National Kidney Foundation (NKF) established a definition and classification of CKD in 2002. According to that, CKD is defined as either kidney damage or a decreased glomerular filtration rate (GFR) of less than $60 \text{ mL/min}/1.73 \text{ m}^2$ for at least three months (KDOQI, 2002). The numbers affected with CKD in low- and middle-income countries (LMICs) were 177.4 million men and 210.1 million women. Thus, CKD is a critical global-health challenge, especially in LMICs (Mils et al., 2010) Stanifer et al. (2016) stated that environmental toxins and urbanisation exposes a growing number of people to numerous infectious diseases and non-communicable diseases (NCD). This is a significant but poorly understood and rapidly growing health burden in LMICs, leading to significant morbidity and mortality due to treated cardiovascular disease and kidney diseases.

Furthermore, they noted that nearly 500 million people are estimated to have CKD, with the majority (80%) living in LMICs. Worldwide, cause of death due to CKD is now ranked as 19th, which represents an increase of 82% since 1990. Alebiosu and Ayodele (2005) stated that the prevalence of CKD is higher in developing countries than in developed countries.

A Presidential Task Force (2017) has been established for the prevention of CKD in Sri Lanka. It confirms, according to the available health statistics, that there are approximately 20,000 admissions/ re-admissions of patients with renal failure to government hospitals with nearly 2,000 annual deaths approximately in Sri Lanka. Approximately 70,000 patients with CKD has been identified in known high-risk areas of which majority are from the North Central Province (The official website of the Presidential Task Force of Sri Lanka). Community screening for CKD was started in 2008, and so far, 38,000 patients with CKD have been identified. Anuradhapura and Polonnaruwa Districts had about 1,500 patients who have been identified with CKD annually during the past four years (Ministry of Health, 2015).

Jayasekara et al. (2015) conducted a cross-sectional study to identify the epidemiology of CKD of uncertain aetiology in Sri Lanka by analyzing health statistics. Three cohort studies were conducted (n = 15,630, 3996, and 2809) to analyze the demographic information, age-specific prevalence, aetiology, and stage of presentation. Their results showed that the male-female ratio was 2.4:1, the mean age of patients was 54.7 ± eight years,

92% of the patients were farmers, and 93% consumed water from shallow-dug wells. The familial occurrence was common (36%). The majority of patients were stage 4 (40%) at the first presentation, while 31.8% were stage 3, and 24.5% were at stage 5. Stage one and two presentations accounted for only 3.4%. Therefore, CKD is a devastating disease in Sri Lanka.

Management of CKD

The kidneys are responsible for filtering waste products from the blood in the human body. Dialysis is the procedure that substitutes for many of the normal functions of kidneys. Dialysis can allow individuals to live productive and useful lives, even though their kidneys can no longer work adequately. There are two main types of dialysis, namely haemodialysis (HD) and peritoneal dialysis (PD). Haemodialysis uses a particular kind of filter to remove excess waste products and water from the blood (Shiel, 2017).

Globally, 2.6 million patients with ESRD received HD in 2010. This number is projected to almost double to 5.4 million by 2030 (Vijaindren, 2017). Statistics from 2010 showed that approximately 414,000 patients were receiving dialysis in the United States. An additional number of patients of over 179,000 had a functioning kidney transplant for ESRD (National Kidney Foundation, 2002).

Quality Of Life among patients with CKD

According to WHO (2017) definition, Quality of Life (QOL) of a person is an individual perception about his/her culture and the value system in which he/she lives, and about standards and concerns. Furthermore, WHO also adds other factors such as a person's physical health, psychological state, level of independence social relationship, personal beliefs and relationships of their environment (WHOQOL measuring QOL, Division of mental health and prevention of substance abuse, WHO, 1997).

