

ORIGINAL ARTICLE

Strategies used by Kenyan patients on maintenance haemodialysis for coping with stress related to intradialytic events

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ABSTRACT

Background: Patients on haemodialysis experience various challenges associated with their disease as well as complications related to therapy. Intradialytic events, such as cramping, hypotension and shivering, are major stressors for persons on haemodialysis. In an attempt to cope with stress associated with dialysis, most patients tend to adopt emotion-orientated coping strategies. This study aimed at evaluating the coping strategies used by patients at Kenyatta National Hospital, to deal with stress related to intradialytic events.

Methods: A cross-sectional study was conducted among 96 participants undergoing maintenance haemodialysis. They were selected through convenience sampling. Data were collected using a researcher-administered questionnaire for demographic data, a visual analogue scale to assess stress, and the Jalowiec coping scale. Data were analysed using SPSS version 23.

Results: The majority (62%) of the participants were male. Muscle cramps (55%), headaches (54%) and hypertension (47%) were the most commonly experienced intradialytic events. The mean level of stress on the Jalowiec scale was 5.1 ± 2.1 . The commonly used coping strategies were confrontational (45%), fatalistic (46%) and supportive (48%). The level of stress explained 66% of the variance associated with the use of a coping style ($P = 0.01$).

Conclusions: Intradialytic events were common among our participants and the majority used confrontational, fatalistic and supportive coping strategies. Tailored counselling services are recommended to reinforce effective coping.

Keywords: haemodialysis; intradialytic events; stress; coping strategies.

Chronic kidney disease (CKD) affects approximately 15% of people globally, with the greatest burden found in developing countries [1]. In sub-Saharan Africa, almost 16% of the population suffers from CKD, with 14% in the East Africa region, ranking it the 6th-fastest-growing cause of mortality worldwide [2]. The Kidney Diseases Improving Global Outcomes (KDIGO) guidelines define CKD as any abnormalities in kidney structure or function, which has been present for more than three months [3]. The final stage in the CKD continuum is the progression of the disease to end-stage kidney disease (ESKD), necessitating kidney replacement therapy (KRT) for patient survival [4]. While KRT encompasses haemodialysis (HD),

transplantation, peritoneal dialysis, and conservative management, HD is the most common approach used in developing countries [5]. Thus, nearly 90% of ESKD patients globally are on HD therapy [6].

It is estimated that approximately 75% of patients experience intradialytic complications, with 50% of them experiencing more than one complication at some time during the session [7]. When complications occur during a HD session, they are known as intradialytic events, the most common of which are hypotension (24%), muscle cramps (28%), nausea and vomiting (36%), headache (23%), itching (14%), chest pains (15%), fever with chills

(37%) and hypoglycaemia (10%) [8]. Other, rare intradialytic events include cardiac arrhythmias (8%), seizures (7%), haemorrhage (7%) and hoarseness of voice by the end of the HD session (5%) [9].

Intradialytic events are a source of physiological and psychological stress to the patients. The occurrence of intradialytic events results in increased likelihood of early sign-offs or of patients missing HD sessions [10]. These complications are also attributed to increased stress and a higher risk of having anxiety disorders and depression [6]. Tchape et al. reported that stressors affect self-care, adherence to therapy, and overall participation in the treatment [11]. This in turn influences outcomes of therapy and sub-sequently health-related quality of life. A study by Kamau et al. showed that patients on HD in Kenya had low health-related quality of life, attributed to both psychological and physiological factors [12]. Kipturgo also reported that 89% of the patients undergoing HD suffered from anxiety whereas 84% experienced depression [13].

Coping mechanisms can either be emotion-orientated or problem-orientated [14]; different individuals adapt differently to the stressors. Most patients on HD tend to use emotion-focused coping strategies. This leads to patients tending to have a negative attitude towards the disease, thereby influencing their adjustment to therapy [15]. This can influence non-adherence to the treatment regimen. The level of adherence at Kenyatta National Hospital (KNH) is 51.5% [13]. It is therefore imperative to identify how these patients cope in order to establish a better care plan. Identification of the coping strategies and the stress level towards HD is important in helping the patients with psychological stress to plan care and assist them in identifying coping mechanisms that are beneficial to their health [16]. We therefore investigated intradialytic events experienced by patients undergoing HD at KNH, the level of stress experienced by those on HD and which coping strategies were used by patients at the hospital's renal unit to cope with stress resulting from intradialytic events.

METHODS

A descriptive cross-sectional survey was conducted in the renal unit at the KNH, a referral hospital in Kenya. The study targeted all the patients on maintenance HD. Convenience sampling was used to recruit 96 participants. The inclusion criteria were patients aged more than 18 years, who had been on HD for more than 3 months and had experienced an intradialytic event within the previous 3 months. Due to the COVID pandemic, some patients had been referred to satellite dialysis units to

reduce the patient numbers at the KNH renal unit, reducing the number of available participants.

