

**PATIENT SAFETY AND INFECTION CONTROL**  
**ASSESSMENT OF THE PKU MUHAMMADIYAH HOSPITAL**  
**HEMODIALYSIS CENTER: A BASIS FOR NURSING CARE**  
**PROGRAM**

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**Abstract**

The aim of this study was to assess nursing care practice in the hemodialysis center of PKU Muhammadiyah hospital Indonesia, in term of patient safety and infection control.

Descriptive research method was employed to assess the implementation of hemodialysis procedure and managerial control in PKU Muhammadiyah hospital of Yogyakarta Indonesia. There were 30 hemodialysis patients who were purposively selected and recruited from the center. The questionnaire served as the major research instrument on this study.

The hemodialysis patients indicated that hemodialysis center of PKU Muhammadiyah Yogyakarta Indonesia has been prepared well for all of the aspects of safety and infection control in both procedure and managerial control. Most of nurses and health care provider are aware to provide best care for their patients along the process of care including psychological aspect such as religious practice.

It is significantly important to assess nursing care practice based on the point of view of patients as the evaluation process. The result can be as data base to improve quality of nursing care.

**Keywords:** patient safety, infection control, nursing care

## **Introduction**

Renal failure is a condition in which the kidneys fail to remove metabolic end products from the blood and regulate the fluid, electrolyte, and pH balance of the extracellular fluids. The underlying cause may be renal disease, systemic disease, or urinary tract disorders of nonrenal origin. Renal failure can occur as an acute or a chronic disorder. Acute renal failure is abrupt in onset and often is reversible if recognized early and treated appropriately. In contrast, chronic renal failure is the end result of irreparable damage to the kidneys. It develops slowly, usually over the course of a number of years.<sup>1</sup>

Renal failure develops when the GFR is less than 20% to 25% of normal. At this point, the kidneys can no longer regulate the volume and solute composition of the extracellular fluids, and edema, metabolic acidosis, and hyperkalemia begin to appear. End-stage renal disease (ESRD) occurs when the GFR is less than 5% of normal. At this final stage of renal failure, treatment with dialysis or transplantation becomes necessary for survival.<sup>2</sup>

Renal disease is globally recognized today as one of the top leading health problems. The number of patients with Chronic Renal failure (CRF) and subsequent need for renal replacement therapy (RRT) has reached epidemic where there is less availability of and access to dialysis services, and its proportion is anticipated to rise further. There was a time when the diagnosis of end-stage-renal disease (ESRD) or Chronic Renal failure (CRF) was equated with death sentence. It is estimated worldwide that over 1.1 million patients with end-stage renal disease (ESRD) currently require maintenance dialysis, and this number is fast increasing at a rate of 7% per year. If the trend continues, the number will exceed 2 million by 2010. This figure excludes developing countries therefore an underestimate of the true demand.<sup>3</sup>

End-Stage Renal Disease (ESRD) is the seventh leading cause of death in Indonesia, making hemodialysis an ever-increasing treatment modality. The number of people requiring hemodialysis and transplantation has increased significantly in Indonesia during the past decade. Individuals who developed ESRD must confront many life-style challenges that present a variety of choices related to diet, medication, and activity. In Indonesia, many individuals prior to resorting to dialysis first choose herbal medicine to treat their ESRD.<sup>4</sup>

In Yogyakarta, one of the big cities located at Java Island Indonesia, the number of patients with Chronic Renal failure is increasing. There are 4 big hospitals including Pembina Kesejahteraan Umat Muhammadiyah Yogyakarta that have Hemodialysis service. As one of the big private hospitals in Yogyakarta, it has about 100 patients every month receiving hemodialysis therapy. Based on the interview with some of the patients, they said that

sometimes they feel impending death to come anytime making their lives miserable. However, they do not have other choice but to continue living.