John and Thomas (2013) explored the psychosocial experience of patients with ESRD and its impact on QOL (n=118) using semi-structured face-to-face interviews with the WHOQOL questionnaire. They found that there was a considerable psychological burden for those with renal issues and a considerable impact on QOL for those living with ESRD.

Another descriptive correlational study was conducted in Iran by Ahmadzadeh (2016) about the evaluation of individual QOL

among 53 patients with HD using a structured interview method. The author identified that the majority of the subjects was unemployed or disabled, only five were engaged in jobs, and they were in the lower-income category. Tilaki, Heidari, a n d Tilaki. (2017), conducted a case-control study in Iran, with 154 patients on HD and 308 healthy participants using a standard short-form questionnaire. Their result indicated that poor QOL among patients with HD.

In Greece, a qualitative and quantitative study was conducted by Gerogianni, Gerogianni, and Panagiotou (2016), their sample also included 100 patients, all of whom were assessed by interviewer-administered questionnaire. Researchers concluded that specific variables, such as age, gender, frequency and duration of dialysis, education, marital, financial and professional status, social functioning and effects of the renal disease could affect QOL of patients either positively or negatively.

Theofilou (2011) studied QOL in patients undergoing HD or peritoneal dialysis treatment. They assessed 144 patients using several tools namely, WHOQOL- BREF, General Health Questionnaire (GHQ-28) of Goldberg, State-Trait Anxiety Inventory, centre for Epidemiologic Studies Depression Scale (CES-D), and Multidimensional Health Locus of Control (MHLC). The author identified that the patients in HD treatment, compared to patients with PD treatment, had a more compromised QOL in the domains of environment and social relationships.

Another cross-sectional study was conducted by Edalat-Nejad, and Qlich-Khani., (2013) about the quality of sleep and health-related quality of life (HRQOL) in patients with HD in Iran. Quality of sleep was measured using the Pittsburgh Sleep Quality Index (PSQI), and HRQOL was measured using the Medical Outcomes Study 36-item Short Form (SF-36) in 115 patients with haemodialysis. The study concluded that poor sleep is common in dialysis patients and is associated with lower HRQO. Seckinger et al. (2016) conducted a prospective, longitudinal, nationwide, non-randomized study in Germany among 2507 patients to assess QOL and treatment parameters, adverse and intercurrent events, hospitalisations, morbidity and mortality in the age groups ≥75 and <75 years. The study found that the social QOL in elderly patients was more stable than in the younger cohort. In 2015 Gerasimoula et al. studied the influence of socio-demographic and clinical characteristics on the QOL in 320 patients undergoing HD in a one-

day dialysis centre by using Missoula- VITAS QOL Index (MVQOLI). Authors found that participants with higher education had a better quality of life, possibly because education allows a more profound understanding of the disease and compliance with the therapeutic regimen. Another alternative explanation was that higher education might reflect higher income and consequently ability to afford treatment.

A cross-sectional study conducted by Tannor et al. (2017) in South Africa involved both qualitative and quantitative methods using 106 patients. The study used the KDQOL SF 3.1 questionnaire, and 36 of them participated in the focus group interview. The researchers found that patients on PD were more symptomatic and experienced more treatment-related limitations than those on HD. There was no difference in the overall QOL between patients with HD and PD.

A quantitative study by Michel(2016) with a group of 286 Brazilian patients with CKD on being treated with haemodialysis used a demographic questionnaire, KDQOL SF-36 and analysis of the electronic medical record. Results indicated that people with CKD have considerable trouble in keeping or going back to their jobs on account of various physical, psychological, and legal obstacles. Females had lower QOL scores than males in practically all areas, particularly in the domains related to physical symptoms and emotional wellness.

Donciu et al. (2013) conducted a cross-sectional study on the impact of end-stage renal disease on quality of life using the Short Form Health Survey Questionnaire (SF-36) in Romania (n=102). The study concluded that HD patients experienced a more significant burden from physical and psychological symptoms of the disease, perceiving a considerable impairment in their QOL, especially related to the physical component.

