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Awareness, Attitudes, and Screening Practices for Chronic Kidney Disease Among Adults with Hypertension and/or Type 2 Diabetes in Primary Care

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Abstract: In most cases, chronic kidney disease (CKD) will not have any symptoms, and for individuals with hypertension and type 2 diabetes, risk recognition and early detection are both important components of primary care. The aim of the present work was to evaluate the level of knowledge, attitudes, screening behaviours, perceived barriers and primary-care support towards the management of CKD in 912 adults with hypertension and/or type 2 diabetes in Tripoli, Libya, using a cross-sectional questionnaire study. The 25 problem statements were analyzed at item level with 5-point Likert type responses. Often or always in terms of screening was considered frequent screening, and blood-based kidney-function testing as well as urine protein/albumin testing were considered comprehensive screening. Chi square tests and multivariable logistic regression were used to look at associations. Awareness was high: 99.3% of the respondents knew that hypertension and type 2 diabetes are risk factors for CKD, 97.4% knew that CKD can be asymptomatic and 98.0% indicated that they would like to be screened, even if they are feeling good. The frequency of reporting blood kidney-function testing was reported as often/always by 92.1%, and as often/always by 94.1% for urine protein/albumin testing; and 86.8% for both. Rarely did perceived barriers exist, and provider education and communication were rated as favourable. Male sex (adjusted odds ratio [AOR] 0.34, 95% confidence interval [CI] 0.21-0.55) and reported family history of kidney disease (AOR 0.45, 95% CI 0.29-0.71) were independently associated with decreased odds of comprehensive screening. These results highlight a very engaged primary-care population and significant sub-group differences that could be targeted for further risk-specific follow-up and ongoing kidney-health education.

Keywords: Chronic kidney disease, Hypertension, Type 2 diabetes, Primary care, Screening, Awareness.

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INTRODUCTION

Chronic kidney disease (CKD) has moved from being viewed mainly as a late-stage renal problem to being recognized as a major non-communicable disease with cardiovascular, metabolic, and health-system consequences. The analysis of Global Burden of Disease 2023 found an estimate of 788 million adults were living with CKD worldwide in 2023, approaching an age-standardized prevalence rate of 14.2%. In addition; within Libya and adjacent countries in North Africa and the Middle East there is the highest regional prevalence rate of approximately 18.0%. CKD ranks the ninth among global leading causes of death, and contributed substantially to cardiovascular mortality [1]. This growing burden has prompted international nephrology organizations to frame kidney disease as a public-health priority in which prevention and early detection must occur before irreversible loss of kidney function becomes clinically obvious [2].

The clinical challenge is that early CKD is frequently silent. Patients can remain asymptomatic while albuminuria or a fall in the estimated glomerular filtration rate (eGFR) are already recognized to have a substantially higher risk of renal failure, cardiovascular events, and mortality. The Kidney Disease: Improving Global Outcomes (KDIGO) guideline of 2024 therefore emphasizes evaluation with both glomerular filtration and albuminuria, rather than relying on symptoms or serum creatinine alone [3]. For those with type 2 diabetes mellitus (T2DM), current American Diabetes Association recommendations call for periodic assessment of urinary albumin and eGFR, with screening beginning at diagnosis of T2DM and continuing at least annually [4]. The joint American Diabetes Association-KDIGO consensus likewise positions systematic kidney assessment as a core component of integrated diabetes care because detection changes risk stratification and creates opportunities for kidney- and cardiovascular-protective treatment [5].

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The setting of this prevention pathway should be primary care. Some of the most common chronic conditions for which family physicians provide long-term care include hypertension (HTN) and T2DM, which are important risk factors for CKD. Although, as noted, a significant fraction of people with the condition of CKD may be missed by screening, a recent systematic review showed that risk factor based screening in primary care is relevant and can identify a significant proportion of people with previously undiagnosed CKD, especially in adults with diabetes, hypertension, cardiovascular disease and other known risk factors [6]. However, implementation in routine practice has not been uniform. Even in the context of established hypertension or diabetes, however, there remains some limited use of UACR in Canada, with greater rates of occasional testing over five years, but the prevalence of UACR testing remains low (<13%) [7,8]. US data also show that UACR testing is largely underused in people at risk of CKD [9].

