

A Study to Assess the Effectiveness of Knowledge and Practice Regarding Peritoneal Dialysis Among Patients with End-Stage Renal Disease at Selected Nephrourology Departments

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Abstract

End-stage renal disease (ESRD) is a chronic and irreversible disorder in which kidney function declines permanently, making renal replacement therapy essential for survival. Among the available treatment options, peritoneal dialysis (PD) is considered a useful home-based therapy. Nevertheless, the effectiveness of PD largely depends on patients' understanding of the procedure and their ability to perform it accurately. This study was conducted to evaluate the impact of a structured teaching program on the knowledge and practice of PD among ESRD patients admitted to a selected nephrourology department. The research adopted a quantitative approach with a quasi-experimental one-group pretest and posttest design. Sixty ESRD patients receiving PD were chosen through purposive sampling. Data collection tools included a structured questionnaire for assessing knowledge and an observational checklist for evaluating practice. Following the pretest assessment, participants received a structured teaching program, and a posttest was carried out after seven days. The results demonstrated a marked improvement in both knowledge and practical skills after the educational intervention. The average knowledge score increased from 11.45 ± 3.21 before the intervention to 21.78 ± 2.64 after the intervention. In the same way, the mean practice score rose from 10.92 ± 2.87 to 20.35 ± 2.41 . Statistical analysis using the paired t-test indicated that these improvements were significant at $p < 0.05$. The study concluded that the structured teaching program effectively enhanced patients' knowledge and practice related to PD. Ongoing patient education and periodic reinforcement are therefore recommended to promote improved health outcomes and minimize the risk of complications.

Keywords: End-stage renal disease, PD, structured teaching program, knowledge and practice, renal replacement therapy

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INTRODUCTION

Chronic kidney disease (CKD) is now recognized as a significant worldwide health concern, with end-stage renal disease (ESRD) being the final and most advanced stage of the condition. Patients diagnosed with ESRD require renal replacement therapies such as hemodialysis, kidney transplantation, or peritoneal dialysis (PD) to sustain life. Among these, PD is widely accepted as a cost-effective and patient-friendly home-based method [1].

PD uses the peritoneum as a natural semipermeable membrane through which waste products and excess fluid are removed. Despite its

advantages, PD requires strict adherence to aseptic techniques, proper exchange procedures, and awareness of infection prevention strategies. However, studies have shown that many patients undergoing peritoneal dialysis lack adequate knowledge and practice skills, which can lead to complications such as peritonitis, catheter infections, and technique failure. Therefore, patient education plays a crucial role in improving outcomes and ensuring the long-term success of therapy [2].

In clinical settings, structured teaching programs (STPs) have been widely used to improve patient understanding and practical skills. These programs provide systematic instruction, demonstration, and reinforcement of key procedures. This study aimed to evaluate the impact of STPs on the knowledge and practice of PD among patients with ESRD attending a selected nephrourology department [3].

Objectives of the Study

- To evaluate the baseline knowledge of PD among patients with ESRD.
- To assess the initial level of practice related to PD among patients with ESRD.
- To examine the effectiveness of structured teaching in improving knowledge about PD.
- To determine the impact of structured teaching on the practice of PD procedures.
- To analyze the relationship between posttest knowledge scores and selected demographic characteristics.

Hypothesis

H1: A significant difference will be observed between the pretest and posttest knowledge scores related to PD among patients with ESRD.

H2: A significant difference will be found between the pretest and posttest practice scores regarding PD among patients with ESRD.

METHODOLOGY

Research Design

A quantitative approach employing a quasi-experimental one-group pretest and posttest design was used in this study.

Setting of the Study

The research was conducted in a selected nephrourology unit of a tertiary care hospital.

Population

The study population included all patients diagnosed with ESRD and receiving PD.

Sample Size

A total of 60 participants were included in the study [4].

Sampling Technique

Participants were chosen using purposive sampling based on predefined inclusion criteria.

Inclusion Criteria

- Patients diagnosed with ESRD and undergoing PD
- Age between 18 and 70 years
- Patients willing to participate
- Patients able to communicate effectively

Exclusion Criteria

- Critically ill patients

- Patients with cognitive impairment
- Patients who have already undergone formal PD training recently

Data Collection Tools

1. *Structured knowledge questionnaire*
 - 30 multiple-choice questions
 - Areas: PD procedure, infection control, complications, care of the catheter
2. *Observational practice checklist*
 - 25 steps related to the PD procedure
 - Scoring based on correct performance

Intervention

An STP was developed, which included:

- Introduction to PD
- Step-by-step procedure demonstration
- Infection prevention techniques
- Complication management
- Hands-on demonstration and return demonstration [5].

Duration: 45–60 minutes per session.

Data Analysis

The data were examined using both descriptive and inferential statistical methods, such as the mean, standard deviation, paired t-test, and chi-square test [6].

RESULTS

Demographic Characteristics

The data presented in Table 1 show the age-wise distribution of patients undergoing PD. The majority of participants, 28 (46.7%), were aged 31–50 years. This was followed by 22 (36.6%) patients in the 51–70 years age group, while the least number of patients, 10 (16.7%), were in the 18–30 years age group. This indicates that most patients requiring PD were middle-aged adults.

Pretest and Posttest Knowledge Scores

Table 2 presents the gender and educational backgrounds of the study participants. Regarding sex distribution, male participants formed the majority of the study sample, with 38 patients (63.3%), whereas female participants accounted for 22 patients (36.7%). Regarding educational status, most participants had secondary education, 25 (41.7%), followed by 20 (33.3%) with primary education. Only 15 (25.0%) participants were graduate students. This indicates that most patients had moderate educational attainment, which may influence their understanding of the PD procedure [7].