Hemodialysis is a complicated, demanding, and expensive treatment. It is an integral part of a transplant program. It may be necessary to prepare the patient for surgery, maintain him through post-operative oliguria, or sustain his life following transplant failure.<sup>5</sup> To reduce the risk of CRF, the patient should be closely observed and should receive adequate treatment to control or slow the problems before they progress to ESRD.

This study sought to assess the PKU Muhammadiyah Hospital Hemodialysis Center as basis for a nursing care program. The nursing process is a systematic method by which nurses plan and provide care for patients. This involves a problem solving approach that enables the nurse to identify patient problems and potential problems. The nursing process consists of six dynamic and interrelated phases: assessment, diagnosis, outcomes identification, planning, implementation, and evaluation.<sup>5</sup>

The study employed the descriptive research method to assess the implementation of hemodialysis procedure and managerial control in PKU Muhammadiyah hospital of Yogyakarta Indonesia.

The respondents of this study were 30 patients who were purposively selected and recruited from the haemodialysis center and were clinically expected to require dialysis within the next 6 months. Inclusion criteria were: the patients should have been diagnosed with CRF for at least 6 months, they should have had AV shunt, and have performed haemodialysis for 6 times or more.

Responses from the questionnaire were validated through documentary analysis (records review), observation and interviews. Documents obtained include standard operating procedure (SOP) in the hemodialysis center, logbooks of nurses, and medical records of patients. Responses to close-ended questions are presented as frequencies and percent. On the other hand, answers to open-ended questions were summarized categorically; some were presented in tabular form (as frequencies / percent) while others were just presented in narrative form.

## Result

**Table 1**  
**Distribution of Patient According to Variables Relative to their**  
**Entry in the Hemodialysis Center at PKU Muhammadiyah**

<b>Schedule for the procedure</b>	<b>n</b>	<b>Percentage</b>
1 time/week	1	3%
2 times/week	26	87%
3 times/week	3	10%
<b>Total</b>	<b>30</b>	<b>100%</b>
<b>Waiting time for the procedure</b>	<b>n</b>	<b>Percentage</b>
5 – 15 minutes	18	60%
16 – 35 minutes	12	40%
<b>Total</b>	<b>30</b>	<b>100%</b>
<b>Comfort of waiting place</b>	<b>n</b>	<b>Percentage</b>
Comfortable	14	47%
Uncomfortable	16	53%
<b>Total</b>	<b>30</b>	<b>100%</b>
<b>Method of getting health education</b>	<b>n</b>	<b>Percentage</b>
Patient got health education during the discharge	17	57%
Patient got health education during the procedure	13	43%
<b>Total</b>	<b>30</b>	<b>100%</b>
<b>Topic of health education</b>	<b>n</b>	<b>Percentage</b>
Diet	25	83%
Complication	2	7%
Medication	2	7%
Others	1	3%
<b>Total</b>	<b>30</b>	<b>100%</b>

Table 1 shows the frequency and percentage distribution of patient based on variables related to their entry in the hemodialysis center at PKU Muhammadiyah including schedule for the procedure, waiting time for the procedure, comfort of waiting place, method of getting health education, and topic of health education given.

It can be noted from the table that the schedule of the patients for performing hemodialysis varies. Most of the patients (87%) have a schedule of 2 times a week. According to Brunner and Suddarth's 2008, the frequency of hemodialysis depends on the patient condition, including the weight of the patient, the type of dialyzer used, the rate of blood flow, and the personal preference of the patient. <sup>1</sup>

Based on the waiting time for the procedure, it was noted that time needed for preparing the hemodialysis machine after being used by other patients is mostly about 5 to 15 minutes (for 60% of the patient) while the other 40% indicated they wait for about 16 to 35 minutes for the preparation of the hemodialysis machine. It can be recalled that all of the hemodialysis nurses in PKU Muhammadiyah, Yogyakarta were duly trained for hemodialysis and majority (83%) have at least 1 year of experience in handling hemodialysis patients and the hemodialysis machine. This makes the nurses more capable to prepare for the procedure in a shorter time compared with nurses who lack experience and proper training.

