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PRESCRIPTION KNOWLEDGE AMONG PATIENTS WITH CARDIOVASCULAR DISEASES AT THE MOI TEACHING AND REFERRAL HOSPITAL, KENYA

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ABSTRACT: Cardiovascular diseases (CVDs) cause 30% of deaths globally and are reported to be on the increase in sub-Saharan Africa. Medications prescribed for a CVD require a lifetime commitment. As a result patient must adhere to prescribed medication. However, prescription adherence is influenced to a large part by prescription knowledge. Although disease outcome is influenced by prescription knowledge, estimates of prescription knowledge and of factors that influence it are largely unknown in developing countries such as Kenya. The goal of the present study was to investigate factors that influence the level of prescription knowledge among patients with CVD at the Moi Teaching and Referral Hospital (MTRH). Specifically, the study determined the level of prescription knowledge, the association between socio-demographic characteristics of patients and their prescription knowledge, and whether prescribing clinicians explain prescriptions given to patients with CVD. The study used a cross-sectional study design with a sample size of 204. Data were collected using questionnaires. There was a significant difference ($X^2 = 144.75$, $p = 0.000$) in the frequencies between patients with high level and those with a moderate level of prescription knowledge such that more respondents had a high level of prescription knowledge. However, socio-demographic factors were not associated with prescription knowledge. Nearly 98% of respondents indicated that clinicians explained prescriptions to them and there was a significant association between the language of communication by the respondents and the level of prescription knowledge (P=0.043). Overall, the results of the present study provide an important springboard for future efforts aimed at enhancing prescription adherence.

INTRODUCTION: Cardiovascular diseases cause 17.6 million deaths globally [1]. Although there is a trend toward a decrease in the burden of CVD in developed countries, due in part to a parallel decrease in the prevalence of risk factors and improved care of patients with known CVD, the burden of CVD in Sub-Saharan Africa has increased to alarming proportions [1-3].

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Management of CVD is through lifelong medication that requires patients to adhere to treatment regimens. However, patients are less likely to adhere to medication if they do not understand their prescription including having information on indications, contraindications and dosing [4-6].

Low medication knowledge is associated with high chances of non-adherence to medication regimens [4, 7-10], which can lead to more frequent hospitalizations, increased healthcare expenditures and a higher risk of adverse health outcomes [11, 12]. Despite the overwhelming evidence on the relationship between medication knowledge and adherence, there is an absence of evidence on

interventions that use such knowledge to reduce the increasing burden of non-communicable disease in developing countries. Where evidence on patient-level risk factors is available, some socio-demographic factors have been shown to predict medication knowledge: age [13], education [7, 13] race [7], living arrangement or social support [7, 13, 14]. However, it is important to point out the role of context on the extent to which socioeconomic and demographic factors predict medication knowledge. Consequently, efforts to reduce morbidity and mortality associated with chronic diseases such as CVDs will require context-specific evidence.

It is equally important to note that effective communication between patients and physicians is key for patients to understand both their disease state and prescribed medication [4, 15-17]. Although medication knowledge and thus medication adherence begins with prescribing clinicians [15, 18, 19], it is not known whether prescribing clinicians explain prescriptions to patients with cardiovascular disease in developing countries such as Kenya. Also, whether patients understand prescriptions even when prescribing clinicians offer explanations remain unknown. This gap in knowledge is particularly worrying in Sub-Saharan Africa that faces the twin challenges of a rising burden of non-communicable disease [1] and health care system constraints including the absence of prescription guidelines for the management of chronic diseases.

The present study investigated prescription knowledge and its socio-demographic predictors among cardiovascular patients at the Moi Teaching and Referral Hospital, Kenya. Specifically, the study aimed to determine the level of prescription awareness, the association between socio-demographic factors and the level of prescription knowledge, and assess whether clinicians' explain prescription plans to cardiovascular patients.

METHODOLOGY: The study was conducted at the Moi Teaching and Referral Hospital (MTRH), Kenya. It adopted a cross-sectional study design and used a structured questionnaire to collect quantitative data. The target population for the study was all patients presenting with cardiovascular diseases at MTRH cardiovascular clinic.

Cardiovascular clinics are conducted twice every week at the hospital. A total of 2056 patients with cardio-vascular disease attend the clinic in MTRH per year translating to 172 patients per month. The study sought to target patients visiting the facility within two months and this a target population of 344 from which a random sample of 204 respondents was drawn. Study participants were aged 18 years of age and above.

The level of prescription knowledge and specific knowledge variables were measured on a 15-point scale where scores below 5.0 points indicated a low level of awareness, between 5-9 points indicated were a moderate level of awareness while 10 points and above indicated a high level of awareness. The scoring of the points was determined by a coding decision on whether the answer given by the patient depicted prescription knowledge or ignorance. Socio-demographic factors that we investigated were gender, age, marital status, occupation, educational level, settlement and living arrangement (whether the patient lived alone or not). The effectiveness of clinicians' communication of prescription plan to cardiovascular patients was measured on a 9-point scale where scores below 0-3 points indicated a low level of communication effectiveness, between 4-6 points indicated a moderate level of communication effectiveness while 7-9 points indicated a high level of communication effectiveness.

