Sys Rev Pharm 2020;11(7):475-481
A multifaceted review journal in the field of pharmacy

Knowledge, Attitudes, and Perceptions of Healthcare Professionals towards Early Referral and Using Statins in Non-dialysis CKD Patients

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ABSTRACT

The aim of this study is assessing Healthcare Professionals (HCPs) knowledge on Chronic Kidney Disease (CKD) and inspecting their attitude regarding referral and perceptions towards statins use in non-dialysis CKD patients. A cross-sectional design was employed using a self-administered questionnaire that was constructed and validated before the study. The questionnaire was distributed to HCPs at two accredited hospitals. A total of 187 individuals including, 48.1% were pharmacists, 40.6% were physicians, and 11.2% were medical students. Female respondents slightly exceeded males, 56.7% vs. 43.3% respectively. Thirty-nine percent of study participants chose medical journals as their fundamental source for updated CKD information. More than 87% of respondents reported that the available CKD Continuing Medical Education (CME) programs are not sufficient. Almost 93% of participants appreciated the benefit of early referral of CKD patients to a nephrologist and 84.5% believed that non-dialysis CKD patients might benefit from using statins. The overall knowledge of participants was average with no significant differences in overall knowledge scores based on their age, gender, profession, experience or monthly salary. In conclusion, HCPs hold a positive attitude towards the early referral of CKD patients to nephrologists and appreciate the considerable value of statins use in improving CKD patients' outcomes.

Keywords: Chronic Kidney, Referral, Knowledge, Perceptions, Statins , Attitudes.

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INTRODUCTION

Chronic kidney disease is a universal health issue [1] which constitutes a major share of the disease's encumbrance around the world [2]. The prevalence of CKD was predestined to be about 8-16% worldwide [3, 4]. In the Arab world, information on the prevalence of CKD and other kidney diseases is restricted. However, CKD risk factors like diabetes mellitus (DM), hypertension and obesity were found to be extremely dominant [5, 6]. In Saudi Arabia, the prevalence of CKD was 9.41% and 5.7 % in Hail and Riyadh respectively [7, 8]. Furthermore, The Saudi Center for Organ Transplantation (SCOT) notified a yearly raise in the incidence of End-Stage Renal Disease (ESRD) by 8% [9].

For prevailing the progress of CKD, many strategies have been suggested, for instance; Low protein diet [10] and blood pressure control [11]. The Kidney Disease Outcome Quality Initiative (K/DOQI) guidelines for CKD assessment, classification, and stratification developed by the National Kidney Foundation (NKF) in 2002 was not conclusive concerning the impact of lipid lowering therapy in the decreasing of GFR decline in CKD patients. However, the recent CKD practice guideline issued by KDIGO in 2013 obviously recommended statins for the majority of non-dialysis CKD patients [12, 13]. Statins display diverse pharmacokinetic profiles and should be prescribed in an individualized way in light of patient's status and CKD stage [11].

Suitable application of the available guidelines be highly prohibited by the insufficient knowledge, negative attitudes and/or wrong perceptions of HCPs. A research evaluating the awareness of Primary Care Physicians (PCPs) in the US on K/DOQI guidelines, documented a shortage of knowledge with K/DOQI guidelines, the assertiveness of common, less accurate diagnostic procedure, variability in the treatment of complications, and dout of timing of a referral to a nephrologist [14]. The case of uncertainty of the suitable referral time was also discovered in an identical research in Pakistan [15].

OBJECTIVE

In Saudi Arabia, there are, up to our knowledge, no published studies that assess the knowledge of HCPs regarding CKD, their attitude towards early referral of CKD patients to nephrologists, and their perceptions about the significance of using statins in non-dialysis CKD patients.

MATERIAL AND METHODS

Study design and setting

A cross-sectional survay was instructed and validated. The study targeted HCPs (physicians, pharmacists, and medical students) for the interval of three months at two accredited hospitals in Riyadh, Saudi Arabia. The sample size was calculated using Raosoft® software based on the following specifications: 5% acceptable margin of error, 95% confidence interval, a roughly estimated population size of HCPs of 300, and a response distribution of 50% [16]. The study approved by research committee at Security Force Hospital, Riyadh, Saudi Arabia.