Bayoumi et al. (2013) in Saudi Arabia studied the predictors of quality of life in haemodialysis patients (n=100) using the SF-36 and KDQOL-SF forms covering six domains of QOL, namely, physical, emotional, social, illness impact, medical and financial satisfaction, and overall general health. The study concluded that QOL reduced in all the health domains of HD patients.

A cross-sectional study among 223 patients was conducted by Braga et al. (2011) to identify factors associated with health-related

quality of life in elderly patients on haemodialysis in South-Eastern Brazil (n=223). QOL was measured with the Kidney Disease Quality of Life Short Form (KDQOL-SF) and the Medical Outcomes Study 36-Item Short-Form Health Survey (MOS SF-36). The study concluded that health-related QOL was consistently associated with chronic diseases points to the importance of the morbidity profile in elderly patients who are undergoing haemodialysis.

Briefly stated, several studies have been conducted in other countries regarding QOL among patient with CKD who are undergoing HD. However, in Sri Lanka, this area is not adequately studied. Therefore, the present study plans to assess the QOL with the focus on levels of physical, psychological and social health and the level of the environmental health of patients with CKD undergoing HD in two teaching hospitals, Sri Lanka. The findings of this may be useful for nurses to improve QOL among patients with CKD undergoing HD. Also, findings from this study may be more beneficial to nurses as they could have a perception about patients physical and mental health status and also their abilities and limitation which could influence them to plan and deliver better nursing care.

Methodology

Study Design
This study is a quantitative descriptive, cross-sectional study and was conducted at a Teaching hospital (TH) in Anuradhapura and the National Hospital of Sri Lanka (NHSL) as they are the two major hospitals in Sri Lanka which provide care for a large number of patients with CKD who are undergoing HD. The target population was patients with CKD, undergoing HD, and admitted to Dialysis Units (DU) of NHSL and TH Anuradhapura. Two hundred fifty participants (150 from NHSL and 100 from TH Anuradhapura) were selected under the following inclusion and exclusion criteria.

Inclusion criteria
Individuals who were diagnosed with CKD; age above 18 years; who can understand, read and write Sinhala, Tamil or English; and patients who have undergone HD for more than 03 months.

The following participants were excluded from the study: individuals less than 18 years of age and who were unable to speak, write or understand Sinhala, Tamil or English; patients who have

undergone HD for less than three (03) months; patients who were suffering from severe mental disorders.

Data collection

This study used two types of questionnaires as follows: Part a) demographic data; Part b) WHO-QOL BREF. Permission was obtained from WHO to use the WHO-QOL BREF (1997) tool. An agreement was signed and emailed to the WHO group. Permission was obtained from the WHO team after emailing the details of the proposal. According to the user agreement, the researcher is not permitted to translate the Questionnaire to any language. So English, Sinhala and Tamil language versions were requested and got down through email from WHO (WHOQOL-BREF Field Trial Version, 1996). There are 04 main domains of WHOQOL -BREF. They are physical, psychological, social and environmental health.

Each patient's QOL was assessed using interviewer-administered questionnaire after obtaining the ethical approval from the ethics review committee of KAATSU International University (KIU). The questionnaire aimed at gathering relevant information on patients QOL of physical, psychological, social and environmental health. Participants were approached in DU while on HD.

Data Analysis

Descriptive statistics were used, and the result was presented as the sample mean, mode, median. SPSS version 23 statistical software and MS Excel 2013 were used to analyze the data. The WHOQOL-BREF produces four domain scores. Two items were examined separately. The mean score of items within each domain was used to calculate the domain score.

According to the WHOQOL-BREF questionnaire, another 24 questions represent the physical, psychological, social and environmental domains. Each item was related to the 5 points Likert scale. The responses were scaled in a positive direction. According to the WHOQOL-BREF user manual, the mean score of the item within each domain was used to calculate the row score. Row score was then transformed to a 4-20 scale and 0-100 scale using a transformation formula. A higher score reflects a better QOL.

