani et al., 2022).

Results from another study conducted in Jazan showed that participants' knowledge was significantly associated with being a student or being employed ($p < 0.001$), having completed graduate studies ($p < 0.001$), residing in urban areas ($p < 0.001$), fit in to the age-group (18–39 years) however, gender and nationality did not have any statistically significant effect which was similar to our findings (Assiry et al., 2022). Study found that there are significant associations between kidney disease knowledge score and age ($p = 0.014$), educational level ($p = 0.018$), marital status ($p = 0.023$), significantly higher CKD knowledge score was found among participants with higher age, higher educational attainments and who were married (Alobaidi, 2021). Moreover, another study conducted in Malaysia, indicated that there were significant associations between gender with knowledge ($p = 0.046$), age groups ($p =0.016$), education with knowledge (p=0.001), occupational ($p =0.001$) and family income with knowledge (p=0.001). However, there was no significant association between marital statuses with knowledge (Yusoff et al., 2016). As regards attitude, the study reported that here were significant associations between gender with levels of attitudes (p=0.028), age groups (p= 0.035), marital status ($p = 0.002$) and occupational with levels of attitudes (p= 0.001). Though there was no discernible connection between educational attainment and attitude levels (p= 0.612) (Yusoff et al., 2016). Another study reported that a significant correlation was noted between education and knowledge ($p < 0.050$) and significant association was also observed between education and occupation with attitude ($p < 0.001$ and $p < 0.050$, respectively) (Sahu et al., 2022).

5. CONCLUSION

From the present study we concluded that the participant had good knowledge towards CKDs and in general these results were similar to some studies conducted in Saudi Arabia and better than other studies from different countries. Also, participants from our study reported good attitude towards CKDs which was similar to other studies. Awareness campaigns are recommended to increases Saudi general population awareness of chronic kidney disease.

Recommendations

We recommend that further educational campaigns should be inaugurated to raise Awareness of chronic kidney disease among Saudi general population.

Ethical approval

The research proposal was approved by the Regional Research and Ethics committee of Taif University, with letter number (44-100).

Funding

This study has not received any external funding.

Conflict of interest

The authors declare that there is no conflict of interests.

Data and materials availability

All data sets collected during this study are available upon reasonable request from the corresponding author.

REFERENCES AND NOTES

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