Data Analysis: Descriptive statistics were used to summarize level of knowledge, whether prescribing clinicians explained prescriptions and whether patients were the explanations to be effective. Chi-square test of goodness-of-fit was used to compare frequencies of respondents with a moderate and high level of prescription knowledge. Chi-square test of independence was used to determine the association between socio-demographic factors and the level of medication knowledge. Statistical significance was set at $p \leq 0.05$. The data was analyzed in SPSS Version 21.0. Ethical approval for the study was obtained from the Moi Teaching and Referral Hospital Ethical Committee, IREC/2016/252 Approval Number 0001925.

RESULTS: The socio-demographic characteristics of the respondents are presented in **Table 1**.

TABLE 1: SOCIO-DEMOGRAPHIC CHARACTERISTIC OF THE RESPONDENTS

	Characteristic	Frequency	Percent
Gender	Male	74	36.5
	Female	130	63.5
Age	Below 25 years	23	11.5
	26-35 years	36	17.3
	36-45 years	15	7.3
	46-55 years	31	15.4
	Above 55 years	99	48.5
Marital status	Single	39	19.1
	Married	130	63.7
	Divorced	5	2.5
	Widowed	30	14.7
Occupation	Employed	21	10.3
	Not employed	183	89.7
Education	No formal education	35	17.2
	Primary	74	36.3
	Secondary	58	28.4
	Post- secondary	37	18.1
Settlement	Formal	24	11.9
	Informal	180	88.1
	Total	204	100
Living arrangement	Yes	4	1.9
	No	200	98.1
Language of communication	English	11	5.8
	Kiswahili	120	59.2
	Mother tongue	35	16.5
	All	38	18.5

Level of Prescription Knowledge: The 15-item instrument used to measure the level of prescription awareness and respondent responses is shown in **Table 2**. Overall, the findings show that 87.3% of the respondents had a high level of prescription knowledge, 12.7% had a moderate level of knowledge while 0% had a low level of knowledge.

A chi-square analysis of the frequencies (excluding the low level of prescription knowledge) showed that there was a significant difference between the two categories of prescription awareness (X^2 = 144.75, p = 0.000), with more respondents having a high level of prescription awareness that would be expected by chance.

Association between Socio-Demographic Factors and Level of Prescription Knowledge: The findings indicate that of all the socio-demographic factors considered, only the patient's language of communication was significantly associated with the level of prescription knowledge (X^2_3 =8.141, p=0.043) as illustrated in **Table 3**.

TABLE 2: KNOWLEDGE OF PRESCRIPTION

Prescription awareness	Yes (%)	No (%)
Do you know the name of the medication you are on? Taking	119 (58.5%)	85 (41.5%)
Do you know the doses of the medication?	199 (97.7%)	5 (2.3%)
Do you know the frequency of administration for your medication	200 (98.1%)	4 (2.3%)
When you experience side effects from the drugs, do you stop taking them?	9 (4.6%)	195 (95.4%)
You know what to look for to determine if the medication is working	34 (16.1%)	170 (83.1%)
Can you share drugs with other members of your family who present similar symptoms?	17 (8.5)	187 (91.5%)
Whenever you skip taking the medication, is it important to inform the doctor during your visits?	191 (93.8%)	13 (6.2%)
Is it important to stick to medical prescription as per the doctor's advice?	195 (95.8%)	9 (4.2%)
Is it important to seek information from the doctor concerning the condition?	204 (100%)	0 (0%)
I am aware of the risk factors of my medical condition	198 (96.9%)	6 (3.1%)
Would you say that the purchase of drug is your financial priority	130 (63.8%)	74 (36.2%)
Does taking drugs as prescribed makes you fall sick less often?	120 (58.8%)	84 (41.2%)
Is it not a must that you take all the drugs as prescribed	13 (6.4%)	191 (93.6%)
Do you seek medical attention when you experience side effects?	1 (0.4%)	203 (99.6%)
You can stop the medication when you feel better	4 (1.9%)	200 (98.1%)

TABLE 3: ASSOCIATION BETWEEN SOCIO-DEMOGRAPHIC FACTORS AND LEVEL OF PRESCRIPTION KNOWLEDGE

Socioeconomic and Demographic Variable	Chi-square Value	P value
Gender	0.634	0.562
Age	2.900	0.575
Marital status	0.315	0.957
Employment	0.923	0.358
Educational level	1.909	0.592
Settlement	0.001	0.577
Respondents living alone	0.741	0.504
Language of communication	8.141	0.043

Communication of Prescription Plan to Cardiovascular Patients: With regards to the question of whether prescribing clinicians explained prescriptions to the patients, the results indicate that according to 93.5% (191) of the respondents, health care providers provided information on prescriptions. Prescriptions were verbally communicated to 58.6%, written or verbally explained to 27.9%, and written to 13.5% of the respondents. Almost all respondents, 99.6%, said that the prescription explanation was understandable.