Ethical considerations

Ethical approval was obtained from the ethics review committee of KIU (reference number – KIU/ERC/17/011) before the data

collection. Further approval was obtained from the Deputy Director of NHSL and Director of TH Anuradhapura. Also, permission was obtained from the Consultant Nephrologists and the Nurse in charge of DU in NHSL and TH Anuradhapura.

Participation in this study was voluntary. Participants were fully informed of their rights to decline or withdraw from participation in the study as desired. The questionnaires were administered to the participants after obtaining the informed written consent.

Confidentiality and anonymity were maintained by using codes to identify each participant. All information was in a locked file cabinet.

Findings and Discussions

Results

A pilot study was conducted with the questionnaire using ten patients. They were not included in the main study. Statistical analyses was performed using SPSS 23 software and MS Excel 2013. The total number of participants (250) were included in this study. Participants respond rate 100%

Demographic characteristics of the participants
The median age was 30-49 yrs. According to the findings, most of the participants belonged to age groups 30-49 (39.6%) and 50-64 (39.6%). Majority of them were male 184 (73.6%). Female to male proportion was 1: 2.78. Most of the participants (79.6%) belonged to the Sinhala ethnic community (199 out of 250), and 185 of them (74%) were Buddhist. Two hundred twenty-four participants (89.6%) had achieved secondary education. All most all of them were married (83.6%). Out of 250 participants, 105 were unemployed (42%), and few were farmers 10 (4%). Average monthly income of 58.8% participants (147) was less than Rs. 29,999/- .121 participants (48.4%) had undergone three months to one-year duration of HD. Among the sample, 134 participants (54%) were admitted three times per week for HD.

1. QOL of the participants
A simulation study was conducted using WHOQOL-BREF. It contains 26 questions. The first two questions evaluated the overall perception of QOL and satisfaction with their health. As

shown in Table 1, 135 (54%) participants rated their QOL as neither poor nor good. Findings indicated that none of the participants was very satisfied with their health. An only a small amount of participants were satisfied (15.6) with their health.

Table 1. Overall perception of QOL and satisfaction with their health (n=250)

Characteristics	Frequency	Percentage
Overall perception of QOL		
Very poor	20	8.0
Poor	66	26.4
Neither poor nor good	135	54
Good	23	9.2
Very good	06	2.4
Health satisfaction		
Very dissatisfied	30	12
Dissatisfied	89	35.6
Neither satisfy nor dissatisfied	92	36.8
Satisfied	39	15.6
Very satisfied	00	00

According to the WHOQOL-BREF, other 24 questions represent physical, psychological, social and environmental domains. Each item is measured with 5-points Likert scale. The response was scaled in a positive direction. According to the WHOQOL BREF User Manual, the mean score of the item within each domain was used to calculate the row score. Row score was transformed to a 4-

20 scale and   0-100 scale using a transformation formula. The higher score reflects a better QOL.

There are no cut-off points above or below which QOL could be evaluated as "poor" or "good" thus it was decided to consider QOL<60 as poor; QOL and QOL>60 as good QOL when compared to a Brazilian study. The Brazilian study stated that OQOL ≥ 60 cut-off point was moderately sensitive for recognizing individuals with good/satisfactory QOL in Brazilian older adults. On the other hand, the sensitivity of the test with the OQOL < 60 cut-off point was optimum, as was poor/unsatisfactory (Silva, Soares, Santos, and Silva (2014).

2. QOL of the participants under the physical domain
Findings indicated that the patient had more concern about their pain. That physical pain prevents them from engaging in what they needed to do. There are 33 (13.2%) participants with an extreme amount of pain and 93 out of 250 participants (37.2%) who suffered from very much pain. It was difficult for 190 (76%) participants to balance daily life without medical treatment, and 76 felt that they needed the extreme amount of medical treatment, and 114 felt the intense need for medical treatment.

