

Kidney Health Status with abnormal renal function, UAE: Single center study

Dileep Kumar¹, Zahid N Qureshi², Mouza Saif Albdwawi³, Michael Y Fahmy⁴,

Hoda Mohamed⁵, Nael Qureshi⁶, Manal Sayed Rezzek⁷

Family Medicine HH^{1,2,3}, Cardiology HH⁴, Nephrology HH⁵, Internal Medicine^{6,7}

Correspondence; Dileep Kumar

Specialist Family Medicine Hatta Hospital (HH) UAE

Abstract:

Background:

Chronic Kidney disease (CKD) is progressive non communicable condition , under-recognized public health crisis and that affects 10%–15% of the world's population and estimated 850 million individuals globally. It is projected to become 5th leading cause of years of life lost (YLL) globally by 2040. CKD risk is higher in females then males (11.8% among women and 10.4% in men). 1 in 3 adults with diabetes (38.5%) and 1 in 4 adults with hypertension (24.5%) have kidney disease. Prevalence of CKD in Middle East is 8.2%. Aim of this study was to; determine abnormal renal function test and staging of CKD (eGFR), compare abnormal serum creatinine (eGFR) staging with other variables & determine speciality clinic (Diabetic and nephrology) referral of patients.

Study Methods: A retrospective single centre observational study conducted at Hatta hospital, UAE. Data was collected from 1/6/2023 to 31/5/2024 after fulfilling the eligibility criteria. Mean and standard deviation for continuous variables and percentages or proportions for categorical variables were calculated. This includes comorbid conditions, serum creatinine, eGFR, ACR & association of eGFR staging with other variables.

Results: Total 405 files were reviewed. Out of these 79% were male and 21% females. UAE nationals were more 56%. Among abnormal serum creatinine (eGFR); Stage 2 was most common in 59%, stage 3a (22%), stage 3b (8%), stage 4 (4%) & stage 5 (3%). Urine microalbumin A2 was found in 15% and A3 12%. Referral to Diabetic clinic was 18% and nephrology 15% of cases. Stage 2 was common in younger age group; 18–40 years 126 (31%) & 41–59 years 100 (25%) & while stage 3a was common in ≥60 years 64 (16%) cases (p value 0.000). Stage 2 was common in males 231 (57%) while stage 3a in females 35 (9%). Stage 3a was common in chronic diseases such as HTN 70 (17%, p value 0.000), dyslipidaemia 65 (16%, p value 0.000), DM 53 (13%, p value 0.000) & BPH 21 (5%, p value 0.06). Abnormal ACR was commonly found in stage 3a (9%, p value 0.03).

Conclusion: Chronic kidney disease is a silent killer. A person can loose up to 90% of kidney function before experiencing any signs and symptoms. Most people have no symptoms until CKD is advanced. This study found that the magnitude of chronic kidney disease in the study area was high. Hypertension and diabetes are the most significant factors for chronic kidney disease. Approaching change proactively versus reactively will best serve in prevention, early detection treatment options.

Key word: Serum creatinine, Albumin creatine ratio, kidney health, chronic kidney disease

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I. Introduction:

Chronic kidney disease (CKD) is under-recognized public health crisis. It is a progressive non communicable condition that affects >10% of the general population worldwide & estimated 850 million individuals globally [1]. It is projected to become 5th leading cause of years of life lost (YLL) globally by 2040 [2,3]. Global prevalence of chronic kidney disease is 9.5% [4]. CKD risk is higher in females then males (11.8% among women and 10.4% in men) [5]. Prevalence of the individual CKD stages is 3.5% (stage 1), 3.9% (stage 2), 7.6% (stage 3), 0.4% (stage 4), and 0.1% (stage 5) [6,7]. Approximately 1 in 3 adults with diabetes (38.5%) and 1 in 4 adults with hypertension (24.5%) have kidney disease [7]. Prevalence of CKD in Middle East is 8.2%, ranged from 4.9% in Yemen, 12.2% in Lebanon [8] & KSA is 4.8% [9]. The prevalence of CKD stages 3–5 in Abu Dhabi was 2.8% in females and 4.6% in males [10]. Progression of CKD is influenced by numerous cardiovascular and non-cardiovascular risk factors that are preventable, and it is accelerated in the presence of multiple risk factors (7).

Aim of this study was to; determine abnormal renal function test and staging of CKD (eGFR), compare abnormal serum creatinine (eGFR) staging with other variables & determine speciality clinic referrals (Diabetic and nephrology).