Guideline availability does not explain why screening does (or does not) occur. Knowledge about CKD, including perceived risk, high preference for early detection, and the perceived link between diabetes or hypertension and kidney health, may be key factors in facilitating the shift from awareness to action. Thus, methodological literature on awareness instruments measuring the Knowledge, Attitude, and Practice on CKD in developing countries underscored the need for measuring these domains separately, rather than as a single binary concept [13]. In a large population in Mexico who were at high risk for developing CKD, due to diabetes or hypertension, the knowledge was also incomplete [11,12]. The same was true for primary care studies recently conducted in Türkiye, where the awareness was found to be variable even among individuals who already participated in health services [10].

The regional context makes this issue especially important. In neighboring Egypt, CKD was identified in approximately one third of hypertensive non-diabetic adults attending primary health-care centres, illustrating the amount of clinically relevant kidney disease that can be present within routine chronic-disease care [14]. Libyan evidence is much more limited and has historically focused on advanced disease; an earlier national analysis of dialysis-treated end-stage kidney disease documented a substantial burden and highlighted diabetes and hypertension among important etiologic contributors [15]. However, far less is known about how adults at risk of CKD in contemporary Libyan primary care understand that risk, whether they report receiving the recommended blood and urine tests, what barriers they perceive, and how effectively kidney-health messages are being communicated during routine follow-up.

Accordingly, the present study investigated CKD awareness, attitudes, self-reported screening practices, perceived barriers, and primary-care education and support among adults with hypertension and/or T2DM in Tripoli, Libya. Beyond describing these domains, the analysis examined which patient characteristics were associated with comprehensive kidney screening. The study was designed to address a practical question for family medicine: whether high-risk patients are moving from awareness to guideline-relevant screening behavior, and which subgroups may still require targeted intervention.

MATERIALS AND METHODS

Study design and setting

A cross-sectional study was conducted in September 2025 by a questionnaire in adults visiting the primary-care services in Tripoli (Libya). The study was carried out in the subjects with diagnosed hypertension and/or T2DM as these are crucial population groups in terms of risk assessment of CKD. The resulting sample of questionnaires was 912 complete questionnaires. The sample size provides an approximate half-width of the 95% confidence interval of 3.2 percentage points and is sufficiently fine to estimate the major descriptive results.

Participants

Adults (aged 18 years or older) with a current diagnosis of hypertension, T2DM or both were eligible for the survey. The questionnaire did not ask for names or national identification numbers etc. of the individuals. All 912 completed responses for which the data was eligible for inclusion in the final analytical dataset are included here, and there were no missing values in the demographic, clinical or Likert scale items used for the current analysis.

Questionnaire and measures

A structured questionnaire was used to gather data directly applicable to primary care. Eight items captured demographic and clinical information, and 25 closed-ended items were distributed across five prespecified content domains, each containing five items: (1) CKD awareness and knowledge; (2) attitudes and perceived risk; (3) kidney screening practices; (4) barriers to kidney screening; and (5) primary-care education and support. The instrument was deliberately brief and multidimensional; accordingly, the five domains were treated as distinct clinical content areas rather than as a single unidimensional 25-item scale, and the primary interpretation remained at item level.

Items of knowledge, attitude, barrier, and support utilized a five-point Likert's style agreement scale ranging from strong disagreement (1) to strong agreement (5). The screening-practice items were rated according to a 5-point frequency scale ranging from 1 (denoting for never) and 5 (denoting always). Agree/Strongly Agree was categorized as favorable for knowledge, attitudes, and provider-support items;

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Often/Always, as frequent screening practices; and Strongly Disagree/Disagree, as a low perceived barrier. The last support item, would you like to receive more education about CKD, was read as a separate measure as reflecting educational need but not provider performance.

Outcome definition

The primary inferential result was all-inclusive kidney screening. Participants were considered comprehensively screened if they reported their blood-based kidney-function testing and urine protein/albumin testing as often or always. Because contemporary evaluation of CKD needs to focus on both filtration and albuminuria, this combined outcome was chosen as a secondary outcome, along with frequent blood testing and frequent urine testing separately.