Study participants

187 HCPs approved to response to the self-administered questionnaire. A written consent and a brief illustration of study objectives and the utilized tool were provided to participants by a trained one of the investigators. The participants were given 15 minutes to answer the questions; this interval was found to be enough depends on the pilot study implemented to validate the study tool.

Tool validity and reliability

The authors create the survey elements through a comprehensive literature review and based on the recent KDIGO clinical practice guideline for lipid management in CKD which is utilized as a reference for patients' management at the study sites [13]. The design of the first version of the scan was completed in two steps: content validity and reliability assessment. Three academic pharmacy professors and two clinical researchers with a good background assessed the validity of the content, the relevance and comprehensiveness of the survey elements. A pilot study was conducted on fifteen pharmacists and ten physicians. Reliability coefficient, Cronbach's alpha, was calculated and found to be 0.742 which is considered to be in the acceptable range (0.70 to 0.95). Pilot study results were not included in the final data analysis [17].

Instrument content and scoring

The tool of study consisted of 30 items and was divided into five sections. The first section scouted the sociodemographic data and the resources that the participants use to get updated information about CKD. The second section explored the participants' opinion about the adequacy of available CME programs, participant's attitude towards early referral of patients to a nephrologist, and their perceptions of statins use in CKD patients. The third, fourth and fifth sections evaluated the participants' knowledge regarding CKD in general, statins as a lipid-lowering therapy and statins use in CKD patients respectively. The third section comprised the definition, risk factors and complication of CKD, BP and HbA1c goals in CKD patients, and optimum time for referral of CKD patients to a nephrologist. The fourth section covered information relevant to statins' pharmacokinetics, efficacy, and adverse effects. The fifth (last) section encompassed clinical decision making on using statins in non-dialysis CKD patients. Knowledge was scored by giving 1 point to correct answer and zero points to incorrect one. We categorized the respondents' knowledge as follows: A knowledge score <40% is considered poor, 40% to 70% is considered average, and > 70% is considered good.

Data analysis

All the statistical calculation was done using the Statistical Package for Social Science (SPSS, v.22.0, Chicago, IL, U.S.A.). Descriptive statistics of continuous variables were reported as mean ± standard deviation, and categorical variables were summarized and reported as frequencies and percentages. Using Mann–Whitney U-test & Kruskal–Wallis test the continuous variables were compared. To find the relationship between the variables, Spearman's rank correlation was used. The level of statistical significance was set at P-value < 0.05.

RESULTS

Table 1 shows the general criteria of study participants. Out of the 187 participants who filled and returned the questionnaire, 90 (48.1%) were pharmacists, 76 (40.6%) were physicians (29 consultants and 47 specialists), and 21 (11.2%) were medical students. Female participants were slightly more than males, 56.7% vs. 43.3% respectively. The majority, 79.6%, of study participants were under 40-year old, while only 7% of them exceed 50-year of age. The years-of-experience of respondents ranged from < 5 years to > 10 years, with 35.8% of them had < 5 years of experience, 36.4% had 5-10 years of experience, and 27.8% had > 10 years of experience in medical practice.

Table 1. General characteristics of study participants

Characteristics	Participants (n)	(%)
Profession		
Consultant	29	15.5
Specialist	47	25.1
Medical student	21	11.2
Pharmacist	90	48.1
Gender		
Male	81	43.3
Female	106	56.7
Age		
<30	70	37.4
30-39	79	42.2
40-49	25	13.4
≥50	13	7.0
Experience		
< 5 years	67	35.8
5-10 years	68	36.4
> 10 years	52	27.8
Monthly income		
< 10000 SAR	49	26.2
10000-15000 SAR	86	46.0
> 15000 SAR	52	27.8

The leading source of updated information about CKD reported by participants was medical journals as illustrated in figure 1. Table 2 describes the participants' perceptions towards the adequacy of CME programs for renal failure that are offered to HCPs, the benefit of early referral of CKD patients to a nephrologist and the worthiness of using statins in CKD non-dialysis patients. A considerable portion, 87.7%, of study participants reported their dissatisfaction with the magnitude of available renal failure CME programs. The vast majority (92.5%) of respondents were for early referral of CKD patients to a nephrologist. The supporters of statins use in non-dialysis CKD patients were much more than opponents, 84.5% vs. 15.5% respectively.

