Original Article

IMPACT OF PHARMACIST LED INTERVENTION IN IMPROVING MEDICATION KNOWLEDGE AMONG CHRONIC KIDNEY DISEASE PATIENTS: A PRELIMINARY STUDY

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ABSTRACT

Objective: This study aims to evaluate the impact of pharmacist-led medication management clinics in improving medication knowledge among chronic kidney disease (CKD) patients.

Methods: This was a retrospective study using a convenient sampling method. All CKD patients age 18 y above with complete pre and post knowledge assessment record were included. The pre-knowledge assessment was done at baseline while the post-assessment was done after a few sessions of medication knowledge teaching done by the clinical pharmacist using medication knowledge assessment form. Demographics data and pre-post knowledge scores were retrieved from patient's electronic medical record system. All data were analysed using the Statistical Package for Social Sciences (SPSS) version 24.

Results: The study shows a total of 13 patients, with the majority being Malay, male with a median age of 60. 84.6% of the patients were consuming more than 5 medications. While 53.9% of patients fall into CKD stage 4 and 5. Patient's knowledge towards medications improved significantly with an increase in the median pre-knowledge score of 13 to post knowledge score of 18 ($p<0.05$) after completion of the session.

Conclusion: From this preliminary evaluation, pharmacist-led medication management clinic resulted in significant improvement of medication knowledge which is further expected to improve medication adherence and delay the disease progression

Keywords: Chronic kidney disease, Pharmacist, Knowledge

INTRODUCTION

Chronic kidney disease (CKD) is an alarming concern worldwide with high economic cost to the health system and are associated with increased risk of cardiovascular morbidity, premature mortality and decreased quality of life. Furthermore, due to the nature of the disease, it is usually asymptomatic until a later stage [1]. Global Burden of Disease Study in 2015 stated that kidney disease was the 12th most common cause of death, with almost 1.1 million deaths worldwide [2]. Patients with CKD often received a complex medication regime with a high number of prescribed medications. Patient with CKD received an average of 12-19 prescribed medications with more than 30% of patients have shown non-adherence to medications which result in poor treatment outcome and conclude that lack of medication knowledge with regards to the complex medication regimen and the desired treatment outcome was the main cause of this issue [3].

The awareness and knowledge of CKD is crucial for patient involvement and adherence to the treatment, but CKD awareness assessed in primary care was found to be low even among kidney patients compared to awareness of diabetes and hypertension [4]. Pharmacist-managed clinic in Malaysia known as the medication therapy adherence clinic (MTAC) was introduced as part of the clinical pharmacy services to improve the quality, safety and cost-effectiveness of patient care. Thus, in order to promote adherence and medication knowledge among CKD patients, pharmacy activities in outpatient settings play a huge role in ensuring the co-morbidities are appropriately evaluated and managed [5]. Specific roles taken up by pharmacist includes providing drug information, patient education and counselling, identifying drug-related problems, monitoring patient's outcome and making an appropriate recommendation to invidualise patients medication regimen [6]. A cross-sectional suggest that knowledge of CKD among Malaysian population is still inadequate, especially those who are at risk of developing CKD [7]. Therefore, this study would be a benchmark to give a better view on the knowledge of the disease and medication

as well as the impact of pharmacist role. The objective of this study was to evaluate the impact of pharmacists in improving medication knowledge among CKD patients.

MATERIALS AND METHODS

Study design and study site

This was a retrospective study using convenient sampling method, conducted among CKD patients in a tertiary care hospital in Malaysia to evaluate the impact of pharmacist role in improving medication knowledge among CKD patients.

Ethical approval

Inform consent form was obtained from the participant who enrolled to the clinic. This study had been registered with the National Medical Research Register (NMRR) and been approved by the Medical Research and Ethical Committee (MREC) for ethical consent and Clinical Research Center (CRC) of Hospital. An NMRR ID no 18-1121-41154 was given to conduct the study.

Eligibility criteria

All CKD patients aged 18 y above who were enrolled in the program previously with complete pre and post knowledge assessment were eligible for the study. While patient with incomplete medical records, knowledge score and patients with mental health problems were excluded from the study.

Data collection

All the demographic data and knowledge assessment score throughout the sessions were collected from the patient's electronic medical record system. A self-design data collection form was used to retrieve patient's information such as demographic data and medical background. While for medication knowledge assessment, the pharmacist will ask about the dose/strength, frequency of administration, the purpose of use (indication) and method of

administration. 1 point given for each correct and zero marks for the wrong answer. The percentage score calculated based on the total number of correct answers divided with the number of questions asked multiply by 100. Clinical pharmacists will educate the patient on recognition of medication, common side effects of medication, disease management and self-management of the disease.