Statistical analysis

Analyses were performed using an IBM SPSS Statistics version 32.0 compatible workflow. Categorical variables were summarized as frequencies and percentages, while Likert items were summarized using means, standard deviations, and clinically meaningful favourable-response percentages. Pearson's chi-square test was applied to examine associations between participant characteristics and comprehensive screening. The characteristics with p <0.25 were elected as predictors for multivariable binary logistic regression to estimate adjusted risk and independence of the effect on the comprehensive screening. Prespecified covariates were age, sex, education, diagnostic pattern, duration of diagnosis, and family history of CKD. Because the cohort was female predominant, sex was retained as an adjustment variable and interpreted cautiously rather than used for sex-stratified population inference. Adjusted odds ratios (aORs) with their 95% confidence intervals (CIs), and two-sided p values were reported. Internal consistency was examined separately within each five-item domain using Cronbach's alpha; a single 25-item alpha was not treated as evidence of unidimensional reliability because the questionnaire intentionally measured five distinct constructs and was analyzed at item level. Statistical significance was set at $p<0.05$.

Ethical considerations

The study was conducted with officially permitted access and each individual was given a free option to participate in questionnaire filling or declining to participate. The setting and approach ensured avoiding of any physical or emotional harm to the participants as well as any financial strain.

RESULTS

Participant profile

Of these, 912 questionnaires were completed and analysed. Most participants were women (84.2%), and 78.2% were aged 30-49 years. The 46.7% reported T2DM without hypertension, and 40.8% reported hypertension and T2DM. Chronic disease was common and endured for many years, with 54.6% having had it for 6-10 years and 27.6% for 11 or more years. Almost half of respondents (49.3%) did not know if kidney disease was present in their family, and 17.8% of them had a positive family history of kidney disease (Table 1).

Table 1. Demographic and clinical characteristics of participants (N=912)

Characteristic	Category	n	%
Age group	18-29 years	180	19.7
	30-39 years	336	36.8
	40-49 years	378	41.4
	50-59 years	18	2.0
Sex	Female	768	84.2
	Male	144	15.8
Marital status	Married	438	48.0
	Divorced/Widowed	426	46.7
	Single	48	5.3
Education	Primary or less	6	0.7
	Secondary	30	3.3
	Diploma	252	27.6
	University degree	420	46.1
	Postgraduate	204	22.4
Employment	Employed	54	5.9
	Self-employed	192	21.1
	Retired	426	46.7
	Unemployed/Household	240	26.3
Current diagnosis	Hypertension only	114	12.5
	T2DM only	426	46.7
	Both	372	40.8
Diagnosis duration	<1 year	30	3.3
	1-5 years	132	14.5

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	6-10 years	498	54.6
	>10 years	252	27.6
Family history of kidney disease	Yes	162	17.8
	No or unknown	750	82.2

The clinical profile demonstrated that this was a risk population, not a representative community sample, as it involved mainly middle adults with chronic exposure. Over two-thirds of responders had hypertension and/or diabetes for at least six years, making the question about the incorporation of kidney screening into chronic care follow-up more relevant.

CKD awareness and attitudes

The overall knowledge of the key relationship between CKD and various factors was very high. The overall response rates were 99.3% for hypertension being a risk factor for CKD, and 99.3% for T2DM being a risk factor. Also, the awareness of the possibility of CKD occurring without any clear symptoms was high (97.4%). Almost all respondents agreed that blood testing (98.7%) and urine testing (99.3%) should have a role to play in assessment of the kidney. Similarly, attitudes were positive: 98.0% would consent to screening for the kidney even if they felt healthy and 94.7% agreed that regular screening would help prevent serious complications (Table 2).

Table 2. CKD awareness, knowledge, and attitudes

Domain/item	Mean	SD	Favourable %
Knowledge: HTN increases CKD risk	4.32	0.48	99.3
Knowledge: T2DM increases CKD risk	4.61	0.50	99.3
Knowledge: CKD may be asymptomatic	4.32	0.52	97.4
Knowledge: blood tests assess kidney function	4.62	0.51	98.7
Knowledge: urine tests detect early kidney damage	4.43	0.51	99.3
Attitude: perceives personal CKD risk	4.26	0.49	97.4
Attitude: early detection is important	4.60	0.57	97.4
Attitude: willing to screen when well	4.39	0.53	98.0
Attitude: screening prevents serious complications	4.57	0.59	94.7
Attitude: kidney health is part of chronic-disease care	4.40	0.57	97.4