A. Study Methods:

Study type: Retrospective single centre observational study

Sample size: All patients visited from 1/6/2023 to 31/5/2024 fulfilling with inclusion and exclusion criteria. We conducted Hatta hospital registry.

Inclusion criteria: all adult patients ≥ 18 years visiting the Hatta hospital from June 2023 to May 2024 and underwent renal function test such as; Serum creatinine (eGFR) and/or ACR (urine microalbumin or albumin creatinine ration).

Exclusion criteria: Pregnant patient, Incomplete laboratory works up & normal renal function test.

Definitions: Chronic kidney disease (CKD) is defined as: Abnormalities of kidney structure or function presented for a minimum of 3 months;

a. CKD Staging:

- G 1: eGFR > 90
- G 2: eGFR 60—89
- G 3a: eGFR 45—59
- G 3b: eGFR 30—44
- G 4: eGFR < 30
- G5: eGFR < 15 or on dialysis (ESRD)

b. Proteinuria: Albumin creatinine ratio (ACR) or urine microalbumin

- A1: < 30 mg/g
- A2: 30—300 mg/g
- A3: > 300 mg/g

Data collection procedure: Patient's data extracted through hospital electronic medical record system from June 2023 to May 2024. Demographic data such as Age, gender, nationality. Patient's data such as hospital visit date, reason for visit, department visited (emergency / ER, outpatient department / OPD, inpatient), blood pressure, body mass index (BMI), chronic diseases such as diabetes mellitus (DM), hypertension (HTN), chronic kidney disease (CKD), dyslipidaemia (DL), benign prostate hyperplasia (BPH), renal stone etc. Laboratory data such as serum creatinine (eGFR) current test, previous and repeat test status, urine proteinuria (urine routine, albumin creatinine ratio), renal imaging such as ultrasound KUB and/or CT scan KUB. Referral to nephrology and diabetic clinic.

Data analysis: Data was double entered and analysed in SPSS version 23. Mean and standard deviation for continuous variables (age) was calculated. Percentages or proportions for categorical variables such as gender, nationality, visit status, BMI, blood pressure, reason of visit, comorbid conditions, serum creatinine & eGFR, ACR, urine routine, imaging and speciality clinic referral. Association of current eGFR staging with other variables were calculated and p-value of < 0.05 was considered as statistically significant.

II. Results:

Total 405 files were reviewed after exclusion and including criteria. Out of these 79% were male and 21% females. UAE nationals were more 56% followed by Omani 15% and other expats 29%. OPD was most common area of visit 47% followed by ER 44% and inpatient 9%. Most cases visited for routine laboratory workup in 28% followed by genitourinary problems 18%, respiratory 14%, GIT 13% etc. Among chronic diseases; Known HTN 44%, dyslipidaemia 41%, DM 40%, known CKD 30%, kidney stone 15%, other cardiac diseases 14% and BPH 10% where as 36% were obese. Among abnormal serum creatinine (eGFR); Stage 2 was most common in 59%, stage 3a (22%), stage 3b (8%), stage 4 (4%) & stage 5 (3%). In previous serum creatinine (eGFR) status; stage 2 found in 32% and stage 1 in 30%. Repeat creatinine (eGFR); test not checked in 38%, while stage 1 (13%), stage 2 (28%), stage 3a (12%), stage 3b (4%), stage 4 (3%) & stage 5 (2%). Urine microalbumin A2 was found in 15% and A3 12%. Urine routine test proteinuria was found in 13%, haematuria 5% and both 3%. Renal imaging was normal in 12%, kidney stone 11%, nephropathy 5% & BPH 3%. Diabetic clinic referral was found 18% and nephrology clinic in 15% of cases. Current serum creatine (eGFR) compared with other variables. Stage 2 was common in younger age group; 18—40 years 126 (31%) & 41—59 years 100 (25%) & while stage 3a was common in 60 years and above 64 (16%) cases. Stage 2 common in males 231 (57%) while stage 3a in females 35 (9%). Stage 3a was common in chronic diseases such as HTN 70 (17%, p value 0.000), dyslipidaemia 65 (16%, p value 0.000), DM 53 (13%, p value 0.000) & BPH 21 (5%, p value 0.06). Abnormal ACR was commonly found in stage 3a (9% p value 0.03).