Data were collected using an interviewer-administered questionnaire. This instrument had sections on demographic data, a Jalowiec coping scale, and a visual analogue scale as a measure of stress. The demographic form included questions on gender, age, marital status, education level, occupational status, housing, comorbidities, duration of HD, HD prescription and the type of intradialytic events experienced.

Definitions

Intradialytic events: Complications that occur during haemodialysis treatment sessions. These must not be present before starting the session. Common complications include hypotension, hypertension, muscle cramps, nausea and vomiting, headache, fever/chills, chest pain and hypoglycaemia.

Intradialytic hypotension: Blood pressure of less than 90/60 mmHg or a decrease in systolic blood pressure of ≥ 20 mmHg from the pre-dialysis measurement.

Intradialytic hypertension: An increase in systolic BP of ≥ 10 mmHg from the pre-dialysis measurement or an increase in mean arterial pressure of ≥ 15 mmHg.

The Jalowiec coping scale has a list of cues individuals use to cope with stress. The participant rated each of the cues in Part 1 on frequency of use and, for Part 2, how helpful the cue was in relieving any tension caused by the intradialytic events identified. The Jalowiec coping scale was used because the items listed under each coping strategy are practical and relevant. It has been used with many different populations, and also with family members of patients. The stress visual analogue scale was used to determine the level of stress the patients experienced in relation to HD. This scale is represented by a line with calibrations that indicate varying intensities of stress. One end of the line represents the absence of stress whereas the other end symbolizes intense stress as experienced by the patient. The scale is widely accepted, highly usable and shows moderate-to-good test-retest reliability.

Data collected were entered in Microsoft Excel and analysed using the Statistical Package for Social Sciences (SPSS) version 23. Patients' demographic characteristics, level of stress and coping mechanisms were summarised using percentages, means, modes and standard deviations. Linear regression was used to assess the relationship between the patients' demographic characteristics and coping mechanisms. ANOVA was used to analyse the relationship between level of stress and type of coping mechanisms, and the significance level was set at 5%.

Ethical considerations

Approval to conduct the study was granted by the KNH University of Nairobi Ethics and Research Committee, reference P74/02/2020. All participants gave verbal and written informed consent.

RESULTS

The socio-demographic characteristics of the participants are presented in Table 1.

The majority of the respondents (59.6%) had been on maintenance HD for a period of 1 to 2 years. The most

Table 1. Socio-demographic characteristics of the participants (n = 96).

Characteristic	Frequency [n, (%)]
Age (years)	18–29
	11 (11.5)
	30–39
	30 (31.3)
	40–49
Sex	32 (33.3)
	50–59
	19 (19.8)
	60 and above
	4 (4.2)
Marital status	Male
	59 (62)
Religion	Female
	37 (39)
	Married
	56 (58.3)
	Single
Highest education level	27 (28.1)
	Widow/Widower
	7 (7.3)
	Separated
	6 (6.3)
Employment status	Christian
	87 (90.6)
	Muslim
	6 (6.3)
Monthly income (Kenyan shillings)	Hindu
	3 (3.1)
	None
	1 (1)
	Primary
Number of people living with the patient	26 (27.1)
	Secondary
	57 (59.4)
	Tertiary
Relationship to the patient	12 (12.5)
	Employed (formal)
	20 (21.1)
	Self-employed
Relationship to the patient	50 (52.6)
	Unemployed
	25 (26.3)
	Less than 10,000
	17 (17.9)
Relationship to the patient	10,000–20,000
	17 (17.9)
	20,000–50,000
	34 (35.8)
Relationship to the patient	Above 50,000
	27 (28.4)
	None (stays alone)
	3 (3.1)
Relationship to the patient	Less than 3 people
	27 (28.1)
	3–5 people
	56 (58.3)
Relationship to the patient	More than 5 people
	10 (10.4)
	Nuclear family relatives
	72 (77.4)
Relationship to the patient	Extended family relatives
	20 (21.5)
	Friends
	1 (1.1)

Table 2. Blood flow and ultrafiltration rates achieved.

Variable		Frequency	Percentage
Average blood flow (mL/min)	200–250	8	8.3
	260–300	73	76.0
	310–350	15	15.6
Average ultrafiltration volume/session (L)	0.1	5	5.2
	1.1	37	38.5
	2.1–3	49	51.0
	3.1–4	5	5.2

Table 3. Intradialytic complications experienced by participants.

Complications	Frequency	Percentage
Muscle cramps	55	20.7
Headache	54	20.3
Hypertension	47	17.7
Nausea	27	10.2
Fever and chills	21	7.9
Vomiting	20	7.5
Chest pain	17	6.4
Hypoglycaemia	14	5.3
Hypotension	10	3.8

common comorbidity noted was hypertension (61.6%) with 35.0% having diabetes mellitus and 2% with other comorbidities such as HIV and polycystic kidney disease. The type of comorbidities present did not have a significant effect on the level of stress experienced ($P \geq 0.05$).

It was noted that 75 (78%) of the respondents had central venous catheters for vascular access, whereas the rest employed arteriovenous (AV) fistulae. None of the respondents had an AV graft. The blood flow rates and average ultrafiltration (UF) volumes achieved are shown in Table 2.