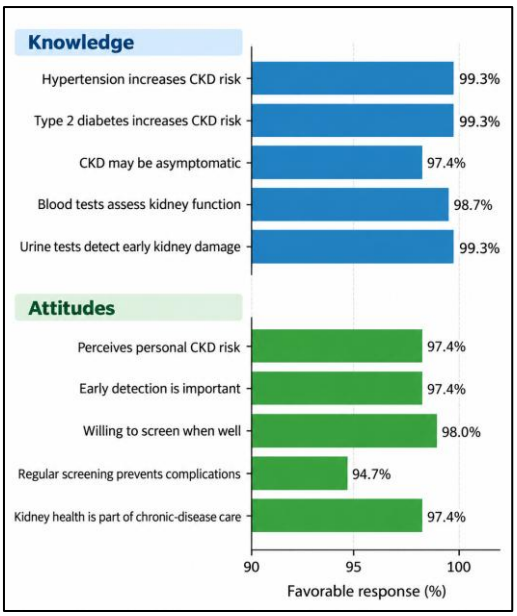


Figure 1. Favourable CKD awareness and attitudes among participants.

Figure 1 emphasizes the consistency of this pattern: favorable responses exceeded 94% across all ten knowledge and attitude items. The relatively narrow range suggests that the principal challenge in this sample was not basic recognition of kidney risk. Instead, the more informative question is whether this knowledge was translated into the two complementary tests needed to identify early kidney involvement.

Screening practices, barriers, and primary-care support

Self-reported kidney screening was also frequent. Regular chronic-disease follow-up was reported Often/Always by 96.7% of respondents. Blood-based

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kidney-function testing was reported Often/Always by 92.1%, urine protein/albumin testing by 94.1%, and discussion of kidney health with a health professional by 96.1%. When the two testing components were combined, 792 participants (86.8%) met the study definition of comprehensive screening (Table 3; Figure 2).

Table 3. Screening practices, perceived barriers, and primary-care support

Domain/item	Mean	SD	Key response %
Practice: regular follow-up	4.32	0.53	96.7 Often/Always
Practice: blood kidney-function testing	4.43	0.66	92.1 Often/Always
Practice: urine protein/albumin testing	4.36	0.61	94.1 Often/Always
Practice: discusses kidney health	4.49	0.60	96.1 Often/Always
Practice: follows kidney-protective advice	4.41	0.59	94.7 Often/Always
Barrier: no symptoms	1.09	0.40	98.7 low barrier
Barrier: not told when testing is needed	1.93	0.45	98.0 low barrier
Barrier: cost	1.17	0.54	97.4 low barrier
Barrier: time/clinic access	1.65	0.60	98.0 low barrier
Barrier: fear of abnormal result	1.37	0.56	99.3 low barrier
Support: provider explains kidney risk	4.38	0.49	100.0 Agree
Support: provider tells when screening is needed	4.59	0.49	100.0 Agree
Support: clear kidney-protection information	4.41	0.49	100.0 Agree
Support: able to ask kidney questions	4.62	0.51	98.7 Agree
Need: would benefit from more education	2.39	1.02	13.8 Agree

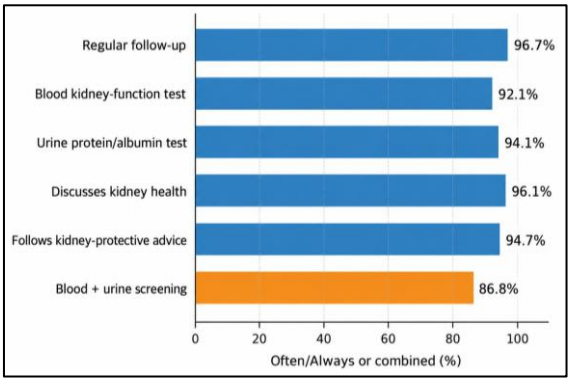


Figure 2. Frequency of self-reported kidney screening and related practices.

