ORIGINAL ARTICLE

Household cost of chronic kidney disease care among patients presenting at Komfo Anokye Teaching Hospital, Ghana

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ABSTRACT

Background: Chronic kidney disease (CKD) has a major effect on global health, both as a direct cause of morbidity and mortality and as a risk factor for cardiovascular disease. This study was carried out to determine the household cost of CKD care among patients receiving treatment at a tertiary healthcare facility in Ghana.

Methods: This was a cross-sectional study conducted over a period of three months, from February to May 2019. The estimated household cost of CKD care comprised both direct and indirect costs of treating the condition. The direct cost was divided into direct medical and non-medical costs. The direct medical cost included the cost of medication, outpatient consultations, the cost of dialysis, ultrasound, and diagnostic work (including laboratory investigations). The direct non-medical cost included the cost of feeding and transportation. The indirect cost was based on the total time lost to productivity.

Results: A total of 224 patients were investigated in the study. The mean (± standard deviation) age of the patients was 49.62 ±15.37 years. The overall average monthly cost of CKD care for the 224 patients was GH₵3,467 (US$ 660.5), making up of 92.4% of the direct cost and 7.6% of indirect cost. The cost incurred by CKD patients on dialysis was significantly and almost five times higher than that of the non-dialysis CKD patients.

Conclusions: Our study has revealed that the progression of CKD is associated with increasing healthcare cost. Early detection and treatment are key to preventing and delaying the progress of the disease.

Keywords: chronic kidney disease, household cost, direct cost, indirect cost.

BACKGROUND

Chronic kidney disease (CKD) has a major effect on global health, both as a direct cause of morbidity and mortality and as a risk factor for cardiovascular disease [1]. In the 2015 Global Burden of Disease (GBD) study, CKD was ranked as the twelfth leading cause of death, accounting for 1.1 million deaths worldwide [2]. The 2017 GBD study estimated that the global prevalence of and mortality from CKD increased by 29.3% and 41.5%, respectively, between 1990 and 2017 [1]. In sub-Saharan Africa, CKD has become a significant public health challenge with an estimated prevalence of 13.9% [3]. The prevalence of CKD in Ghana is estimated at 13.3% [4]. This global increase in the incidence and prevalence of CKD is mainly driven by the rise in the prevalence of type 2 diabetes mellitus, hypertension, obesity and ageing [5,6].

CKD describes a medical condition in which there is the gradual loss of kidney function. It is generally defined as persistent abnormality of the kidney for more than three

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months with the kidney function measured by levels of the glomerular filtration rate [7]. People who are diagnosed with CKD may progress to end-stage kidney disease (ESKD), a condition which leads to disability, poor quality of life and substantial social and financial costs, and ultimately premature mortality [8].

The incidence of CKD is disproportionately higher among people who are socially disadvantaged, particularly those of low socio-economic status [8]. CKD has a significant negative impact both at the patient level, by reducing the quality of life and life expectancy, and at the population level, by increasing healthcare costs and the demand for healthcare services [9]. People with end-stage renal disease may require dialysis and/or a renal transplant. Globally, 2.6 million people received dialysis in 2010, a number which is projected to rise to 5.4 million by 2030. A systematic analysis for the Global Burden of Disease study conducted in 2013 revealed that years lived with disability due to CKD increased worldwide by 49.5% between 1990 and 2010 [10].

The debilitating nature of CKD may affect the working ability of patients, leading to absenteeism and loss of employment. Available evidence indicates that the greatest economic burden of CKD and other chronic diseases falls on low- and middle-income countries [11,12]. According to Essue et al. [13], kidney diseases are associated with an estimated 188 million cases of catastrophic healthcare expenditure in low- and middle-income countries. The economic consequences of CKD can be in the form of direct loss of gross domestic product as a result of ill health, losses due to household financing of care, changes in consumption patterns and welfare costs, as well as the financial burden incurred in managing patients with CKD and ESKD [13].