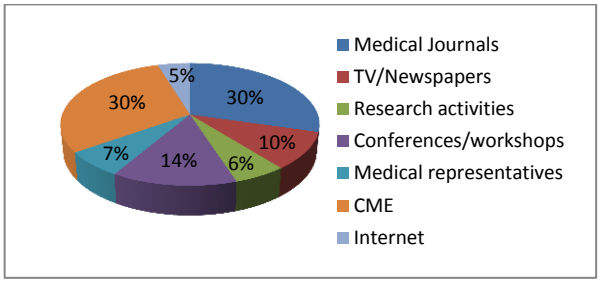

Figure 1: Sources of updated information about CKD

Table 2. Perception questions

Items	Yes	No
	N (%)	N (%)
Do you think that there are enough continuous medical education programs about renal failure for health care professionals?	23 (12.3)	164 (87.7)
Do you think that there are benefits from referring to a nephrologist from the early stages of CKD?	173 (92.5)	14 (7.5)
Do you think that there are benefits from using statins among CKD non-dialysis patients?	158 (84.5)	29 (15.5)

Tables 3 and 4 summarize the participants' performance in the three sections of knowledge assessment. Among the three knowledge sections, the second section (knowledge on statins) was relatively the poorest; where the percentage of right answers was 40.9% compared to 59.1% for the wrong ones. Furthermore, the proportions of the right to wrong answers of the first section (knowledge on CKD) and the third section (knowledge on statins use in CKD) were quite similar and higher than the second section, 54.8% to 45.2% and 56.6% to 43.4% respectively. The mean knowledge scores of participants based on their age, gender, profession, lengths of experience or monthly incomes were average in each of the knowledge sections separately and in the total mean scores for the three sections altogether. Moreover, there were no significant differences in the overall knowledge scores among participants based on the last mentioned specifications. However, male gender, older age, specialist physicians, longer experiences and highest salaries were consistently related to higher knowledge scores.

Male participants and professionals with monthly income of >15,000 Saudi Arabian Riyal (SAR) scored higher than their counterparts in the three knowledge sections and subsequently the total score. Higher knowledge scores were more also seen in participants with older age ranges; where participants >50 years got the highest scores in all knowledge sections except the first one which was owned by the preceding age group (40-49 years). Amongst different professionals who filled the questionnaire, specialist physicians managed to achieve highest overall score (10.85 ± 1.91) followed by consultants (10.41 ± 1.90), pharmacists (10.29 ± 1.93) and eventually medical students (9.96 ± 2.46).

Table 3. knowledge questions (right to wrong answers)

Knowledge about CKD	Correct answer	Incorrect answers
	N (%)	N (%)
Assessing renal function	97 (51.9)	90 (48.1)
Risk factors for CKD	141 (75.4)	46 (24.6)
CKD screening	118 (63.1)	69 (36.9)
CKD complications	88 (47.1)	99 (52.9)
Blood pressure goal in CKD diabetic patients	77 (41.2)	110 (58.8)
HbA1c goal in CKD diabetic patients	125 (66.8)	62 (33.2)
Optimum time for referral to a nephrologist	71 (38)	116 (62)
Total	717 (54.8)	592 (45.2)
Knowledge about statins		
Statins metabolism	86 (46)	101 (54)
Statins dose adjustment in CKD patients	86 (46)	101 (54)
Statins adverse events in CKD patients	49 (26.2)	138 (73.8)
Statins relative efficacy in lipid lowering	107 (57.2)	80 (42.8)
Statins in Kidney transplanted patients	54 (28.9)	133 (71.1)
Total	382 (40.9)	553 (59.1)
Knowledge about statins use in CKD		
Mechanism of renoprotective effect of statins	135 (72.2)	52 (27.8)
Statins use in CKD patients	50 (26.7)	137 (73.3)
Managing dyslipidemia in CKD, LDL level	45 (24.1)	142 (75.9)
Managing dyslipidemia in CKD, TG level	118 (63.1)	69 (36.9)
Managing dyslipidemia in CKD, Total cholesterol level	114 (61)	73 (39)
Integrated case scenario, initial intervention	84 (44.9)	103 (55.1)
Integrated case scenario, patient follow-up	141 (75.4)	46 (24.6)
Integrated case scenario, alternative/add-on intervention	160 (85.6)	27 (14.4)
Total	847 (56.6)	649 (43.4)