The overall result of all the individual screening practices was reported at a lower level than each of the individual screening practices was reported. This difference has some clinical significance as the patient can have repeated blood sampling and not have albuminuria included or the converse. This 86.8% comprehensive-screening rate is thus more conservative than either of the single test rates taken alone in the context of kidney surveillance.

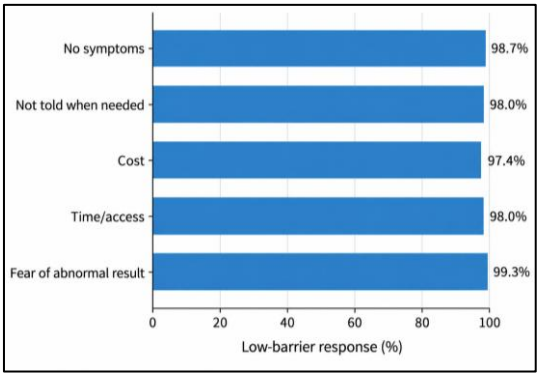


Figure 3. Participants reporting low perceived barriers to kidney screening.

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Perceived barriers were uncommon. At least 97.4% disagreed or strongly disagreed that absence of symptoms, lack of advice, cost, access/time constraints, or fear of an abnormal result would prevent screening. Provider communication was also rated strongly: the first three education/support items reached 100% agreement, and 98.7% felt able to ask questions about kidney disease. Nevertheless, 13.8% still agreed that they would benefit from additional CKD education, with a further 28.3% responding neutrally. This residual educational need is important because high average support does not mean that every patient feels fully informed.

Internal consistency of the questionnaire domains

Internal-consistency analysis supported item-level interpretation. The barriers domain showed the strongest coherence (Cronbach's alpha=0.687; standardized alpha=0.720), compatible with exploratory use of a short five-item domain. The remaining domains produced low or unstable coefficients, consistent with nonredundant content, restricted response variability, and marked ceiling effects. Therefore, no 25-item total score or domain sum scores were used in inferential analyses.

Factors associated with comprehensive screening

Comprehensive screening was found to be significantly different across various age groups (p=0.007), sex (p<0.001), marital status (p=0.026), employment (p<0.001), duration of diagnosis (p<0.001), and family history of kidney disease (p=0.001) in bivariate analyses. There was no significant relationship between education level and the combined screening outcome and between diagnostic category and the combined screening outcome. Among women, 89.1% had undergone screening, while 75.0% of men had had screening; among those who said that a member of their family had kidney disease, 77.8% said they had been screened, and 90.0% of those who said they did not have any family members with kidney disease had been screened (Table 4).

Table 4. Bivariate associations with comprehensive kidney screening

Characteristic (index category)	Among Often/Always screening *(n = 792)*	Among less frequent screening *(n = 120)*	Among total *(N = 912)*	*p*-value
Age ≥ 40 years	336 (42.4%)	60 (50.0%)	396 (43.4%)	0.119†
Male gender	108 (13.6%)	36 (30.0%)	144 (15.8%)	<0.001*
Married	378 (47.7%)	60 (50.0%)	438 (48.0%)	0.642
High education	540 (68.2%)	84 (70.0%)	624 (68.4%)	0.690
Unemployed	582 (73.5%)	84 (70.0%)	666 (73.0%)	0.423
Hypertension	432 (54.5%)	54 (45.0%)	486 (53.3%)	0.051**
Diabetes Mellitus	690 (87.1%)	108 (90.0%)	798 (87.5%)	0.374
Both comorbidities	330 (41.7%)	42 (35.0%)	372 (40.8%)	0.166†
Disease duration ≥ 6 years	653 (82.4%)	96 (80.0%)	749 (82.1%)	0.514
Family history of CKD	126 (15.9%)	36 (30.0%)	162 (17.8%)	<0.001*

n number of screening status subset, N the number of the study population, CKD = chronic kidney disease, * statistically significant (95% level of confidence), ** marginal statistical significance (95% level of confidence), † not statistically significant at 95% level of confidence but included in multivariate analysis.

