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## Assessing the knowledge of caregivers of patients undergoing Peritoneal Dialysis in the Mahaweli C Region, Sri Lanka

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### ABSTRACT

*Continuous Ambulatory Peritoneal Dialysis (CAPD) was identified as the best alternative treatment for developing countries like Sri Lanka having an increasing number of CKD and CKDu patients. Caregivers of CAPD patients play an important role in this treatment regime. However, the assessment of knowledge of caregivers of CAPD patients was not conducted systematically. This study aims to evaluate the knowledge of caregivers and improves the knowledge. The study was conducted in three stages, i.e. pre-interventional, interventional and post-interventional. The results obtained by the pre-intervention were analyzed and gaps were identified under each key area. Strategies were identified to achieve better patient safety practices. Further, the training/ workshop plan was conducted to improve the knowledge of caregivers at Divisional Hospital Girandurukotte. To check the effectiveness of the intervention statistically, a paired t-test was used. Correct answer count was obtained for each caregiver before and after data sets separately and marks were assigned for knowledge of each caregiver. Then averages were calculated for both datasets. Finally, using the paired t-test, before and after average marks were compared. The percentage of caregivers who gave correct answers increased after the intervention. Paired T-test results illustrate that there is a significant difference between before and after intervention Since the p-value is less than the 5% significance level, it can be concluded that after the intervention average marks of caregivers increased. Therefore, this intervention positively impacts the caregiver's awareness. Therefore, continuous educational programs for all patients and caregivers who receiving CAPD treatment are recommended to improve knowledge about treatment.*

**Keywords:** CAPD, Mahaweli C Region, Caregivers

### 1. INTRODUCTION

Chronic Kidney Disease (CKD) is increasingly recognized as a major public health problem in Sri Lanka. Males between 40 and 69 years with conflicting evidence of familial clustering in North Central, Uva, North Western and Central Provinces in Sri Lanka suffer from CKD and Chronic Kidney Disease of unknown etiology (CKDu) (Jayatilake et al., 2013, Athuraliya et al., 2009). Over 20,000 deaths were caused due to CKD and CKDu in the last decade and resulted in significant socio-economic impact (Nanayakkara et al., 2016). Renal care service demands are growing rapidly with the increase of CKD and CKDu cases. At present, the Mahaweli C region is identified as a high-risk geographic area for a high prevalence of CKD (Screening Guidelines Chronic Kidney Disease Sri Lanka, 2017).

The chronic and irreversible failure of kidney function is known as End-Stage Renal Failure (ESRF). Currently, available treatment options for ESRF patients are Kidney Transplant, Haemo Dialysis (HD) and Peritoneal Dialysis (PD). Although the treatment can prolong the life expectancy of ESRF patients, it impacts the patient's physical, psychological and social well-being and may impose a considerable burden on patients and families (Abdel-Kader et al., 2009, Troidle et al., 2003)

Among those methods, PD has been identified as the more affordable treatment method for CKD compared to HD due to its lower capital expenditure (Pavan et al., 2017, Ranasinghe et al., 2011). PD treatment has several advantages over HD. Major

advantages of the PD include simplicity of treatment process, limited need for trained human resources and minimal requirement for infrastructure facilities and technical support. Therefore, PD can be expandable with the increasing demand for treatment. Moreover, PD is a patient-friendly home-based treatment option. The treatment is done at the patient’s own home while continuing the patient’s day-to-day activities without affecting occupations and earnings. PD minimizes the risk of hepatitis B and C infection transmission compared to HD (Pavan *et al.*, 2017). Further, residual kidney function is not affected due to PD treatment and kidney function remains more or less at the same level.

Global trends in rates of peritoneal dialysis show that approximately 11 % of the global dialysis population (197,000 patients) use PD as a chronic life-sustaining treatment in 2008 (Jain *et al.*, 2012). Unique advantages of the PD including simplicity and minimal requirement for capital and trained human resources may lead to a 2.5-fold increase in the prevalence of PD patients in developing countries over the period of 1997 – 2008 (Jain *et al.*, 2012). PD was the best alternative treatment for developing countries like Sri Lanka having an increasing number of CKD and CKDu patients. Several pilot programs have been undertaken by the health care sector in Sri Lanka to explore possibilities to introduce PD (Nanayakkara *et al.*, 2016, Rope *et al.*, 2018, Perera and Palasuuntheram, 2001).