Findings revealed that 101 participants (40.4%) were neither satisfied nor dissatisfied with their ability to perform daily living activities. Most of the participants, 102 (40.8%), were dissatisfied about their capacity for work. They cannot balance daily life. 21 (8.4%) participants felt very satisfied with their sleep satisfaction.

0-100 scale of the physical domain was used to calculate the overall physical QOL. QOL<60 was considered as poor QOL, and QOL>60 as good QOL, as shown in Figure 1. All most all of the participants numbering 205 (82%) experienced poor QOL, and 45 (18%) participants experienced good QOL under the physical domain.
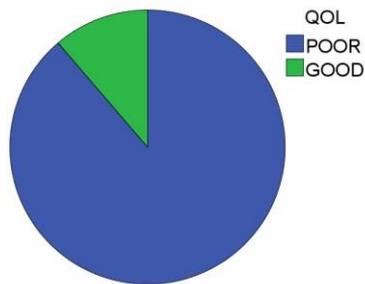
Figure 1. QOL of the participants under the physical domain (n=250)

3. QOL of the participants under the psychological domain

There are 06 questions included under the psychological domain (Q5, Q6, Q7, Q11, Q12, Q19, Q26). Data revealed that 2.3, or 116 (46.4%) of the participants were able to concentrate on things very much amount that in their daily living. Most of them, e 109 (43.6%) of the total sample, accepted their bodily appearance as a moderate amount. However, 76 participants (30.4%) enjoyed their life much, and 83 (33.2%) fell under a moderate amount.

0-100 scale of the psychological domain was used to calculate the overall psychological QOL. QOL<60 was considered as poor QOL, and QOL>60 as good QOL. Figure 2 indicated that the majority of participants, numbering 160 (64.8%) represented the poor QOL category, and 90 (35.2%) of them represented the good QOL category under a psychological domain.
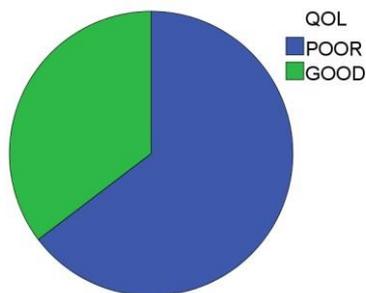

Figure 2. QOL of participants under the psychological domain (n=250)

4. QOL of participants under the social domain

There were 03 questions included in the social domain (Q20, Q21, Q22). Findings indicated that 95 individuals out of 250 (38%) were satisfied with their relationships. Some indicated that they were undecided the support they received from their friends. Only a small number of participants was very satisfied (4.4%) with their sex life.

0-100 scale of the social domain was used to calculate the overall social QOL. QOL<60 was considered as poor QOL, and QOL>60 as good QOL. As shown in Figure 3, 173 (69.2%) participants out of 250 were viewed as those experiencing poor QOL, and 77 (35.2%) of them were represented under the good QOL in the social domain.
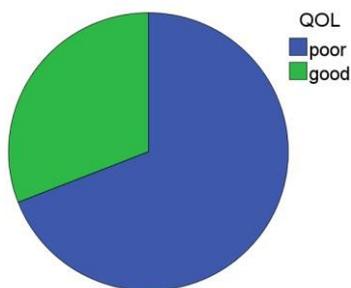

Figure 3. QOL of the participants under the social domain (n=250)

5. QOL of the participants under the environmental domain

08 questions represented the environmental domain (Q8, Q9, Q12, Q13, Q14, Q23, Q24 and Q25). Data indicated that 109 (43.6%) participants were satisfied with the conditions of their homes. More than 50% of the participants, 130 out of 250, cited their physical environment category as 'healthy'. However, 92 (36.8%) participants stated they had less money to meet their needs. There are 116 (46.4%) participants out of 250 who were satisfied, and 67 (26.8%) very satisfied with access to health services.