The multivariable model was statistically significant (likelihood-ratio chi-square (6) =35.91, p<0.001). Because the model was specified to estimate adjusted associations rather than to function as a clinical prediction model, interpretation focused on AORs and 95% CIs rather than on pseudo-R-squared as a measure of predictive performance. After adjustment, male sex shows paradoxical independent prediction for higher odds of comprehensive screening, as well as the certain family history for CKD. Despite the opposite findings in bivariate analysis. This paradox was explained by further examining the association between gender and the reported family history where males tended to report statistically significant higher rate of family history than females do (25.0% vs. 16.4%, $p = 0.013$); showing skewness of family history around males. Age 40 years or older was not independently associated with the combined outcome (Table 5; Figure 4).

Table 5. Multivariable predictors of comprehensive kidney screening

Predictor	AOR	95% CI	*p*
Age ≥40 years	1.392	0.937	0.102
Male sex	2.997	1.881	<0.001*
Hypertension	0.452	0.225	0.025*
Both HTN + T2DM	1.390	0.683	0.364
Certain family history of kidney disease	2.047	1.312	0.002*

AOR= adjusted odds ratio, CI= confidence interval, HTN= hypertension, T2DM= type 2 diabetes mellitus

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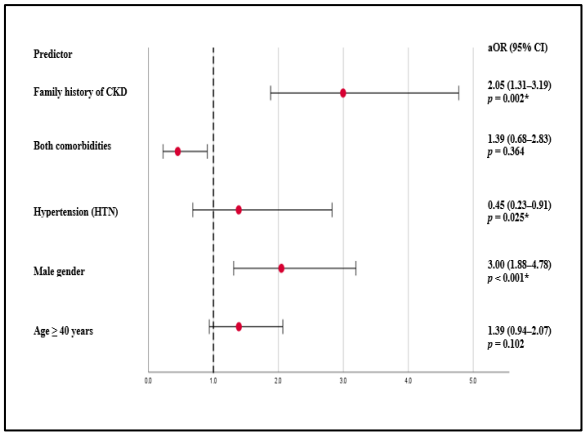


Figure 4. Adjusted odds ratios for comprehensive kidney screening. *p<0.05.
aOR= adjusted odds ratio, CI= confidence interval, HTN= hypertension, CKD= chronic kidney disease

The adjusted model was interpreted as an association model, not a clinical prediction tool. Significant estimates identify within-sample associations with incomplete paired blood-and-urine screening and do not establish causality.

DISCUSSION

Principal findings

The aim of this study was to present an up-to-date profile of awareness and self-reported screening practices among adults with hypertension and/or T2DM in Tripoli. Three findings are particularly important. First, recognition of the major CKD risk relationships and of the silent nature of early disease was very high. Second, reported screening engagement was also high: 92.1% of participants reported frequent blood kidney-function testing, 94.1% reported frequent urine protein/albumin testing, and 86.8% met the more stringent definition of comprehensive screening. Third, population averages did not eliminate clinically relevant subgroup signals: lower adjusted odds of comprehensive screening were observed for male participants and for those reporting a family history of kidney disease. Taken together, these findings suggest that the primary-care challenge in this setting is moving beyond broad awareness toward consistent completion of both screening components across all high-risk groups.

Awareness in a high-risk primary-care population

Comparing the knowledge results with international literature, the results are not in line with most of the texts. Unlike previous samples, the current sample had a high level of CKD awareness, with near universal recognition of hypertension and T2DM as risk factors for CKD, and very high awareness that CKD is often asymptomatic. A possible explanation is that there are multiple opportunities for education in this sample; 82.2% patients had experienced chronic-disease services more than 6 years and almost everyone reported receiving an explanation of the kidney effects of diabetes or hypertension.

Very high awareness is not synonymous with kidney-health literacy, however. The questionnaire was designed to assess a limited, specific range of key concepts, but not specific knowledge of CKD staging, eGFR interpretation, UACR thresholds, nephrotoxic drugs, and kidney protective pharmacotherapy. The key take-away from the present results is that the base message, 'Diabetes and hypertension can affect the kidneys even before there are any symptoms' is communicated successfully to the majority of respondents. Educational efforts in the future can then be based on that information to teach the meaning of the tests, the frequency of their use, and the impact of test results on treatment decisions.