Table 1: Frequency of Variables

Variables	Description	No.	%	Variables	Description	No.	%
Age	18-40	146	36	Comorbid conditions	HTN	180	44
	41-59	137	34		DL	166	41
	≥60 years	122	30		DM	135	33
Gender	Male	320	79		CKD	120	30
	Female	85	21		Renal stone	59	15
Nationality	UAE	228	56		Cardiac disease	55	14
	Oman	62	15		BPH	40	10
	Expat	115	29		Renal transplant	11	3
Visit area	OPD	191	47	Urine microalbumin	No data	244	60
	ER	177	44		<30	53	13
	IP	37	9		30--300	60	15
Visit Date	2024	259	64		>300	48	12
	2023	142	35	Urine routine	No data	147	36
	≤2022	4	1		Normal	144	36
Visit reason	Respiratory diseases	56	14		Proteinuria	54	13
	GI problems	53	13		Hematuria	20	5
	GU problems	74	18		Hematuria & proteinuria	11	3
	Musculoskeletal	37	9		UTI	29	7
	Asymptomatic visits	113	28	Renal imaging	No data	262	65
	Acute emergencies	50	12		Normal	51	12
	Others	22	6		Renal stone	45	11
High Blood pressure	Yes	100	25		BPH	11	3
BMI	Normal	96	24		nephropathy	19	5
	overweight	162	40	Specialty consultation	Others	17	4
	Obese	147	36		Diabetic visit	73	18
					Nephrology visit	62	15

Table 2: Serum Creatinine test

Serum Creatinine	No data	≤1.2	1.21-1.5	1.51-2	>2
Previous test	77 (19%)	232 (57%)	54 (13%)	18 (5%)	24 (6%)
Current test	-	53 (13%)	279 (69%)	43 (11%)	30 (7%)
Repeat test	152 (38%)	139 (34%)	70 (17%)	25 (6%)	19 (5%)

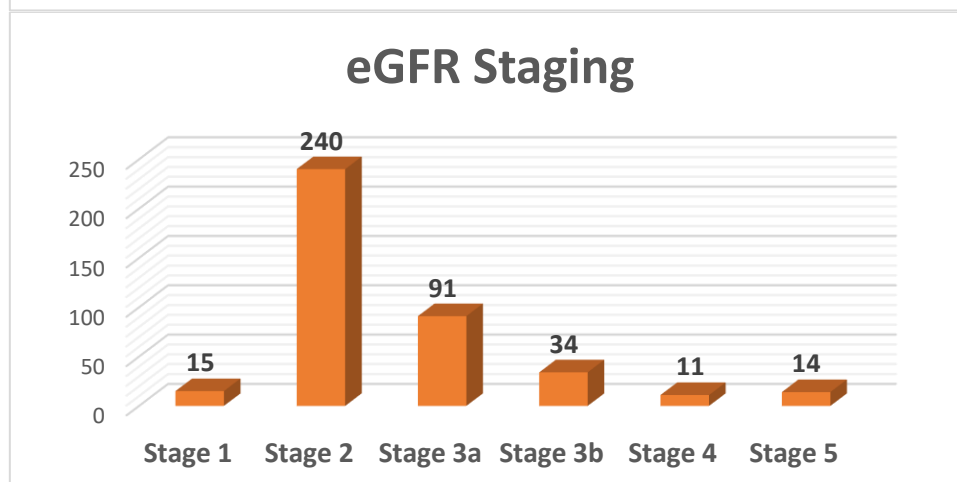
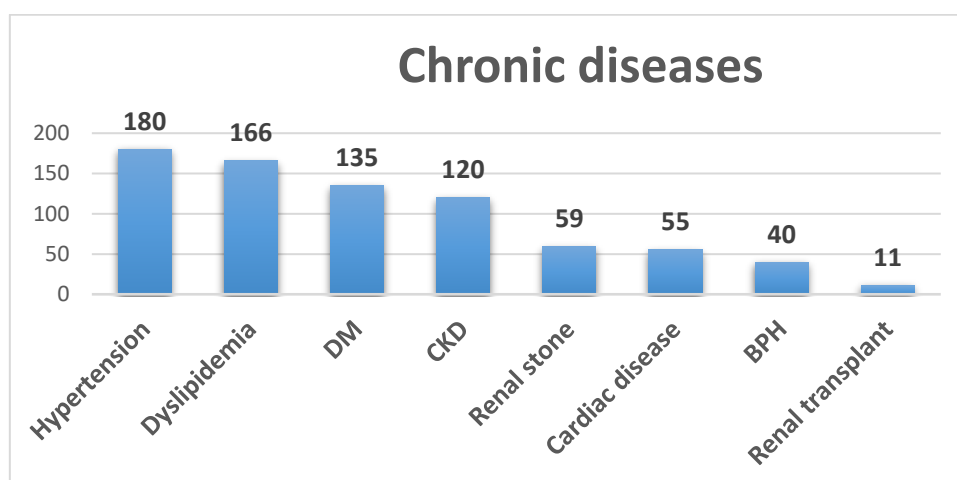
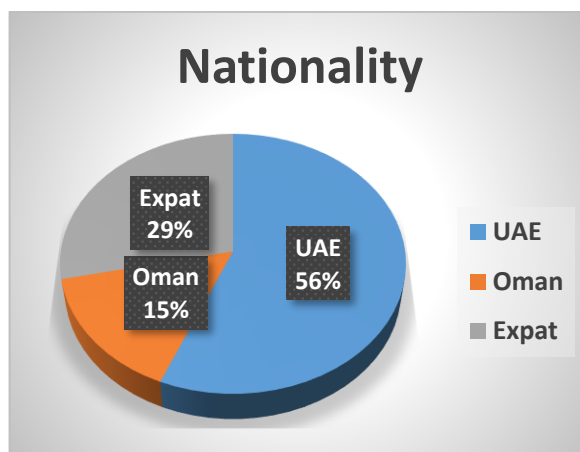
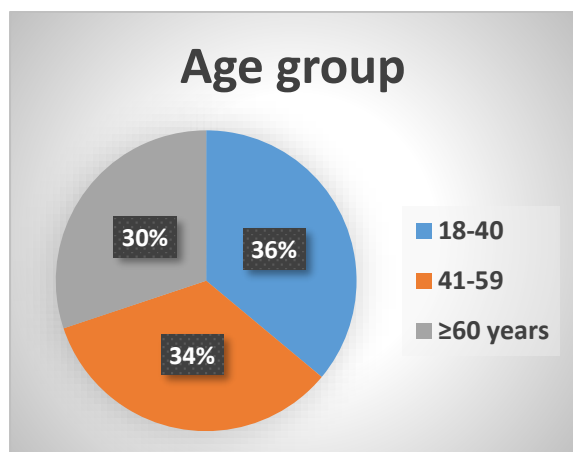
Table 3: eGFR test