Knowledge of the healthcare costs (direct and indirect) borne by CKD patients is vital in the effective management of the disease [14,15]. However, while CKD remains an important cause of morbidity and mortality in Ghanaian hospitals, research on the economic burden of CKD at the household level is limited. In most developed countries, costs of CKD management are generally supported through health insurance schemes [16]. In Ghana, although patients who suffer from acute kidney injury and have to undergo acute haemodialysis are catered for under the National Health Insurance Scheme (NHIS), patients with ESKD on chronic dialysis services have to pay from their own pockets or need to have other sources of funding to be able to access these services [17]. In addition, patients living with CKD and ESKD are required to purchase certain classes of antidiabetics and antihypertensive drugs, blood tonics, intravenous iron preparations and subcutaneous erythropoietin stimulation agents and also have to undergo periodic laboratory and diagnostic investigations to determine how their bodies respond to treatment [17].

Considering the country's healthcare setting being characterised by limited resources [18], it is important to estimate the household cost of CKD care to support policymakers in deciding health policy strategies and resource allocation. For instance, such cost analyses will highlight the magnitude of the burden CKD has on patients and their households, thereby informing the need for insurance coverage.

In this study, therefore, we sought to determine the household cost of CKD care among patients presenting at Komfo Anokye Teaching Hospital, a tertiary healthcare facility in Ghana. The findings add to the few studies that have estimated the burden of CKD more broadly to patients and households in terms of economic hardship and financial distress.

MATERIALS AND METHODS

Study design and setting

A cross-sectional study was conducted over a 3-month period from February to May 2019 among CKD patients who were receiving treatment at Komfo Anokye Teaching Hospital (KATH), a 1,200-bed tertiary healthcare facility located in Kumasi, the capital of the Ashanti Region of Ghana. KATH is the second-largest hospital in Ghana and the only government hospital in the Ashanti Region that has a dedicated renal clinic for patients suffering from CKD. Located within the Internal Medicine Directorate of the hospital, the renal clinic has an average weekly attendance of 40 patients. Over the past five years, kidney disease has consistently been among the top ten causes of admission at the hospital's Internal Medicine Directorate. The renal clinic also provides services in the form of internal consultations for other directorates, such as Anesthesia and Intensive Care, Obstetrics and Gynaecology, and Surgery [19].

Participants and sampling procedure

We employed a convenience sampling technique to select 224 patients with any stage (stages I–V) of CKD, who were 14 years and above and receiving treatment at the study site during the survey period. The Kidney Disease Improving Global Outcomes' definition of CKD as "abnormalities in kidney structure or function (albuminuria, urine sediment abnormalities, electrolyte and other abnormalities due to tubular disorders, abnormalities detected by histology, structural abnormalities detected by imaging, history of kidney transplantation, and a glomerular filtration rate <60 mL/min/1.73 m2) present for more than three months, with implications for health" [20] was used. Patients with CKD who were critically ill, as well as those younger than 14 years, were excluded from the study.

Household cost of CKD

The estimated household cost of CKD care was made up of direct and indirect costs of treating the condition. This estimate was based on payments made by patients in the course of seeking CKD treatment. All payments covered under the NHIS were not part of this estimation exercise. The direct cost was divided into direct medical and direct non-medical costs. The direct medical cost included cost of medication, outpatient consultations, cost of dialysis, diagnostic work (including laboratory investigations), and ultrasound and computed tomography requests. The direct non-medical costs included the cost of feeding and transportation. The indirect cost was based on the total time lost to productivity. This assessment was made up of the time patients had to travel from their place of employment to the renal unit to seek health care, as well as the time they spent in accessing treatment while at the hospital. Table 1 gives a detailed description of the measures used in the study.

Data collection technique and tools

Face-to-face interviews were conducted using a structured questionnaire to collect the data. The questionnaire had both open- and closed-ended questions covering relevant information on patients' demographic data, employment status, and occupation. A copy of the questionnaire is appended as supplementary information (Appendix 1). Secondary information on the costs of medications, laboratory diagnostics, registration and consultations was obtained from a review of the patients' hospital records. Two interviewers were recruited and trained for the data collection, who were national service personnel within the Medicine Directorate. The interviewers, who spoke fluent Twi (the local dialect) and English, were further trained to accurately translate the English questionnaire into Twi in order to elicit the appropriate responses from the study population. The interviews were conducted in either Twi or English and lasted between 10–15 minutes.