Screening uptake and the gap between reported practice and global implementation

The most striking result is the high self-reported screening uptake. Internationally, albuminuria testing remains one of the weakest links in CKD detection. The recent meta-analysis by Albekery and colleagues concluded that only about one in five high-risk patients underwent quantitative UACR testing in routine clinical practice under the fixed-effect estimate, with extremely wide variation across health systems [7]. In a nationally representative Canadian primary-care cohort, only 13% of adults with diabetes received both eGFR and UACR testing annually, even though many received the tests less frequently over five years [8]. US analyses have likewise shown that albuminuria testing is substantially less common than clinically indicated [9]. Against that background, the 94.1% frequency of urine protein/albumin testing and 86.8% comprehensive screening reported here are unusually high.

Several factors may explain this difference without assuming that one health system is intrinsically superior to another. First, this study measured patient-reported frequency rather than extracting laboratory records, and participants may interpret any urine protein assessment as kidney screening. Second, the sample was drawn from adults already engaged with primary care and was dominated by people with long-standing diabetes and/or

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hypertension, conditions that often trigger repeated biochemical monitoring. Third, the questionnaire asked about usual practice rather than demanding documentation of a test within a fixed 12-month interval. These design features likely produce a broader estimate than studies that require laboratory-confirmed UACR and eGFR within a strict guideline window. The high percentages should therefore be interpreted as evidence of strong reported engagement, not as proof that every respondent received guideline-concordant quantitative UACR and eGFR testing.

Even with that caution, the pattern is encouraging because participants understood both blood and urine testing as part of kidney surveillance. This matters clinically. The AWARE-CKD in T2DM study found that gaps in patient and physician awareness can delay recognition, and more than half of participating patients with CKD were unaware of their diagnosis [16]. Other US work has described albuminuria testing as a missed opportunity even among insured adults already known to have CKD [17]. Contemporary reviews stress that UACR is not an optional adjunct to serum testing: albuminuria contributes independently to diagnosis, staging, prognosis, and treatment decisions [18,19]. Thus, maintaining a dual-test culture in primary care is more valuable than simply increasing the frequency of serum creatinine measurement.

Low perceived barriers and the role of primary-care communication

A unique finding of the current study is the extremely low score in perceived barriers to screening. At least 97.4% of all respondents failed to cite any of the following as a barrier: cost, absence of symptoms, time or access constraints, fear of abnormal results, lack of advice. This finding aligns with the parallel finding that provider communication was rated very highly. The psychological barrier that arises when a patient is told repeatedly why kidney tests are important and when to do tests is minimized. In this context, our findings suggest that counselling is not a thing apart from the screening process, but rather a form of explanation that is perceived as routine, normal, and part of diabetes and hypertension care rather than a procedure used solely to diagnose symptomatic disease.

However, there is a small, but significant, learning discrepancy. While the majority of respondents were satisfied with the information provided, 13.8% felt that more education on CKD would be beneficial and 28.3% were neutral. There was a noticeable perfect clinical compliance indicated by the 100.0% agreement on primary care doctors' support activity. Even after receiving good counselling, a patient may still wish for more information about the interpretation of tests, risk of progression, effects of medications, diet or when nephrology referral is required. This systematic review of the use of CKD screening programs highlights that initiation of screening is not a simple matter of ordering tests, as patient engagement, clinician knowledge, follow-up of abnormal outcomes, and linkage to treatment are all critical to the successful implementation of screening that improves outcomes, which means that education must be personalized to explain patient risk and results, moving away from general awareness.

Subgroup differences in comprehensive screening

Sex remained associated with comprehensive screening after adjustment, but this estimate should be interpreted within the composition of the present cohort. Because women constituted the large majority of respondents, the finding is best understood as a within-sample signal rather than a population-level estimate of a sex disparity in Libya. The observed association may reflect differences in attendance, preventive health-seeking, communication, test ordering, or recall, none of which can be separated by a cross-sectional questionnaire. The practical implication is therefore to ensure consistent paired blood- and urine-based screening for every high-risk patient rather than to infer a causal effect of sex.

This was more counterintuitive with the positive family history association. In spite of the fact that family history of kidney disease could be expected to lead to increased perceived risk, participants who reported a kidney disease in the family had lower adjusted odds for comprehensive screening. It is important to understand that this is an observational study and therefore should not be interpreted as a causal relationship. This could be attributable to differences in health-care use, socioeconomic factors, type of disease suffered by the relative being affected, or reaction to the situation. The right way to interpret the family history is not to assume that this makes screening unnecessary, but to assume that this makes it imperative to ask explicitly if both parts of the assessment of kidney disease have been conducted.