Microbiological aspects of peritonitis imply that the CAPD associated contamination mainly was due to non-adherence to strict sterile conditions during PD procedure (Perera and Palasuuntheram, 2001). Further, poor hygienic conditions associated with poor socioeconomic status and inadequate training in CAPD procedure have been identified as reasons for the high incidence of CAPD associated peritonitis in Sri Lanka. Furthermore, low patient uptake, high rates of peritonitis and high staff turnover were identified as further challenges in the CAPD programme in Sri Lanka (Nanayakkara *et al.*, 2016, Rope *et al.*, 2018). CAPD patients require a daily commitment and high level of involvement by the patient and/or carer with better attention. In this care, caregivers of CAPD patients play an important role in the treatment regime. Assessing the knowledge of caregivers of children undergoing peritoneal dialysis in Riyadh, Saudi Arabia implied that one-third of the sample did not know about the complications of PD and recommend frequent sessions of PD management and care (Awaji, 2019). However, the assessment of knowledge of caregivers of CAPD patients was not conducted systematically. Hence, this study aims to evaluate the knowledge of caregivers and improve the knowledge.

**2. METHOD**

The project was conducted in three (03) stages, i.e. pre-interventional, interventional and post-interventional. Interviewer Administered Questionnaires (IAQ) (Annexure 01) use to assess the knowledge of the caregiver during the pre-interventional and post-interventional stages. The results obtained by the pre-intervention were analyzed and gaps were identified under each key area. Strategies were identified to achieve better patient safety practices. Further, the training/ workshop plan was conducted to improve the knowledge of caregivers at Divisional Hospital-Girandurukotte.

To check the effectiveness of the intervention statistically, a paired t-test was used. Correct answer count was obtained for each caregiver before and after data sets separately and marks were assigned for knowledge of each caregiver. Then averages were calculated for both datasets. Finally, using the paired t-test, before and after average marks were compared.

$H_0: Mean (before) \cong Mean(After)$  Vs  $H_1: Mean (before) < Mean(After)$

**3. RESULTS AND DISCUSSION**

Table 1 shows the number of the caregiver who gives correct answered in the assessment before and after the intervention. According to Table 1, less than 30 % of caregivers have given correct answers to ‘What is CAPD?’, ‘What are the complications of CAPD?’ and ‘What are the signs and symptoms of peritonitis?’ and only 17 % of caregivers give the correct answer to ‘How often should you change a transfer set?’ before the intervention. In contrast, more than 90 % of caregivers have given the correct answer to ‘What are the signs and symptoms of inadequate dialysis?’ and ‘How often should you visit your doctor?’ before the intervention.

**Table 1 Number of correctly answered caregivers in the assessment before and after the intervention**

Questions	Number of caregivers who gave correct answers (N=29)			
	Before		After	
	(N)	%	(N)	%
What is CAPD?	8	28	24	83
What are the complications of CAPD?	8	28	24	83
What is most important in CAPD?	22	76	26	90
What are the signs and symptoms of peritonitis?	7	24	16	55
What should be done to avoid peritonitis?	20	69	27	93
What should be done when you suspect peritonitis?	12	41	27	93
What is exit site care?	21	72	26	90
When should PET be done?	9	31	21	72
How often should PET be done?	6	21	10	34
How often should routine blood tests be done?	16	55	16	55
How often should you visit your doctor?	27	93	27	93
How often should you change a transfer set?	5	17	14	48

What are the signs and symptoms of inadequate dialysis?	26	90	27	93
How many times can you reuse a minicap?	22	76	24	83
Is it advisable to miss an exchange option occasionally?	23	79	28	97
When should you order your stocks?	12	41	29	100
Who should ideally perform the exchange?	6	21	20	69

According Table 1 to the 69 % of caregivers give the correct response to ‘What should be done to avoid peritonitis?’ and 41 % of caregivers give the correct response to ‘What should be done when you suspect peritonitis?’. Further results show that 31 % of caregivers have aware of ‘When should PET be done?’, 21 % of caregivers know “How often should PET be done?”. 55 % of caregivers give the correct response to “How often should routine blood tests be done?” Awaji, 2019 also reported that one-third of the caregivers did not know about the complications of PD and recommend frequent sessions of PD management and care from the study of caregivers of children undergoing peritoneal dialysis in Riyadh, Saudi Arabia.