Table 1. Description of study variables.

Type of cost	Category of cost	Description of cost
Direct cost	Medical cost	Medications Diagnostics Dialysis Consultation NHIS* renewal
	Non-medical cost	Transportation Food/diet
Indirect cost	Indirect cost	Lost wages Lost jobs Lost working hours

*NHIS, National Health Insurance Scheme..

The questionnaire was pre-tested before its administration in full. Pre-testing, which lasted approximately a week, included patients with CKD and their household members who always accompanied them to the hospital for treatment. This offered the chance to identify most of the problems and address them accordingly. Data from the pre-testing were not included in the final analysis.

Data analysis

Microsoft Excel and STATA (version 13) were used in the analysis of the data. The various household costs incurred by the CKD patients were estimated. The direct cost per each stage of the disease was derived by summing the medical cost and non-medical cost components and then averaging the total to obtain the average cost for each stage. Similarly, the total of direct costs incurred by the patients were added and divided by the total number of respondents to obtain the average cost. The human capital approach was employed to measure the loss of productivity for patients with CKD who were receiving health care. The current minimum daily wage in Ghana is GH₵10.65 and the average working day is 8 hours, corresponding to the cost of one working hour to GH₵1.33. This hourly cost was then multiplied by the total travelling time in hours and the number of hours a patient spent at the hospital each visit, to arrive at the cost equivalent of each visit. Based on the average number of visits per month, the indirect cost of CKD care was estimated. Patients who were accompanied by relatives who were gainfully employed also had their corresponding indirect cost computed. The mean total cost of seeking CKD care was computed as the sum of the mean total direct and indirect costs. All costs were expressed in Ghanaian currency (GH₵) and then converted into US dollars (US$) using the exchange rate US$1.00 = GH₵ 5.25 at the time of the study (Daily Interbank Forex Rate, 2020).

Ethical consideration

Ethical approval was sought from the Ethics Committee on Human Research Publications and Ethics (CHRPE) of Kwame Nkrumah University of Science and Technology (KNUST) and Komfo Anokye Teaching Hospital, with reference CHRPE/AP/031/19 prior to the start of the study. The respondents suffered no harm during this work. All participants signed a written informed consent form and were given the assurance that their information was treated as strictly confidential. They were told also of their freedom to decline participation at any stage of the study. Guardians of participants below the age of 18 were also made to sign a consent form.

RESULTS

Characteristics of the study respondents

Table 2 presents the demographic and clinical characteristics of the study population. The mean age (SD) of the patients was 49.62 (15.37) years. The majority were male (52.7%), married (58.5%), Christian (86.6%), employed 76.3%), and with a basic level of education (72.3%). Regarding monthly income, 45.9% indicated that they were earning less than GH₵500 (US$95), with only 22.3% reporting that they were earning more than GH₵1,000 (US$190). The mean monthly income was GH₵897.9 (US$171.0). One hundred and eight were stage V CKD patients, of whom 48 were on dialysis and 60 not receiving dialysis. Almost half (49.6%) had been on treatment for less than one year.

Table 2. Socio-demographic and clinical characteristics of the respondents.

Variable	Heading ??	Percentage
Age (years)		
14–24	11	4.9
25–34	25	11.6
35–44	50	22.3
45–54	52	23.2
>54	86	38.4
Gender		
Male	118	52.7
Female	106	47.3
Marital status		
Single	39	17.4
Married	131	58.5
Separated	7	3.1
Divorced	21	9.4
Widowed	26	11.6
Educational level		
Basic	162	72.3
Secondary	55	24.6
Tertiary	7	3.1
Employment		
Unemployed	53	23.7
Employed	171	76.3
Monthly income (GH₵)		
<500	103	45.9
501–1000	71	31.7
>1000	50	22.3
Registered with NHIA*		
Yes	224	100
No	0	0
CKD stage		
Stage I	9	4.0
Stage II	13	5.80
Stage III	45	20.1
Stage IV	49	21.9
Stage V	108	48.2
Duration of treatment		
<1 year	111	49.6
1–3 years	101	45.1
>3 years	12	5.4

*NHIS, National Health Insurance Scheme.