0-100 scale of the Environmental domain was used to calculate the overall Environmental QOL. QOL<60 was considered as poor QOL,

and QOL>60 as good QOL. As shown in Figure 4, 132 participants (52.8%) experienced poor QOL and 118 (47.2%) participant experienced good QOL under the environmental domain.
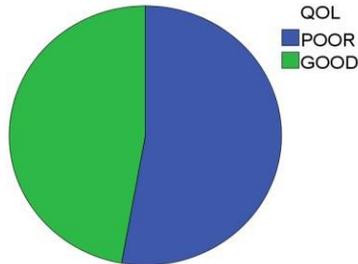

Figure 4. QOL of the participants under the environmental domain (n=250)

Above result indicated that participants experienced better QOL of the environmental domain than other domains.

6. *Overall QOL of the participants*

Overall QOL was calculated by the mean value of the above 04 domains. It included 24 questions. 0-100 scale of the overall QOL was used to calculate the overall QOL. QOL<60 was considered as poor QOL, and QOL>60 as good QOL. As shown in Figure 5, the majority of the participants 173 out of 250 (69.2%) represented poor QOL, and 77 (30.8%) of them good QOL. Therefore, the majority of patients with CKD having HD in two teaching hospitals, Sri Lanka experienced with poor QOL.
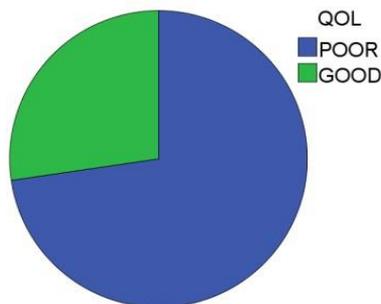

Figure 5. Overall QOL of the participants (n=250)

Comparison of overall QOL with demographic data

Two or more independent sample non-parametric test was performed to assess the difference between overall QOL and demographic data. As shown in Table 2, an education level (p=0.000), average monthly income (p=0.002) and the Frequency of dialysis (p=0.000) and QOL were statistically significant. Therefore there is a difference between education level, average monthly income and the frequency of dialysis and QOL. Gender, ethnicity, religion, marital status, occupation and HD duration vs QOL was not statistically significant (p>0.05).

Table 2. Comparison of overall QOL with demographic data (n=250**)**

Compare group	Significance level (p value)
QOL vs Gender	0.624
QOL vs Ethnicity	0.566
QOL vs Religion	0.939
QOL vs Education level	0.000*
QOL vs Marital status	0.747
QOL vs Occupation	0.346
QOL vs Average monthly income	0.002*
QOL vs HD Duration	0.246
QOL vs Frequency of Dialysis	0.000*

*significant level <0.05

Discussion

Majority of the participants of this study were Sinhala (79.6%), Buddhist (74%), Male (73.6%), married (83.6), under 18-64 age group (90.4%), secondary level educated (89.6%) and under 3month-1yr HD (48.4%). Most of the participants were unemployed (42.2%) and came under the lower-income category (58.8% under <29999Rs). A similar study was done by Ahmadzadeh (2016), and they stated that all the participants had been treated for one year, and (86.8%) were married. In terms of educational status, the majority of the participants were illiterate (71.7%), and none had an academic degree. The majority was unemployed or disabled, and only five had jobs. All the patients indicated that they were in the lower-income category. Almost one-half earned 160 US dollars per month(Ahmadzadeh, 2016). Another study conducted in Malaysia revealed that the majority of the respondents were unemployed (Baizura et al., 2013). Another study was conducted in Chile, and they found that most participants were male (57.9%), married (53.7%), with a partner (68.6%). On average, patients had 7.84 years of education; the majority declared being religious (91%), professionally inactive (77.1%) and with monthly economic revenues less than 5,000 Chilean Pesos (53.1%), equivalent to less than 200 Dollars per month (Guerrero et al., 2012). Another study carried out in Greece stated that majority of the participants (69%) were between 50-59 years old, and 44% have been receiving HD for 01-03 year (Gerogianni et al., 2016). Contrasting findings were identified in terms of education (Ahmadzadeh, 2016; Guerrero et al., 2012) employment (Ahmadzadeh, 2016; Baizura et al., 2013; Guerrero et al., 2012).