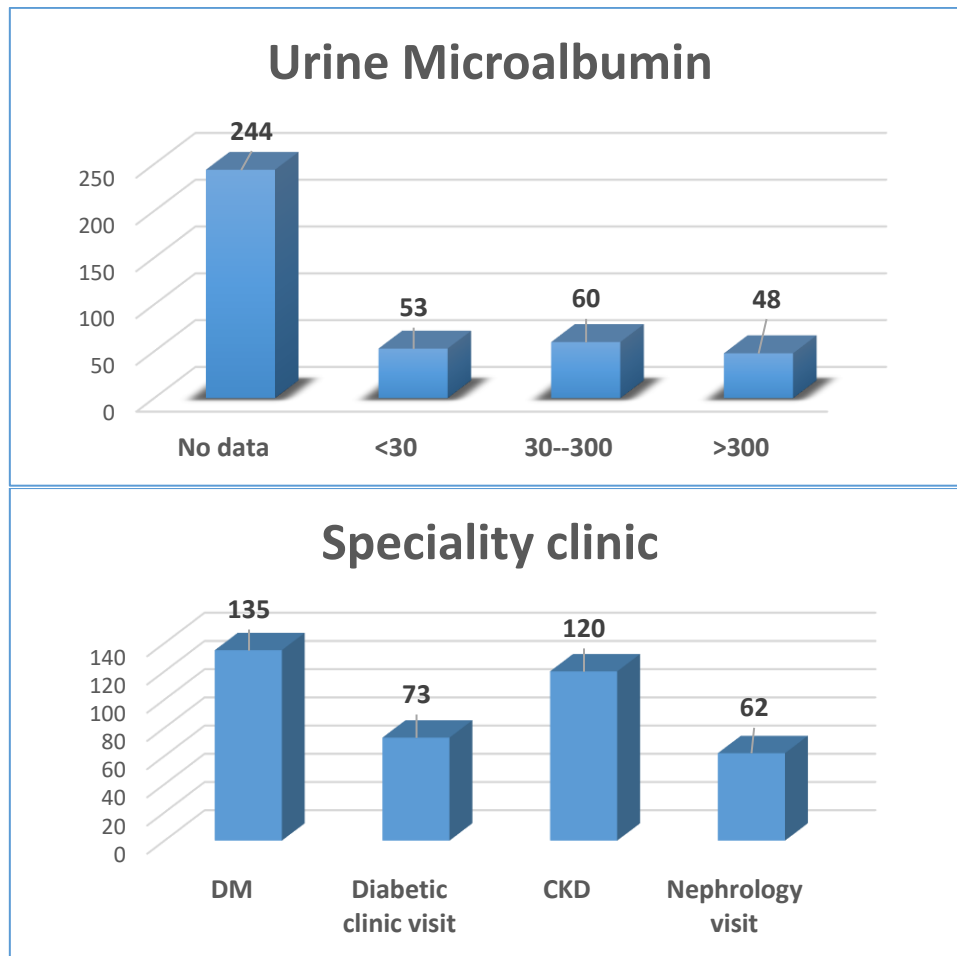
eGFR	No Data	Stage 1	Stage 2	Stage 3a	Stage 3b	Stage 4	Stage 5
Previous test	77 (19%)	122 (30%)	129 (32%)	39 (9%)	19 (5%)	11 (3%)	8 (2%)
Current test	-	4%	59%	22%	8%	3%	4%
Repeated test	152 (38%)	54 (13%)	114 (28%)	48 (12%)	17 (4%)	11 (3%)	9 (2%)