The 9-item instrument was used to assess the level of prescription communication by medical practitioners. The responses are shown in **Table 4** and suggest that prescribing clinicians' explanations were, for the most part, detailed and dealt with issues of dosing, drug interactions, safe storage of drugs, and availability of drugs in the market. Overall, according to 97.7% of the respondents, prescription explanations by prescribing clinicians were highly understandable while 2.3% of respondents indicated that the explanations were moderately understandable.

TABLE 4: PRESCRIPTION PLAN COMMUNICATION BY MEDICAL PRACTITIONERS

	YES		NO		
	Frequency	**Percent**	**Frequency**	**Percent**	**Total**
I was explained to how I suppose take my medication	204	100%	0	0%	204
I was advised on when I am supposed to take my medication	204	100%	0	0%	204
I was told for how long I would be taking drugs	197	96.5%	7	3.5%	204
I was told about possible drug interactions	122	60%	82	40%	204
I was advised about diet while taking drugs	160	78.5%	44	21.5%	204
I was told about the availability of the drugs in the market and their prices	172	84.2%	32	15.8%	204
I was told that I needed to refill the prescription when I run out of drugs	193	94.6%	11	5.4%	204
I was told about told about keeping appointments	202	98.8%	2	1.2%	204
I was advised on proper storage and disposal of my drugs	201	98.5%	3	1.5%	204

DISCUSSION: Three major results emerged from the present study. First, a majority of the respondents had a high level of prescription knowledge. Second, gender, age, marital status, occupation, educational level, settlement, and living arrangement (whether one lived alone or not) were not significantly associated with prescription knowledge. However, the language used by the respondents to communicate influenced their level of prescription knowledge. Third, according to a majority of the respondents, prescribing clinicians provided explanations on prescriptions and that the respondents found the explanations to be understandable.

The high level of prescription knowledge among cardiovascular patients attending the Moi Teaching and Referral Hospital implies that they had an understanding of dosing and counter-indications of the drugs they were prescribed. This is a rather surprising result given that the focus on non-communicable diseases in sub-Saharan Africa is only beginning to get traction. Medical education and the changing trends of information consumption in the country could have had a significant role in patient health care literacy. The high level of prescription knowledge reported for the present study contrasts with that reported by Chin and colleagues [14].

However, it is noteworthy to mention that the apparent inconsistency in results between the two studies may derive from differences in nature of questions participants were asked. Unlike Chin and colleagues [14], we did not match patients' responses to prescriptions in their possession and could therefore not accurately confirm their prescription knowledge.

Further research should be conducted targeting the patient's adherence to their specific medications prescribed. Nonetheless, whether the high level of prescription knowledge translates to medication adherence and thus improved health outcomes among cardiovascular patients who in most cases must use medication for the rest of their lives remains an open question.

The absence of an association between socio-demographic factors and level of prescription knowledge suggests that prescription knowledge is primarily an informational issue. This interpretation is supported by the significant association between the language of communication by the respondents and level of prescription awareness as well as the fact that nearly 94% of respondents confirmed that prescribing clinicians explained prescriptions. Furthermore, nearly all the respondents reported that prescription explanations were understandable.

However, these results contrast previous studies that demonstrated that age [13], education [7, 13], living arrangement [7, 13, 14] are associated with medication knowledge. In addition to contextual issues on the association between socio-demographic factors and medication knowledge, another potential source of inconsistent results across studies is the apparent differences in the elements of medication knowledge. There is, therefore, need to standard elements or constructs of medication knowledge, which will allow for comparisons across studies.

Findings of the present study support several studies that have shown that effective communication between patients and physicians is important for patients to understand their disease state and to fully understand and appreciate the need for medication and medication adherence [6, 15-17]. The high communication effectiveness can, therefore, be the reason why a majority of the patients had a high level of prescription awareness. These findings, however, differ from findings by [20] who evaluated audiotaped office visits and found major shortfalls in the quality of information communicated to patients about their prescribed medicines; physicians explained adverse effects and duration of therapy in only about a third of the discussions and provided patients with instructions for use in only 55% of the discussions. The study by [20] also indicated that communication with pharmacists is also inadequate and as a result, many patients rely on written information, either on labels or in package inserts.

CONCLUSION: Results of the present study support the accumulating body of evidence on the role of prescribing clinicians on medication knowledge. In light of the rising burden of chronic diseases continues to in sub-Saharan African these findings provide a starting point for targeted interventions aimed at enhancing medication adherence and thus in improving health outcomes among patients suffering from chronic diseases such as cardiovascular disease.

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