According to comfort of the waiting place, it was noted that 16 out of the 30 patient (53%) feel uncomfortable with the waiting place provided. This center has one big place for waiting patients outside of the Hemodialysis Center, with only 10 chairs provided. It has no air conditioning unit because it is an open area covered only with a roof. The waiting place was previously a parking area. Based on an interview with a family member of a patient-respondent, the patients as well as their relatives are not comfortable with the waiting place because the chairs are not enough and the environment is very noisy. According to U.S. Department of Health and Human Services Centers for Disease Control and Prevention (CDC) 2003, heating, ventilation, and air conditioning (HVAC) systems in health-care facilities are designed to a) maintain the indoor air temperature and humidity at comfortable levels for staff, patients, and visitors; b) control odors; c) remove contaminated air; d) facilitate air-handling requirements to

protect susceptible staff and patients from airborne health-care-associated pathogens; and e) minimize the risk for transmission of airborne pathogens from infected patients.

In terms of method of getting health education while undergoing hemodialysis, it was noted that more patient (57%) got health education during discharge while 43% got health education during the procedure. Health education may be given to the patient by the nurses, medical doctor, and nutritionist. PKU Muhammadiyah has a schedule to give the patient information about diet, fluid, activities that are given every month for all of the hemodialysis patients. According to Brunner and Suddarth's that the method of giving information are varies, aside from giving information orally, the center provided leaflets / pamphlets for the patient as information resources. In terms of topics of health education given by health care provider, it was noted that majority of the respondents (83.3%) get information about diet, which is a very important factor for the patient because of the effect of uremia. Goals of nutritional therapy are to minimize uremic symptoms, fluid, and electrolyte imbalance. This could prevent complications.<sup>6</sup>

**Table 2**  
**Distribution of Patient According to Variables Relative to**  
**Infection Control in the Performance of Hemodialysis Procedure in the**  
**Hemodialysis Center of PKU Muhammadiyah**

<b>Observation of patients on nurses' wearing gloves during the procedure</b>	<b>n</b>	<b>Percentage</b>
Patient saw nurses wearing gloves during the procedure	30	100%
Patient did not see nurses wearing gloves during the procedure	0	0%
<b>Total</b>	<b>30</b>	<b>100%</b>
<b>Observation of patients on nurses' washing of their hands</b>	<b>n</b>	<b>Percentage</b>
Patient saw nurses washing their hands before and after the procedure	29	97%
Patient did not see nurses washing their hand before and after the procedure	1	3%
<b>Total</b>	<b>30</b>	<b>100%</b>

<b>Provision of information about CRF and ESRD</b>	<b>n</b>	<b>Percentage</b>
Patients are informed about CRF and ESRD during the procedure	29	97%
Patients are informed about CRF and ESRD during the consultation	1	3%
<b>Total</b>	<b>30</b>	<b>100%</b>
<b>Patients' AV shunt care</b>	<b>n</b>	<b>Percentage</b>
Do not put pressure on AV shunt	7	24%
Make clean	10	33%
Minimal activities on AV shunt	13	43%
<b>Total</b>	<b>30</b>	<b>100%</b>
<b>Persons who give information about AV shunt care</b>	<b>n</b>	<b>Percentage</b>
Nurse	30	100%
Medical Doctor	0	0%
Other health care provider	0	100%
<b>Total</b>	<b>30</b>	<b>100%</b>

Table 2 presents the frequency and percentage distribution of respondents according to their responses to items related to infection control. Based on the Table 2, all of the patient (100%) saw all of the hemodialysis nurses wearing gloves during the hemodialysis procedure. Wearing gloves during the procedure is one of the universal precautions that would protect both nurses and patients from nosocomial infection, because during the procedure nurses always have contact with the blood and body fluid of the patient. All health care workers should routinely use appropriate barrier precautions to prevent skin and mucous membrane exposure during contact with any patient's blood or body fluids that require universal precautions.<sup>7</sup>