Table 4: Compare current eGFR with other variables

Current eGFR staging		Stage 1	Stage 2	Stage 3a	Stage 3b	Stage 4	Stage 5
Age	18-40 years	4	126	9	3	1	3
	41-59 years	10	100	18	2	3	4
	≥60 years	1	14	64	29	7	7
Gender	Male	5	231	56	14	4	10
	Female	10	9	35	20	7	4

Nationality	UAE	8	109	67	29	8	7
	Oman	5	34	14	3	2	4
	Other Expats	2	97	10	2	1	3
BMI	Overweight	8	99	32	13	4	6
	Obesity	4	94	31	11	3	4
HTN	Yes	8	51	70	31	9	11
DL	Yes	9	50	65	27	7	8
DM	Yes	8	35	53	26	5	8
CKD	Yes	5	18	44	32	10	11
Renal stone	Yes	1	40	12	3	1	2
Cardiac D	Yes	0	9	25	13	3	5
BPH	Yes	0	10	21	4	2	3
Renal transplant	Yes	2	4	2	3	0	0
Serum creatinine	≤1.2	15	20	18	0	0	0
	1.21-1.5	0	215	51	13	0	0
	1.51-2	0	5	22	15	1	0
	>2	0	0	0	6	10	14
Urine microalbumin	No data	0	202	35	3	1	3
	<30	1	21	19	11	1	0
	30-300	8	12	28	9	3	0
	>300	6	5	9	11	6	11
Urine routine	No data	2	110	29	2	1	3
	Normal	6	81	41	12	3	1
	Proteinuria	6	12	14	11	4	7
	hematuria	0	18	1	1	0	0
	UTI	0	14	5	6	2	2
Renal Imaging	No data	6	175	56	17	4	4
	Normal	7	20	15	8	0	1
	Renal stone	0	33	9	2	0	1
	BPH	0	2	7	0	0	2
	Nephropathy	2	4	0	4	4	5
Nephrology visit	Yes	7	10	15	14	8	8
Diabetic visit	Yes	5	23	27	11	2	5





III. Discussion:

In our study of 405 patients with abnormal renal function either as low eGFR and or abnormal ACR, Stage 3a was common in chronic diseases such as in with HTN 70 (17%), dyslipidaemia 65 (16%), DM 53 (13%) & BPH 21 (5%). Abnormal ACR was commonly found in stage 3a (28 cases in A2 & 9 cases of A3). Results of our study are comparable to studies with low eGFR and associated diseases.

A significant association between hypertension and the prevalence of CKD was also reported in a meta-analysis that included 75 global studies [11]. The association between diabetes mellitus and the prevalence of CKD was also reported in a meta-analysis that included 82 global studies. In a study from Uganda among diabetics, those with low eGFR, a significant proportion, 54% fell under the category of advanced CKD, KDIGO G-stage $\geq$ G3b with 2% falling under stage 5 (End Stage Kidney Disease, ESKD). Similarly, for those with proteinuria, a significant proportion, 25%, had severe albuminuria (stage A-3) of CKD [12]. Prevalence of CKD stages 3–5 in Abu Dhabi was 2.8% in females and 4.6% in males [13]. In another population of over 5000 individuals of India there was strong correlation as patients with HTN and diabetes were associated with low eGFR.