Table 4. knowledge questions (mean scores)

		Knowledge score (Mean ± SD)				P-values			
Criteria	**N**	**Sec3 (n=7)**	**Sec4 (n=5)**	**Sec5 (n=8)**	**Total**	Sec3	Sec4	Sec5	Total
Profession									
Consultant	29	3.72 ± 0.84	3.00 ± 1.36	3.69 ± 0.93	10.41 ± 1.90	0.49	0.83	0.04	0.69
Specialist	47	3.81 ± 0.88	3.13 ± 0.97	3.91 ± 0.97	10.85 ± 1.91				
Medical student	21	3.62 ± 0.74	2.76 ± 1.45	3.57 ± 1.63	9.96 ± 2.46				
Pharmacist	90	3.94 ± 1.00	3.06 ± 1.21	3.29 ± 1.14	10.29 ± 1.93				
Gender									
Male	81	3.91 ± 1.00	3.04 ± 1.23	3.62 ± 1.16	10.57 ± 2.27	0.38	0.85	0.39	0.23
Female	106	3.78 ± 0.89	3.03 ± 1.19	3.48 ± 1.16	10.29 ± 1.75				
Age									
<30	70	3.80 ± 0.93	2.80 ± 1.33	3.34 ± 1.33	9.94 ± 2.03	0.62	0.16	0.26	0.06
30-39	79	3.89 ± 0.98	3.15 ± 1.04	3.65 ± 1.06	10.67 ± 2.07				
40-49	25	3.92 ± 1.00	3.15 ± 1.04	3.52 ± 1.00	10.52 ± 1.58				
≥50	13	3.54 ± 0.66	3.46 ± 1.13	4.00 ± 0.91	11.00 ± 1.63				
Experience									
< 5 years	67	3.86 ± 0.95	2.81 ± 1.31	3.33 ± 1.35	10.00 ± 2.10	0.71	0.14	0.23	0.136
5-10 years	68	3.87 ± 0.98	3.12 ± 1.13	3.68 ± 1.03	10.66 ± 2.08				
> 10 years	52	3.77 ± 0.89	3.21 ± 1.14	3.63 ± 1.03	10.62 ± 1.65				
Monthly income									
< 10000 SAR	49	3.84 ± 0.96	2.80 ± 1.46	3.37 ± 1.52	10.00 ± 2.11	0.94	0.29	0.69	0.20
10000-15000 SAR	86	3.80 ± 0.92	3.07 ± 0.98	3.55 ± 1.01	10.42 ± 1.98				
> 15000 SAR	52	3.90 ± 0.96	3.20 ± 1.27	3.70 ± 0.98	10.79 ± 1.85				

Note: Section three mean score is out of 7(mean score ≤ 2.8 is considered poor, score >2.8 to 4.9 is considered average, and score >4.9 is considered good). Section 4 mean score is out of 5 (mean score ≤ 2 is considered poor, score >2 to 3.5 is considered average, and score >3.5 is considered good). Section 5 mean score is out of 8 (mean score ≤ 3.2 is considered poor, score >3.2 to 5.6 is considered average and score >5.6 is considered good. The total mean score is out of 20 (Total mean score ≤ 8 is considered poor, score >eight to14 is considered average and score >14 is considered good.

DISCUSSION

Updated guidelines provide substantial evidence-based props for the appropriate management of various clinical situations. However, the Knowledge, Attitudes, and Perceptions (KAPs) of HCPs remain to be the major pillars upon which guidelines implementation relies. Our study helps not only to identify the current KAPs of HCPs regarding some important yet controversial issues in clinical practice but also bolster and lead prospective educational interventions. The results of our study suggest that the available CKD CME programs are not sufficient and have an only minor contribution to the knowledge pool of HCPs. Furthermore, HCPs possess a favorable attitude towards the early referral of CKD patients to nephrologists and a positive perception in respect of the valuable role of statins in modulating CKD patients' outcomes. However, the average knowledge scores of HCPs revealed by our study presupposes imperative well-designed educational acts.