Gloves should be worn: for touching blood and body fluids requiring universal precautions, mucous membranes, or no intact skin of all patients, and for handling items or surfaces soiled with blood or body fluids to which universal precautions apply. Gloves should be changed after contact with each patient (CDC Guidelines for Isolation Precautions in Hospitals, 1988)

In terms of the nurses washing their hands, almost all of patient, except for one (1), saw nurses are washing their hands before and after the procedure. However, based on the

researcher's actual observation, all nurses wash their hands before and after every contact with the patients. The nurses in the hemodialysis center are aware of the universal precaution in terms of washing their hands. Washing hands is very important before and after the procedure to protect patients and also nurses from infections. Hands and other skin surfaces should be washed immediately or as soon as patient safety permits if contaminated with blood or body fluids requiring universal precautions. (CDC Guidelines for Isolation Precautions in Hospitals, 1988)

In terms of provision of information about CRF and ESRD, Table 2 also shows that all of the patient, except for one (1), are informed about their disease during the procedure. As mentioned in Table 1, the only patient who does not receive information about his disease during the procedure does not really want to know about his disease, he just goes through the process of hemodialysis. According to Brunner and Suddarth's, 2008 health education is important to nursing care because it affects the abilities of people and families to perform important self-care activities. Every contact an individual nurse has with a health care consumer, whether or not that person is ill, should be considered on opportunity for health teaching. Although people have right to decide whether or not to learn, nurses have the responsibility to present information that motivates people to recognize the need to learn. Patients needed information to be provided earlier in their illness, especially before the initiation of dialysis. They also wanted more information about their prognosis and illness, specifically, how interventions could sustain roles and relationships.

**Table 3**  
**Distribution of Patient According to**  
**Variables Relative to their Patient and Staff Safety in Performing**  
**Hemodialysis Procedure in the Hemodialysis Center of PKU Muhammadiyah**



<b>Patients' Feeling of Safety during the procedure</b>	<b>n</b>	<b>Percentage</b>
Patient feels safe	29	97%
Patient feels unsafe	1	3%
<b>Total</b>	<b>30</b>	<b>100%</b>
<b>Patients' Feeling of Comfortable with the nurses</b>	<b>n</b>	<b>Percentage</b>
Patient feels comfortable	30	100%
Patient feels uncomfortable	0	0%
<b>Total</b>	<b>30</b>	<b>100%</b>
<b>Reason for Choosing the Hemodialysis Center</b>	<b>n</b>	<b>Percentage</b>
Insurance	11	37%
Referral	2	7%
Islami	5	16%
Good performance	12	40%
<b>Total</b>	<b>30</b>	<b>100%</b>
<b>Communication with the nephrologist</b>	<b>n</b>	<b>Percentage</b>
Patient never communicate with the nephrologist	1	3%
Patient has consult with the nephrologist once/week	18	60%
Patient has consult with the nephrologist 2 times/week	10	34%
Patient has consult with the nephrologist 3 times/week	1	3%
<b>Patient's compliance to the diet program</b>	<b>n</b>	<b>Percentage</b>
Patient follow diet program	27	90%
Patient did not follow diet program	3	10%
<b>Total</b>	<b>30</b>	<b>100%</b>
<b>Water consumption every day</b>	<b>n</b>	<b>Percentage</b>
Patient consume 1 L/day of water	22	73%
Patient consume 2 L/day of water	8	27%
<b>Total</b>	<b>30</b>	<b>100%</b>
<b>Persons who remind the patient to pray</b>	<b>n</b>	<b>Percentage</b>
Health care provider	4	13%
Family	20	67%
None (only self)	6	20%
<b>Total</b>	<b>30</b>	<b>100%</b>