Data analysis

All data were analysed using Statistical Package for Social Sciences (SPSS) for Windows version 24.0. Descriptive statistics, such as median±interquartile range, were used to summarize data. With statistical significance set at $p<0.05$, Wilcoxon signed-rank test was used to determine the significant difference of pre and post score of the knowledge shown by the CKD patients.

RESULTS

The study sample comprised of 13 CKD patients aged between 19 to 80 y, with the median age of 60.00 y. Elderly patients (≥ 60 y) were more than half of the study population (53.8%). Gender distribution showed almost even distribution of male and female patients. The racial distribution showed that 69.2% of CKD patients were Malays followed by non-Malays such as Chinese (n=2), Indian (n=1) and others (n=1). There were larger group of CKD patients (84.6%) taking more than 5 medications compared to those having less than 5 medications. While the studied population was categorized into their respective CKD staging according to KDIGO classification. The staging was almost evenly distributed, with the majority of CKD patient's stage 4 and 5 at 53.9%.

Table 1: Socio-demographic information

Variables	Frequency (%)	Median (IQR)
Age (Years)		60 (30)
Age Group		
Non-elderly (18-59)	6 (46.2)	
Elderly (≥ 60)	7 (53.8)	
Gender		
Male	7 (53.8)	
Female	6 (46.2)	
Ethnicity		
Malay	9 (69.2)	
Non-Malay	4 (30.8)	
No of medications		
<5	2 (15.4)	
≥ 5	11 (84.6)	
CKD stage		
1	1 (7.7)	
2	4 (30.8)	
3	1 (7.7)	
4	4 (30.8)	
5	3 (23.1)	

Table 2: Pre and post knowledge of the patients

N=13				
Variable	Pre-score median (IQR)	Post-score median (IQR)	Z-statistic	P-value[a]
Knowledge Score	13 (9.5)	18 (2.5)	-3.070	0.002*

[a]Wilcoxon Signed Rank Test, *$p<0.05$ is statistically significant

Table 2 shows the median knowledge score at the baseline was 13 while after completion of pharmacist-led educational intervention, the knowledge score improve to 18. A Wilcoxon signed-rank test was conducted to evaluate the impact of attending the CKD MTAC on the knowledge of the CKD patients. There was a statistically significant increase in the knowledge score between before MTAC and after MTAC session (p<0.05).

DISCUSSION

The elderly with age greater than 60 y contributes to the majority of the patient population followed by those ages from 18 to 59 y. A systemic review stated that on the prevalence of CKD in population-based study concludes that the prevalence of CKD varied strongly with age and increased with age [8]. This study also showed that there was high male CKD patient compared to female. This is contrary to the findings by Hill *et al.* (2016), which deduced that CKD was more prevalent in women than in men with a prevalence of 14.6% compared to 12.8%, respectively. However, male patients were found to have a significantly higher progression from late stage of CKD to ESRD compared to female patients [9]. This study reveals that the majority of the CKD patients were at the late stage of CKD, which were stage 4 and 5. Similar trend was observed in a study conducted at Penang General Hospital, which saw a higher prevalence of stage 5 CKD patients [10].

Most importantly, there was a statistically significant increase in knowledge score (p<0.05). This was comparable to a study conducted by Ghimirey *et al.*, (2013), in which pharmacist counseling was evaluated in the improvement of knowledge, attitude and practice in CKD patients [11]. The impact of pharmaceutical care in improving knowledge and medication adherence in CKD patients were observed which revealed that during initial knowledge assessment shows poor result and significant improvement in patient knowledge after being provided with patient education through patient information leaflets [12]. Impact of pharmacists had also been recorded in a systemic review by which shows they had reviewed pharmacists' interventions in the management of patients with CKD and concluded that positive association between pharmacist intervention and clinical outcomes improvement [13].

LIMITATIONS

To the best of our knowledge, this is the first study to comprehensively address the importance of the pharmacist-led educational intervention among CKD patients. However, there are some limitations in our study, such as there is no control group used; therefore, there were no direct comparisons between two groups of patients, one group involved with pharmacist intervention and the other group follows the conventional method.

CONCLUSION

Chronic kidney disease is a serious growing health concern worldwide. This study conclude that pharmacist can produce a significant improvement in patients' knowledge. Moreover, this study strongly shows that further understanding of the disease and medications regarding CKD is an integral part of the management of CKD with the involvement of pharmacists to achieve a positive outcome.

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Nil

AUTHORS CONTRIBUTIONS

All authors contributed equally to the preparation and final approval of the manuscript.

CONFLICT OF INTERESTS

Declared none

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