In this study majority of the participants were reportedly experiencing poor physical (82%), psychological (64.8%), social (69.2%) and environmental QOL (52.8%). QOL under physical domain was lower than the other domain and QOL under environmental domain was higher than the other domains. Similarly, a study done in Nepal revealed that patients with CKD undergoing dialysis had overall low QOL scores in all four domains (Joshi et al., 2017).

The first two questions in this study evaluated that individuals' overall perception of QOL and satisfaction with their health. Around 54% of participants rated their QOL to be in neither poor nor good category, and 34.4% (cumulative) participants were under

the very poor and poor category. Around 15.6% of participants were satisfied with their health. In contrast, the Brazilian study stated that around 56.3% of the older adults perceived their quality of life to be good or very good, and 7.9% as poor or very poor; 52.4% were satisfied or very satisfied with their health, whereas 23.0% considered it to be dissatisfactory or very dissatisfactory (Silva et al., 2014).

In this study, 69.2% of participants were observed to be experiencing poor QOL, and 30.8% participant good QOL. Therefore the majority of the participants were experiencing poor QOL. Similarly, an Indian study found that the overall QOL of patients on HD was significantly impaired (Abraham et al., 2012).

In this study, the education level (p=0.000), average monthly income (p=0.002) and the frequency of dialysis (p=0.000) and QOL were statistically significant. Therefore, there is a connection between the education level and average monthly income in QOL. However, gender, ethnicity, religion, marital status, occupation and HD duration are not statistically significant towards QOL. Similar studied conducted previously stated that the relationships between the QOL scores and education, job and marital status were not statistically significant (Ahmadzadeh, 2016). Another study found that participants of higher education had a better quality of life, possibly because education allows an in-depth understanding of the disease and compliance with the therapeutic regimen. Another alternative explanation is that higher education may reflect higher income and consequently, the ability to afford treatment (Gerasimoula et al., 2015). A similar study conducted in Iran revealed that older age, female gender, and lower educational level were significantly associated with a lower score of all physical, psychological, and social domains of QOL (Tilaki et al., 2017).

Findings of this study provide healthcare providers with ways to identify the patients' quality of life as well as to plan and implement strategies to help enhance it. It can also educate the patients by increasing their awareness of conditions that may affect their quality of life.

Conclusions

The findings revealed that majority of participants were from the Sinhala ethnic community, Buddhist, male, married, under 18-

64 age group were exposed to secondary level education, were undergoing HD for three months to 1year duration and participated in HD three times a week. Majority of the participants experienced poor QOL under each domain. However, QOL of the environmental domain was better than other domains and QOL of the physical domain lower than the other domain when compared to each other. Therefore, the majority of the patients with CKD undergoing HD in two teaching hospitals in Sri Lanka experienced poor QOL.

The education level (p=0.000), average monthly income (p=0.002) and the frequency of dialysis towards QOL are statistically significant. Therefore there is a difference between the education level, average monthly income and the frequency of dialysis and QOL.

Understanding of QOL in haemodialysis patients is useful for nurses when developing individualized interventions based on their personal needs and delivering holistic care to this population.

Limitations

This study was conducted only in two teaching hospitals. Therefore, the results cannot be generalized to the whole country.

Recommendations

There should be an awareness programme to improve the QOL of patients with CKD undergoing HD in Sri Lanka. There should be an educational programme to improve the nurses' further knowledge about a person's perception of QOL. Further study with a larger sample is recommended.

Acknowledgements

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