Table 3 presents the frequency and percentage distribution of the patient according to perceptions on patient and staff safety. In terms of perceived feelings of safety in the Hemodialysis Center, it was noted that almost all of the respondents (97%) feel safe. This may

be because the hospital provides competent staff to handle the patients. As for their feeling of comfort in the unit, all of the patient feel comfortable in the Hemodialysis Center. Based on interviews with the patient, they said that the cleanliness of the room is always maintained and that there is good ventilation with the presence of an air conditioner. Moreover, the patients feel comfortable because they can share and discuss with other people who are suffering the same disease. They can also share their experiences to resolve some problems and express their feelings without barriers.<sup>8</sup>

In terms of reason for choosing the Hemodialysis Center in PKU Muhammadiyah, it was noted that 40% of the respondents chose the said center for its 'good performance.' This is one indicator of service quality. The patient are deemed to give a valid appraisal on this matter because they obtained actual experience on the hemodialysis procedure in the said center. The second most common reason for choosing the Hemodialysis Center in PKU Muhammadiyah is the patient' health insurance (for 37% of the patient). With the insurance, the patient-respondent will get service without really thinking about the expenses because these shall be shouldered by the insurance provider. Also, some respondents (16%) choose the unit because it is an Islami hospital. Because most of the population in Yogyakarta are Muslim, they feel comfortable to practice their religion because the hospital provides a prayer room inside.<sup>9</sup>

In terms of communication or consultation with their doctor, it was noted from Table 16 that 60% of the patient communicate with a nephrologist once a week to discuss and share about their disease while 34% of the patient communicate with a nephrologist 2 times per week. As in previous tables, there is one (1) patient-respondent who does not want to communicate with the nephrologist. Based on further interview done by the researcher with the patient, the said patient feels lonely, not being able to make his parents proud of him. Acceptance of hemodialysis as a lifelong treatment is very important to make patients accept their condition, thus, they will

become cooperative with the treatment given. Communication with health care providers is an important aspect for patients to express their feeling about the disease

According to Brunner and Suddarth's, 2008 emotional readiness also affects the motivation to learn. A person who has not accepted an existing illness or threat of illness is not motivated to learn. A person who does not accept a therapeutic regimen, or who views it as a conflicting with his or her present lifestyle, may consciously avoid learning about it.

In terms of compliance to the recommended dietary program for hemodialysis patients, it was noted from Table 17 that 10% of the patients did not follow the dietary program because dietary restriction is an unwelcome change in their lifestyle. This is probably because of some difficulty among patients to consume certain foods suggested to them. However, majority of the patient (90%) follow the recommended diet to them, which is appropriate to their needs and condition. Many patients need ongoing education and reinforcement on the multiple dietary restrictions required, including fluid, sodium, potassium, and protein restriction. Reminders about the need for health promotion activities and health screening are an important part of nursing care for the patient with renal failure.<sup>1</sup>

In terms of the patient' daily water consumption, it was noted that most of patient (73%) consumed water 1 liter of water every day, following the standard for hemodialysis patient care that maximum water consumption is 1 liter per day only to prevent complication such as cardiac disorder or lung edema. However, 8 out of 30 patients (7%) consume 2 liters of water per day. Thus, health education regarding water consumption should be prioritized because of the possible side effect or complication of too much water consumption. Restriction of fluid or food, pain, itching, discomfort, limitation of physical activities, fatigue, weakness, cost of care, feelings of inadequacy and negative moods were identified as the major physiological and psychological stressors.<sup>10</sup>

Lastly, the patient' family members are mostly (for 67% of the respondents) the ones who person who remind the patients to pray. Indeed, the family plays a great role in the support system of the patients. Also, spiritual aspect is very important in order to have positive thinking and positive feeling that everything is from God and will come back to God. This hospital also provided prayer room, because most of the patients and their family are Muslim, although there are also patients with different religions. When faced with critical illness or a terminal prognosis, and especially when they find themselves in the strange and demanding hospital environment, patients and families certainly worry about death and hope and pray for recovery. In some circumstances, when death can be anticipated or acknowledged as likely or possible, "spiritual" needs and expression become obvious in the hospital environment.<sup>11</sup>

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