Table 3 shows a comparison between the mean knowledge scores obtained before and after the implementation of the STPs among patients receiving PD. The pretest results showed that the mean knowledge score was 11.45 with a standard deviation of 3.21, indicating that the participants' initial level of knowledge was relatively low.

After the intervention, a marked improvement was observed in the posttest scores, where the mean knowledge score increased to 21.78, with a reduced standard deviation of 2.64. This improvement suggests that the participants gained a better understanding and clarity regarding PD procedures following the STPs.

Table 1. Age-wise distribution of ESRD patients (n=60).

Variable	Category	Frequency (n=60)	Percentage (%)
Age	18–30 years	10	16.7
	31–50 years	28	46.7
	51–70 years	22	36.6
Gender	Male	38	63.3
	Female	22	36.7
Education	Primary	20	33.3
	Secondary	25	41.7
	Graduate	15	25.0

Table 2. Gender and educational status of ESRD patients (n=60).

Level of knowledge	Pretest (%)	Posttest (%)
Poor	40%	5%
Average	45%	25%
Good	15%	70%

Table 3. Comparison of pretest and posttest knowledge scores regarding PD among ESRD patients.

Test	Mean	SD	t-value
Pretest	11.45	3.21	18.62*
Posttest	21.78	2.64	

*Significant at $p < 0.05$ **Table 4.** Pretest and posttest practice levels regarding PD among ESRD patients (n=60).

Practice level	Pretest (%)	Posttest (%)
Poor	38%	8%
Average	47%	27%
Good	15%	65%

The obtained paired t-test value was 18.62, and the result was statistically significant ($p < 0.05$). This demonstrates a significant difference between the pretest and posttest knowledge scores. Therefore, the STPs proved to be effective in enhancing the knowledge of patients with ESRD regarding PD.

Pretest and Posttest Practice Scores

Table 4 shows the distribution of patients' practice levels before and after the implementation of the STPs. During the pretest evaluation, the majority of participants (47%) exhibited an average level of practice, whereas 38% demonstrated poor practice, and only 15% had good practice in performing PD procedures [8].

After the structured teaching intervention, a considerable improvement in practice levels was observed among participants. The proportion of patients demonstrating good practice increased markedly to 65%, whereas the percentage with average practice declined to 27%. In addition, the number of participants with poor practices decreased significantly to 8%. These results highlight the positive impact of the educational program on enhancing the practical performance of patients undergoing PD.

Table 5 compares the mean practice scores obtained before and after the implementation of the STPs. The mean pretest practice score was 10.92 ± 2.87 , showing that the participants initially had insufficient practical skills related to PD procedures.

Table 5. Comparison of pretest and posttest practice scores regarding PD among ESRD patients.

Test	Mean	SD	t-value
Pretest	10.92	2.87	17.34*
Posttest	20.35	2.41	

Following the educational intervention, the mean posttest practice score increased considerably to 20.35 ± 2.41 , indicating a noticeable enhancement in patients' competency and performance of the PD techniques [9].

The paired t-test analysis yielded a value of 17.34, which was statistically significant at $p < 0.05$. This result confirms a significant improvement between the pretest and posttest practice scores, thereby proving the effectiveness of the STPs in enhancing the practical abilities of patients with ESRD.

ASSOCIATION BETWEEN KNOWLEDGE AND DEMOGRAPHIC VARIABLES

A statistically significant relationship was observed between the knowledge scores and the educational status of participants ($\chi^2 = 9.21$, $p < 0.05$). However, no meaningful association was identified between knowledge scores and variables such as age and gender.

DISCUSSION

The present study revealed a marked improvement in the knowledge and practical skills of PD among patients with ESRD following the structured teaching intervention. These findings indicate that organized educational programs are effective in improving patients' understanding and their ability to carry out dialysis procedures accurately. The increase in knowledge scores suggests that patients gained a better understanding of the important components of PD, including aseptic techniques, dialysis exchange procedures, and methods for preventing complications. These results are consistent with earlier nursing research emphasizing the vital role of patient education in the management of chronic illnesses. In addition, the improvement in practice scores demonstrated that patients became more competent in correctly performing dialysis-related procedures. Accurate practice is crucial for minimizing complications, such as peritonitis, which is recognized as one of the leading causes of PD technique failure [10].

The study also identified a significant relationship between patients' educational status and their knowledge scores, indicating that the literacy level greatly influences the understanding of complex medical procedures. This finding underscores the importance of developing simple and easy-to-understand teaching materials for patients with limited educational backgrounds. Overall, structured teaching proved to be an effective nursing intervention for improving both the cognitive and psychomotor domains of patients undergoing PD.

CONCLUSION

The study findings indicated that STPs were highly effective in enhancing both the understanding and practical skills related to PD among patients with ESRD. Continuous patient education should be integrated into routine nephrology nursing care to ensure better adherence, reduce complications, and improve the quality of life.

Recommendations

- Regular educational sessions should be conducted for PD patients.
- Visual aids and demonstration-based teaching should be emphasized.
- Family members should also be included in training programs.
- Periodic evaluation of patient skills should be implemented.
- Larger multicentric studies should be conducted for generalization.

Limitations

- The study was limited to a single hospital setting.
- The sample size was relatively small.
- Long-term follow-up was not conducted.
- Self-reported data may have response bias.

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