The majority of participants reported intradialytic events (90%), the details of which are summarised in Table 3. Only 12 participants (13%) had their dialysis session discontinued because of a complication experienced. Fifty of them (51%) reported that they had never been guided on ways to cope with stress related to intradialytic events.

The average level of stress experienced by the participants was 5.1 (2.1) on a scale of 0 to 10. Multiple regression indicated that the level of stress explained 66.3% of the variance in the coping style used ($P = 0.01$, $R^2 = 0.66$).

Strategies used by the participants to cope with stress related to intradialytic events was assessed using the Jaloweic coping scale. The study population rated listed activities in terms of frequency of use and level of usefulness in dealing with a stressful intradialytic event (Table 4).

Multiple regression predicted coping style from a set of socio-demographic characteristics including income, marital status, religion, age, sex, education level and employment status ($P < 0.01$, $R^2 = 0.42$). Age, highest education level, employment status and monthly income added statistically significantly to the prediction.

DISCUSSION

In this study, most participants were aged between 40 and 49 years. This is similar to a study conducted from Nigeria, which reported a mean age of 48 years [16], and differs from one from Iran, where most patients were older than 50 years [17], and from the UK, where the mean age was 62.7 years [18]. Most of our patients received an average of 8 hours of HD per week, the majority having been on treatment for less than 2 years. Raja and Seyoum reported that, in Eritrea, most patients received twice-weekly sessions of 4 hours [19], whereas in Iran most are given three sessions weekly, as reported by Moattari et al. [17].

Diabetes mellitus (DM) is the main cause of CKD globally, followed by hypertension [20]. This is reported in countries in Asia and North America as well as in Eritrea, Ethiopia and Nigeria [20,21,19]. In Kenya, however, hypertension is the leading cause, followed by DM, which concurs with other reports from East African populations [22]. In Brazil [23] and Iran [17], hypertension is also the main cause of CKD.

Muscle cramps, headaches and hypertension were the intradialytic events that were mostly experienced by

Table 4. Coping strategies used to deal with stress related to intradialytic events.

Coping style	Usage of coping style (%)			
	Never	Seldom	Sometimes	Often
Confrontational	24	31	29	16
Evasive	25	32	27	16
Optimistic	28	33	25	14
Fatalistic	28	26	28	18
Emotive	30	33	26	11
Palliative	32	29	26	13
Supportive	26	26	28	20
Self-reliant	27	31	26	16

patients at KNH. In other studies, hypotension was reported to be the most common intradialytic events [18,19], with other events including hypertension, hypoglycaemia, nausea and vomiting.

Information about coping strategies is important for participants experiencing intradialytic events. More than half of the patients in our study had not been informed about possible complications that could occur during HD therapy, nor were they advised on how to cope with such complications. This could explain why some experienced nervousness and stress towards HD. Bukhary et al. found that most patients on HD reported a moderate level of stress, while a few suffered a severe level of stress [25]. Folkman suggested that stress can adversely affect outcomes, quality of life, adherence to treatment, and disease progression [26]. Moattari et al. developed a happiness training programme that was guided by both behavioural and cognitive principles to help patients cope with stressors [17]. This resulted in a significant reduction in the reported levels of stress, anxiety and depression among the patients that underwent the training. Such training increased patients' sense of responsibility, self-sufficiency and feelings of hope, which improved their emotional and psychological states. These have been identified in studies performed in Boston and Iran [27]. In our setting, there are no programmes to help these patients manage stress, which could lead to despair and low quality of life. Training may involve patients, family members and healthcare providers, to ensure inclusive patient participation in their therapy plans.

The use and helpfulness of the coping strategies recognised here were relatively uniformly distributed, although those who used confrontational, fatalistic and supportive techniques were slightly larger in number. Supportive and self-

reliant strategies were found to be valuable by some of the patients. Some of the factors that were found to influence the choice of coping strategy were age, education level, employment status and monthly income. The level of stress was found to influence the choice of confrontational and evasive coping strategies.

Folkman avers that coping ability is influenced by biological and social factors. She suggested that the older one gets, the less the likelihood of using negative strategies such as avoidance and wishful thinking and the greater the chances of a person adopting a problem-solving style [26]. Moattari et al. found that most patients on HD used emotion-orientated, supportive (relying on religion) techniques, which they found somewhat helpful. Those who used a problem-orientated strategy were few but found it relatively helpful [17]. A study by Comelis showed that most patients on HD used emotion-focused strategies and that there were higher coping scores among diabetic patients [28]. These studies are in contrast with our findings and could be due to different patient factors, including age and the availability of resources such as customized counselling services.

CONCLUSIONS

The participants in our study experienced a moderate level of stress related to intradialytic complications and the majority employed problem-orientated coping strategies (confrontational and supportive). The level of stress was associated with a tendency to use confrontational and evasive coping styles. There is a need to provide more information to our patients on the complications related to HD and how to prevent them. We also recommend the provision of stress management training programmes for patients undergoing HD.

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