Implications for family medicine in Libya

The study is practical with regard to the role of family medicine in Libya. The screening for CKD may be incorporated into existing hypertension/diabetes visits rather than be a vertical program. There is systematic evidence to support risk factor-based screening in primary care6 and economic evaluations usually show that targeted screening is more cost-effective when targeted at populations of individuals at risk for diabetes or other risk factors [21,22]. Routine monitoring of long-term conditions also has broader economic and organizational implications, because testing schedules must be designed around feasible primary-care workflows rather than specialist services alone [23]. In a health system where advanced kidney disease creates substantial clinical and resource demands, strengthening early detection is likely to be more sustainable than relying on late referral after symptoms or marked renal impairment appear [15].

Meanwhile, the paper should not be interpreted as evidence of the rarity or control of CKD in Tripoli itself.

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The questionnaire did not assess laboratory-confirmed prevalence of CKD and/or stage of CKD, blood pressure control, glycemic control, or receipt of therapies known to protect the kidneys. Historical Libyan data show the impact when kidney disease reaches dialysis stages [15], and regional data show that clinically relevant CKD is not uncommon in those with hypertension in primary care [14]. The next step, then, is to correlate the "strengths" of behaviour identified here with objective clinical measurements, eGFR, UACR, blood pressure, glycated haemoglobin, medication adherence, and documented follow-up after abnormal results.

Strengths and limitations

The study has a number of strengths. It involved a large sample of 912 adults of a clinically relevant high-risk population, measured awareness and behaviour, rather than knowledge, and applied a composite screening endpoint that was appropriate for the dual nature of the CKD evaluation. The questionnaire was designed to be brief, and so was the analysis of the data, which resulted in broad descriptive findings being broken down into signals for each subgroup.

Several limitations should be considered. First, the cross-sectional design does not establish temporal or causal relationships. Second, screening practices were self-reported rather than verified against laboratory records, creating potential recall and social-desirability bias and possible over-reporting of favourable screening behavior. Third, the 25 questionnaire items represented five conceptually distinct content domains rather than a single psychometric scale. Internal-consistency diagnostics therefore supported item-level interpretation: the barriers domain showed the strongest reliability, whereas the other domains yielded low or unstable coefficients and were not converted into total scores. Fourth, the sample was predominantly female and consisted of adults already engaged in primary care; consequently, sex-specific estimates should be interpreted cautiously, and generalizability may be limited for men, people with infrequent health-care contact, rural populations, and those with undiagnosed hypertension or diabetes. Finally, the study did not measure actual eGFR, quantitative UACR, CKD stage, or use of renin-angiotensin system blockers, sodium-glucose cotransporter 2 inhibitors, finer none, and other kidney-protective therapies. These clinical variables should be incorporated into future prospective studies.

CONCLUSION

Adults with hypertension and/or T2DM in this Tripoli primary-care sample demonstrated high CKD awareness, favourable attitudes toward early detection, frequent self-reported blood and urine kidney testing, and low perceived screening barriers. Comprehensive screening was reported by 86.8% of participants. Within the adjusted association model, male sex and reported family history of kidney disease were associated with lower odds of receiving both screening components, although the sex estimate should be interpreted cautiously because of the female-predominant sample. The findings support maintaining routine CKD education within chronic-disease care while emphasizing completion of paired blood-and-urine assessment for all high-risk patients. Future studies should verify self-reported practices against eGFR and quantitative UACR records and determine whether high screening engagement translates into earlier CKD diagnosis and timely kidney-protective treatment.

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CONFLICTS OF INTEREST

None declared.

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ETHICS STATEMENT

There was no request for any personal information and informed consent was obtained prior to filling the questionnaires. This study relied exclusively on questionnaire data and no biological sampling, nor experiment with intervention.

AUTHOR CONTRIBUTION

Najat Alduwayb was responsible for study conception, questionnaire development, data interpretation, manuscript drafting, critical revision, and approval of the final manuscript. Waeil IT Kawafi was responsible for data analysis, data interpretation, manuscript drafting and appraisal and corrections.

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