IV. Conclusion:

The prevalence of low eGFR and proteinuria among adult patients is quite high compared to the global and national prevalence of CKD in the general population. This remains a threat to the life span as well as the quality of life of these patients, yet only a handful of these patients are aware of their impaired kidney functioning as being asymptomatic. The other key observation drawn from our study is that a significant proportion of Hypertensive and diabetic patients had markers of kidney disease. We therefore recommend that; screening for CKD, among adults specially patients with HTN and diabetes should be readily incorporated into the routine care package with periodic screening and follow ups and intervened at the early abnormal findings in the tests.

References:

- [1]. Global, regional, and national burden of chronic kidney disease, 1990–2017: a systematic analysis for the Global Burden of Disease Study 2017. *Lancet* 2020; 395: 709–33
- [2]. Shiferaw F, Letebo M, Misganaw A, Feleke Y, Gelibo T, Getachew T, et al. non-communicable diseases in Ethiopia: disease burden, gaps in health care delivery and strategic directions. *Ethiop J Health Dev.* (2018) 32:3.
- [3]. Kyle J Foreman, Neal Marquez, Andrew Dolgert, Kai Fukutaki, Nancy Fullman, Madeline McGaughey et al. Forecasting life expectancy, years of life lost, and all-cause and cause-specific mortality for 250 causes of death: reference and alternative scenarios for 2016–40 for 195 countries and territories. *Lancet* 2018; 392: 2052–90
- [4]. Anna Francis, Meera N. Harhay, Albert C. M. Ong, Sri Lekha Tummalapalli, Alberto Ortiz, Agnes B. Fogo et al. chronic kidney disease and the global public health agenda: an international consensus. *Nature Reviews Nephrology* | Volume 20 | July 2024 | 473–485. <https://doi.org/10.1038/s41581-024-00820-6>
- [5]. The major global burden of chronic kidney disease. Vol 12 March 2024. www.thelancet.com/lancetgh
- [6]. Katherine T. Mills, Yu Xu, Weidong Zhang, Joshua D. Bundy, Chung-Shiuan Chen, Tanika N. Kelly et al. A systematic analysis of worldwide population-based data on the global burden of chronic kidney disease in 2010. *Kidney International* (2015) 88, 950–957.
- [7]. Csaba P. Kovesdy. Epidemiology of chronic kidney disease: an update 2022. *Kidney International Supplements* (2022) 12, 7–11
- [8]. Nathan R. Hill, Samuel T. Fatoba, Jason L. Oke, Jennifer A. Hirst, Daniel S. Lasserson, Christopher A. O’Callaghan et al. Global Prevalence of Chronic Kidney Disease – A Systematic Review and Meta-Analysis. *PLOS ONE* | DOI: 10.1371/journal.pone.0158765.
- [9]. Saeed Al-Ghamdi, Ali Abu-Alfa, Turki Alotaibi, Ali AlSaaidi, Abdulkareem AlSuwaida, Mustafa Arici et al. Chronic Kidney Disease Management in the Middle East and Africa: Concerns, Challenges, and Novel Approaches. *International Journal of Nephrology and Renovascular Disease* 2023;16 103–112
- [10]. Sabine Karam, Atefeh Amouzegar, Iman Rashed Alshamsi, Saeed M.G. Al Ghamdi, Siddiq Anwar, Mohammad Ghnaimat et al. Capacity for the management of kidney failure in the International Society of Nephrology Middle East region: report from the 2023 ISN Global Kidney Health Atlas (ISN-GKHA). *Kidney International Supplements* (2024) 13, 57–70.
- [11]. Hill NR, Fatoba ST, Oke JL, et al. Global prevalence of chronic kidney disease -a systematic review and meta-analysis. *PLoS One.* 2016;11: e0158765.)
- [12]. Low estimated glomerular filtration rate and proteinuria among adult diabetic patients in a tertiary hospital in Eastern Uganda - a cross-sectional study. Moses Kirya et al- *BMC Nephrol* 2024 Sep 27;25(1): 319.doi: 10.1186/s12882-024-03764-y)
- [13]. Richards N, Hassan M, Saleh AK, et al. Epidemiology and referral patterns of patients with chronic kidney disease in the Emirate of Abu Dhabi., *Saudi J Kidney Dis Transpl.* 2015; 26:1028–1034. doi:10.4103/1319-2442.1646005).