Direct cost of seeking CKD care

Tables 3 and 4 summarise the direct cost for CKD patients not on dialysis and on dialysis, respectively. The mean monthly direct cost for CKD treatment with no dialysis was GH₵519.5 (US$ 99.0), 87.3% representing medical costs and 12.7% non-medical costs. The corresponding cost for CKD treatment with dialysis was GH₵2,684.4 (US$511.3), with the medical cost component being 90.3%. Dialysis alone accounted for 61.7% of the direct cost borne by the CKD patients on dialysis, with 48 patients incurring an average monthly expense of GH₵1,655 (US$315.2); an average single session cost GH₵190 (US$36.2). The monthly direct cost of CKD treatment with dialysis was 5.2 times higher on average than that without dialysis. The NHIS renewal fee formed the smallest component of the medical cost for both classes of patients. On average, patients spent a little under GH₵25 (US$4.8) per month, which accounted for 0.83% and 3.9% of the total direct cost for CKD treatment with and without dialysis, respectively.

Indirect cost of seeking CKD care

Tables 5 and 6 show the overall indirect cost of CKD care (all stages inclusive). The mean monthly indirect cost per patient with no dialysis was GH₵65.2 (US$12.4) and that for treatment with dialysis was GH₵198.4 (US$37.8). Overall, 36 of the patients on dialysis and 113 of those not on dialysis admitted to having lost wages at their workplace while seeking care, which accounted for 55.9% of the overall indirect cost with a mean of GH₵65.2 (US$12.4). Ninety-four of the 224 respondents had their caregivers or relatives accompanying them to seek treatment; those who were employed had a mean productivity loss of GH₵33.3 (US$6.3), constituting 18% of the overall indirect cost of CKD care.

Overall household cost of CKD care

The overall average monthly cost of CKD care for the 224 patients was GH₵3,467 (US$661). This was extrapolated to an average annual cost of GH₵41,610 (US$7,926). The direct cost formed 92.4% of the overall household cost, while the indirect cost constituted 7.6%. In all, patients with end-stage CKD on dialysis incurred the greatest cost compared to all the other patients, as indicated in Table 7.

Table 3. Monthly direct treatment cost of CKD – no dialysis (n =176).

Cost item	Total cost (GH₵)	Mean (SD) (GH₵)	Median (GH₵)	Minimum (GH₵)	Maximum (GH₵)	Cost profile (%)
Medical cost						
Cost of medication	50,361	281.44 (64.3)	255	20	1,000	55.1
Cost of diagnostics	25,849	146.9 (33.9)	130	34	3,000	28.3
Cost of NHIS renewal	3,608	20.5 (7.1)	25	2	50	3.9
Total medical cost	79,818	453.5 (88.3)	463.5	89	2,825	87.3
Non-medical cost						
Cost of transportation	18,148	50.0 (37.7)	33.5	4	300	19.8
Cost of feeding	2,835	16.1 (12.6)	10	3	400	3.1
Total non-medical cost	11,621	66.0 (41.2)	49	9	1,600	12.7
Total direct cost	91,439	519.5 (97.8)	256.25	116	2,825	100

Abbreviation: SD, standard deviation.

Table 4. Monthly direct treatment cost of CKD with dialysis (n = 48).

Cost item	Total cost (GH₵)	Mean (SD) (GH₵)	Median (GH₵)	Minimum (GH₵)	Maximum (GH₵)	Cost profile (%)
Medical cost						
Cost of medication	22,765	474.3 (227.8)	500	120	950	17.67
Cost of diagnostics	13,091	272.7 (419.3)	184	80	3,000	10.56
Cost of dialysis	79,440	1,655 (135.2)	1,520	1,520	7,200	61.65
Cost of NHIS renewal	1,067	22.23 (6.7)	25	5	28	0.83
Total medical cost	116,363	2424 (176)	640	84	3,800	90.31
Non-medical cost						
Cost of transportation	9,352	194.8 (155.4)	128	64	800	7.26
Cost of feeding	3,126	65.3 (69.4)	40	16	480	2.43
Total non-medical cost	12,488	2,60.2 (191.7)	80	196	960	9.69
Total direct cost	128,851	2,684 (194)	2,435	1,785	8,209	100

Abbreviation: SD, standard deviation.