According to Table 2, caregivers who gave correct answers increased after the intervention for the majority of questions in the IAQ. Paired t-test results illustrate that there is a significant difference between before and after intervention (Table 2). Since the p-value is less than the 5% significance level, it can be concluded that after the intervention average marks of caregivers increased. Therefore, this intervention positively impacted the caregiver’s knowledge

**Table 2: Paired t-test statistics on average marks of caregivers in the assessment in Table 1**

	Mean	Standard deviation	Confidence interval	T-test statistics	p-value
Before	9.03	2.08	(-4.205, -1.658)	-4.710	0.000

#### 4. CONCLUSION

Based on the results of this study, it was found that the majority of caregivers were unaware of the basic concept of CAPD and complications of CAPD. The study shows that awareness of CAPD positively impacted the caregiver’s knowledge. Therefore, continuous educational programs for all patients and caregivers who receiving CAPD treatment are recommended to improve knowledge about treatment.

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#### ETHICAL CONSIDERATIONS

Ethical clearance to conduct the research project was obtained from the ethical review committee of the Postgraduate Institute of Medicine (PGIM), University of Colombo.

#### ANNEXURE 01

##### CAPD Questionnaire for Caregivers

1. What is CAPD?
  - a. Continuous automated peritoneal dialysis
  - b. Chronic ambulatory peritoneal dialysis
  - c. Continuous ambulatory peritoneal dialysis
  - d. None of the above

2. What are the complications of CAPD?
  - a. Mechanical complications
  - b. Loss of proteins
  - c. Peritonitis
  - d. All the above
3. What is most important in CAPD?
  - a. Following doctor prescription and instruction
  - b. Maintaining clean environment
  - c. Accepting responsibility for his health and treatment
  - d. Perfect maintenance of record book
  - e. All the above
4. What are the signs and symptoms of peritonitis?
  - a. Fever
  - b. Vomiting
  - c. Diarrhoea
  - d. Abdominal pain
  - e. Cloudy fluid
  - f. a, d ,e
  - g. All the above
5. What should be done to avoid peritonitis?
  - a. Maintaining clean environment
  - b. Avoid constipation
  - c. Check bag before use
  - d. Six step hand wash
  - e. All the above
6. What should be done when you suspect peritonitis?
  - a. Contact your doctor / PD nurse
  - b. Send first cloudy bag for tests before starting antibiotics
  - c. Come to hospital as soon as possible
  - d. Wait to see if the symptoms will subside by themselves
  - e. Consult local doctor
  - f. a , b , c
  - g. None
7. What is exit site care?
  - a. Daily dressings
  - b. No trauma to exit site
  - c. Keeping it dry at all time
  - d. No tension on the catheter
  - e. All the above
8. When should PET be done?
  - a. Immediately after catheterisation
  - b. 1 month after starting therapy
  - c. 1 month after peritonitis is cured
  - d. b , c
  - e. Anytime
9. How often should PET be done?
  - a. Once in 6 months
  - b. Once in a year
  - c. Depending on membrane characteristics and doctor advice
  - d. Once in 2 years
10. How often should routine blood tests be done?
  - a. Once in a month
  - b. Once in 3 months
  - c. Once in 6 months
  - d. Once a year
11. How often should you visit your doctor?
  - a. Once in a month
  - b. Once in 3 months
  - c. Once in 6 months
  - d. Once a year
12. How often should you change a transfer set?
  - a. Never
  - b. Once in 4 months
  - c. Once in 6 months
  - d. Once in 6 months or during peritonitis
  - e. Once in a year
13. What are the signs and symptoms of inadequate dialysis?
  - a. Feeling of weakness and tiredness
  - b. Loss of appetite
  - c. Nausea
  - d. Swelling in the feet
  - e. Itching
  - f. All the above
14. How many times can you reuse a minicap?
  - a. 3 times
  - b. Never
  - c. 4 times
  - d. Whenever the patient feels like it
15. Is it advisable to miss exchange options occasionally?
  - a. No
  - b. Yes, It can be missed occasionally
  - c. Yes, It can be missed when you are busy
  - d. Yes, It can be missed is when you are traveling
16. When should you order your stocks?

- a. When you have one months supply at home
  - b. When you have one weeks supply at home
  - c. When you have one days supply at home
  - d. On a daily basis
17. Who should ideally perform the exchange?
- a. The person who has been trained by a doctor/ PD nurse
  - b. Anyone available
  - c. Patient
  - d. All the above