Our respondents reported that they mostly rely on medical journals for getting updated acquaintance about CKD. However, this result is not compliant with a study by Mahmud et al. (2016) conducted in Pakistan and in which participants chose textbooks as their primary references while medical journals and online articles were their least used information resources [18]. The difference might be attributed to the concept of the"global digital divide" which was described by Norris (2001) and according to which HCPs in developing countries like Pakistan may have inferior access to information and communication technologies (ICTs) compared to more developed ones like Saudi Arabia [19].

Our study illustrates that HCPs are not contented with the currently offered CKD CME programs, and this trend was supported by a low percentage of respondents who chose CME as their source of updated CKD information. This comes in concordance with Al-Mosilhi and Kurashi (2006) who partially justified this dissatisfaction by the unawareness of some of the HCPs with some or all of the available CME programs including the online/distance learning ones [20]. However, this does not omit the potential quantitative or qualitative imperfection of the currently presented CME programs.

Despite its established prominence [21-25], referral of CKD patients to nephrologists at their early stages is still not the norm [26,27]. However, our respondents seemed to have a clear-cut positive attitude towards early referral of patients to a nephrologist. However, unfortunately, this positive attitude might be greatly attenuated by the poor knowledge they have regarding this matter; as 62% of study respondents failed to identify the optimum referral time. Given their positive attitude, this poor knowledge may lead to either side of the suboptimal referral; earlier or later.

More than 84% of our respondents believed that statins might be a salutary add-on therapy in non-dialysis CKD patients. This comes in congruence with both, the latest KDIGO clinical practice guideline for lipid management in CKD and the Australian Kidney Foundation guidelines for identification, managements, and referral of CKD patients which recommend using statins for most of non-dialysis CKD patients. The high preference of our respondents towards medical journals as a source of updated information may have contributed to their up-to-date acquaintance.

Male participants managed to score higher than females in the three knowledge sections and in the same way respondents with highest salaries predominated highest scores. Saudi culture and rigorous recruitment criteria might have participated to these results. In Saudi community, males are more able to interact and socialize than females what makes them ,to some extent, more subjected to updated information [28]. Additionally, a considerable portion of HCPs in Saudi Arabia are expatriates who are neatly chosen and precisely paid, the thing that ensures that the highest paid professionals are, most probably, the most knowledgeable ones.

Age and years of experience showed to have positive, yet not statistically significant, impact on the participants' knowledge. Participants aged 40 years or older or had five or more years of experience managed to achieve highest scores in all knowledge sections. On the other hand, respondents who were younger than 30 years or had less than five of experience consistently had the lowest knowledge mean scores. These results are harmonious with the logic expectations; as in medical practice, in most of the cases, older HCPs with more years of experience usually tend to know more than their juniors.

Profession-wise, as expected, medical students scored least, followed by pharmacists. However, paradoxically, specialist physicians scored higher than consultants. The later might be substantiated by the greater eagerness and enthusiasm they have towards acquiring new information. Moreover, specialists tend to be more flexible or less resistant towards changing their practice based on new updates than consultants who would prefer to stick to their long-standing experience.

Our study results should be explicated in light of some limitations like cross-sectional study design and self-reporting bias that might limit the generalizability of the findings. Nevertheless, our findings provide fruitful and relatively novel information regarding HCPs knowledge, attitude, and perceptions towards some controversial issues in nephrology practice. Further work, to design and test the effectiveness of CME programs that cover the disclosed gaps in HCPs knowledge, attitudes and perceptions, is warranted.

CONCLUSION

HCPs' knowledge regarding CKD, statins and statins' use in CKD is average. There is room for improving HCPs' awareness in these areas, especially statins' pharmacokinetics, efficacy and adverse effects. The majority of HCPs hold a favorable attitude towards early referral of CKD patients to nephrologists. However, they are still confused regarding the optimum time for patients' referral. Most of the HCPs believe that statins have a significant role in modulating CKD patients' prognosis. HCPs can have a paramount role in restraining CKD progression, and precluding its related

complications through an increased familiarity with updated guidelines.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

The study protocol conformed to the ethical guidelines of the 1975 Helsinki Declaration and the approval was obtained from ethical committee of Middle East University-Amman-Jordan.

ACKNOWLEDGMENT

The authors are grateful to the Middle East University, Amman, Jordan for the financial support granted to cover the publication fee of this research article.

CONFLICT OF INTEREST

There are no conflicts of interest.

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