The cost incurred by CKD patients on dialysis was significantly and almost five times higher than that of the non-dialysis CKD patients (83% against 16% for non-dialysis patients).

DISCUSSION

This is among the few studies to comprehensively measure the cost borne by CKD patients and their household in the management of the disease in Ghana. All cost estimates were from the patients' perspective. These results revealed that the overall direct cost of seeking CKD care was the major component of the household expense, at about 92%. We also observed that CKD care represented a huge financial burden on patients on dialysis. On average, they spent GH₵1,655 (US$315) per month – which is about 5.1 times the minimum monthly wage (US$60.85) in Ghana – to access dialysis services. This finding supports an earlier study in Burkina Faso, which reported that the average cost of dialysis services borne by patients and their households was about 2.1 times higher than the country's minimum professional wage [21]. For patients with non-dialysis CKD, medication formed the major cost component (55.1%) of the direct estimated cost, followed by the cost of diagnosis (28.3%). This is consistent with a study by Gummidi et al. [22], who observed that medical cost represented the greatest portion of the total direct cost of CKD care borne by non-dialysis CKD patients in Uddanam, India, followed by laboratory charges. All of these studies indicated that direct costs form the major cost component at all stages of CKD care.

We found also that the majority of our study population were in the late stages of the disease. Approximately 70%

Table 5. Monthly indirect treatment cost of CKD – no dialysis.

Cost item	Total cost (GH₵)	Mean (SD) (GH₵)	Median (GH₵)	Minimum (GH₵)	Maximum (GH₵)	Cost profile (%)
Loss of productivity						
Loss of wages	6,997	39.8 (23.9)	85.2	10.7	85.2	60.9
Loss of working hours for patient	2,725	15.5 (11.3)	13.3	5.3	138.3	23.7
Loss of working hours for employed caregiver	1,752	10.0 (6.4)	14.0	5.9	138.3	15.4
Total direct cost	11,474	65.2 (42.1)	63.9	5.6	361.8	100

Abbreviation: SD, standard deviation.

Table 6. Monthly indirect treatment cost of CKD with dialysis.

Cost item	Total cost (GH₵)	Mean (SD) (GH₵)	Median (GH₵)	Minimum (GH₵)	Maximum (GH₵)	Cost profile (%)
Loss of productivity						
Loss of wages	2,716	75.4 (22.3)	85.2	21.3	85.2	28.5
Loss of working hours for patient	3,814	79.5 (31.3)	74.5	42.6	244.7	40.1
Loss of working hours for employed caregiver	2,995	78.8 (33.0)	74.5	42.6	244.7	31.4
Total direct cost	9,525.4	198.4 (75.8)	191.5	79.8	574.6	100

Abbreviation: SD, standard deviation.

Table 7. Estimated household cost of CKD care.

Type of cost	Average cost per month GH₵ (US$)		Average annual cost GH₵ (US$)	
	Dialysis	Non-dialysis	Dialysis	Non-dialysis
Direct	2,684 (511)	520 (99.0)	32,213 (6,136)	6,234 (1,187)
Indirect	198 (38)	65 (12)	2,381 (453)	782 (149)
Total household cost	2,883 (549)	584.7 (111)	34,594 (6,589)	7,016 (1,337)

US$1.00 equivalent to GH₵5.25 (Bank of Ghana average monthly interbank exchange rate, July 2019).

were in stage IV or V. This is consistent with a recent study [23] in which the authors observed that, generally, over 75% of CKD patients in Ghana report for treatment in late stages of the disease. End-stage kidney disease requires haemodialysis, a service which is not only expensive but also limited in the country [23]. Haemodialysis services are currently available in only five out of the 16 regions in Ghana, resulting in patients having to travel long distances to access care for their end-stage condition [24]. Thus, people should be encouraged to seek early detection and prompt treatment to slow or avert the progression of their illness to end-stage CKD.

The cost of a session of haemodialysis varies around the world. Studies from other countries including Cameroun and India have reported the cost of a session of dialysis to be US$8.5 [25] and US$44 [26], respectively. In contrast to these previous studies, we found the average cost of a single session of dialysis to be US$36.20. These significant differences in cost can be attributed to the variations in the characteristics of these countries' healthcare systems, such as the public–private split in healthcare expenditure, the structure of financing and reimbursement for providers of end-stage renal disease care, and ultimately the subvention of dialysis services.

Although all of our study respondents reported that they had registered with the National Health Insurance Authority (NHIA), with about 97.8% indicating health insurance as a source of finance for their health care, the NHIS does

not cover chronic dialysis services. This implies that the majority of the end-stage dialysis patients paid a huge part of their treatment cost from their own pocket. It is therefore important for people with CKD, particularly end-stage renal disease, to be certified as being medically handicapped so they could be paid monthly disability allowances to help them meet the rising cost of their CKD care.

LIMITATIONS

The limitations of this study are worth noting. First, children under 14 years with CKD were excluded and this limits generalising the findings to CKD patients of all age groups in the study area. Second, the CKD patients included in the study were from only one public hospital located in the Ashanti Region of Ghana. Thus, the findings have limited generalisability to the entire country. Third, we could not include intangible cost components in the total cost estimate; accounting for such additional factors as well-being losses due to physical pain, psychological pain and stress experienced by CKD patients and their household, would have broadened our cost estimates. That notwithstanding, the inclusion of direct and indirect cost components makes our cost assessment broader than in previous studies [27], which considered only the direct cost items borne by patients receiving CKD treatment. Fourth, using the national minimum wage to calculate loss of productivity might have resulted in underestimating the indirect cost of CKD care – for example, a highly functional graduate may represent more loss of productivity than a worker on a minimal wage. Fifth, the three-months period used for data collection might not be adequate to establish the true cost of care borne by the patients who were at various stages of CKD treatment. For instance, we did not observe any significant difference in costs carried by patients as they progressed through the stages of CKD care. Sixth, as cost estimation was from the patients' perspective, we depended on respondents' recall for our data collection and this could have been subject to recall bias. Finally, a sensitivity analysis was not performed to estimate the time values of the costs of CKD care. Conducting a sensitivity analysis would have helped in determining the robustness of the study.

CONCLUSIONS

Knowledge of the healthcare costs (direct and indirect) borne by CKD patients is vital in the effective management of the disease. This study has revealed the total monthly household cost borne by CKD patients presenting at KATH in Ghana. Our findings have indicated that the progression of CKD is associated with increasing healthcare cost, especially for stage V dialysis patients. Early detection and treatment are key to preventing and delaying the advancement of the disease. Thus, there should be a vigorous campaign and health education at the community level to help encourage people to seek early detection and prompt treatment of the disease. Early detection and prevention programmes should be targeted at high-risk groups in particular, such as people with diabetes, high blood pressure or a family history of kidney disease. The government of Ghana should also consider providing more renal dialysis centres to bridge the gaps in geographical access to haemodialysis services in the country. This will help reduce the cost components of CKD care, such as the expense of transportation (a non-medical, direct cost) and loss of productivity (an indirect cost).

Further research is needed to determine factors associated with the late presentation of patients to the renal unit, resulting in their incurring higher physical, social and economic costs at a late stage of the disease. Future surveys should also consider building on our study by using the cost of illness approach (COI) model to measure direct, indirect and intangible costs associated with CKD care in Ghana.

Data availability

Data used to support the findings of this study are included in the article.

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Conflicts of Interests

None

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APPENDIX 1: THE QUESTIONNAIRE USED IN COLLECTING DATA FOR THIS STUDY

SECTION A: SOCIO-DEMOGRAPHIC INFORMATION	
Age in years	
Gender	☐ [1] Male ☐ [2] Female
Marital status	☐ [1] Married ☐ [2] Single ☐ [3] Divorced ☐ [4]Widowed ☐ [5] Separated
Religion	☐ [1] Christian ☐ [2] Muslim ☐ [3] Traditionalist ☐ [4] Other
Educational status	☐ [1] No formal education ☐ [2] Primary ☐ [3] Secondary ☐ [4] Tertiary ☐ [5] Other (specify) _____
Employment status	☐ [1] Unemployed ☐ [2] Public sector employee ☐ [3] Private sector employee ☐ [4] Self-employed
If employed, are you still working in spite of your condition?	☐ [1] Yes ☐ [2] No
Do you receive any remittance as a result of your disease?	☐ [1] Yes ☐ [2] No
Place of residence	
Number of people in the household	
Are you a breadwinner of your household?	☐ [1] Yes ☐ [2] No
Are you registered with NHIS?	☐ [1] Yes ☐ [2] No

SECTION B: DIRECT COST OF SEEKING CHRONIC KIDNEY DISEASE HEALTHCARE	
When were you diagnosed with chronic kidney disease?	years
At what stage were you diagnosed with chronic kidney disease?	☐ [1] Stage I ☐ [2] Stage II ☐ [3] Stage III ☐ [4] Stage IV ☐ [5] End stage
How long have you been on treament for chronic kidney disease?	
How much do you and your caregiver spend on transportation when you visit the hospital as a result of having CKD?	
What is the source of financing for the cost of care? (Tick as many)?	☐ [1] Self ☐ [2] Relatives ☐ [3] Private Insurance ☐ [4] NHIS ☐ [5] Pensions ☐ [5] Donations/Gift ☐ [7] Others, please specify _____
How often do you visit the hospital as result of chronic kidney disease in a month?	☐ [1] Once ☐ [2] Twice ☐ [3] Thrice ☐ [4] More than three times
If you are an active subscriber of NHIS, answer questions 19–22	
How much do you pay annually as NHIS renewal fee?	
Are all your medications covered by NHIS?	☐ [1] Yes ☐ [2] No
If no, how much do you spend monthly on your medications?	
How much do you spend monthly on laboratory services?	
If you are not an active subscriber of NHIS, answer questions 23–25	
How much do you spend monthly on consultation fees?	
How much do you spend monthly on medications?	
How much do you spend monthly on laboratory services?	
Are you on dialysis?	☐ [1] Yes ☐ [2] No
If yes, answer questions 27 and 28	
How many sessions do you have in a month?	☐ [1] One ☐ [2] Two ☐ [3] Three ☐ [4] More than three
How much cost do you incur per session?	
How many members of your household support the household financially?	

SECTION B: DIRECT COST OF SEEKING CHRONIC KIDNEY DISEASE HEALTHCARE cont.	
How much do you spend on health care every month?	
How much do you spend on housekeeping every month?	
How much is your monthly income?	

SECTION C: INDIRECT COST OF SEEKING CHRONIC KIDNEY DISEASE HEALTHCARE	
If you are employed, answer questions 33–35.	
Have you absented yourself from work over the past one month because of suffering from chronic kidney disease?	☐ [1] Yes ☐ [2] No
If yes, how many times have you absented yourself from work over the past one month?	☐ [1] Once ☐ [2] Twice ☐ [3] Thrice ☐ [4] More than three
Have you lost income from your workplace over the past month as a result of seeking CKD care?	☐ [1] Yes ☐ [2] No
If you are unemployed, what is the reason?	☐ [1] On retirement ☐ [2] Student ☐ [3] Laid off due to CKD ☐ [4] By choice ☐ [5] Other (specify) _____
How many hours did you spend travelling in and out in seeking chronic kidney disease care over the last month?	
How many hours did you spend in receiving care at the hospital on your last visit?	
Have you suffered any disability as a result of CKD?	☐ [1] Yes ☐ [2] No
Do you have someone accompanying you when you attend the hospital to receive care?	☐ [1] Yes ☐ [2] No
Is your accompanying relative employed?	☐ [1] Yes ☐ [2] No
If yes, answer questions 42 and 43	
Which sector does he/she work in?	☐ [1] Public sector ☐ [2] Private sector ☐ [3] Self-employed
How many hours does your relative spend in a day taking care of you?	