

THE IMPACT OF NUTRITIONAL SCREENING ON PERITONEAL DIALYSIS USERS BY NURSES: A SYSTEMATIC REVIEW

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Abstract

Background: Continuous Ambulatory Peritoneal Dialysis (CAPD) patients deserve special attention due to metabolic changes in response to Chronic Kidney Disease (CKD) which affects their nutritional status. Assessment of nutritional status through screening carried out by Peritoneal Dialysis (PD) nurses is expected to be able to improve nutritional status and avoid complications of malnutrition. **Purposes:** This review and meta-analysis were carried out to determine whether there is a clinical advantage as the impact to do the nutritional screening to CAPD users. **Method:** The method used was critical document review of PRISMA Analysis as a systematic review through 103 document searches, identifying keywords and reviewing articles from Google Scholar, Research Gate and PubMed. Characteristics of the studies under the search were: nursing on CAPD users, CKD cases, nutrition assessment, roles of CAPD nurses and nutritional screening methods. **Result:** Out of 103 records under the search protocol, records screened (n:64), Google Scholar: (n:36), Research Gate (n:12), PubMed (n:12), records removed (n:61), retrieved (n:41), assessed for eligibility (n:21) and records included in the study review (n:17). By using meta-analysis, 17 records were under included of PRISMA and the studies demonstrate clinically and professionally beneficial. The study suggests Subjective Global Assessment (SGA) screening method for CAPD patient to be used by CAPD nurses.

Keywords: Nutritional Screening, Peritoneal Dialysis, CAPD Nurses.

DAMPAK SKRINING NUTRISI PADA PASIEN PERITONEAL DIALYSIS OLEH PERAWAT: A SYSTEMATIC REVIEW

Latar Belakang: Pasien *Continuous Ambulatory Peritoneal Dialysis* (CAPD) perlu mendapat perhatian khusus karena adanya perubahan metabolik sebagai respons terhadap *Chronic Kidney Disease* (CKD) yang mempengaruhi status gizinya. Pengkajian status gizi melalui skrining yang dilakukan oleh perawat *peritoneal dialysis* (PD) diharapkan mampu meningkatkan status gizi dan terhindar dari komplikasi gizi buruk. **Tujuan:** Review dan meta-analisis ini dilakukan untuk mengetahui apakah ada keuntungan klinis sebagai dampak dari melakukan skrining gizi pada pengguna CAPD. **Metode:** Metode yang digunakan adalah review dokumen dengan pendekatan Analisis PRISMA sebagai tinjauan sistematis melalui 103 pencarian dokumen, mengidentifikasi kata kunci dan meninjau artikel dari Google Scholar, Research Gate dan PubMed. Karakteristik penelitian yang diteliti adalah: keperawatan pada pengguna CAPD, kasus CKD, penilaian gizi, peran perawat CAPD dan metode skrining gizi. **Hasil:** Dari 103 artikel yang diperoleh melalui protokol pencarian, kemudian diskruining (n:64), *Google Cendekia*; (n:36), *Research Gate*; (n:12), *PubMed* (n:12), artikel yang dihapus (n:61), diambil (n:41), dinilai kelayakannya (n:21) dan artikel yang direview (n:17). Dengan menggunakan meta-analisis, 17 artikel dimasukkan dalam analisis PRISMA dan Hasilnya skrining nutrisi menunjukkan manfaat secara klinis dan profesional. Penelitian ini menyarankan metode skrining *Subjective Global Assessment* (SGA) untuk pasien CAPD untuk digunakan oleh perawat CAPD.

Kata kunci: Skrining Nutrisi, Dialisis Peritoneum, Perawat CAPD

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Background

Patients with chronic kidney disease are at substantial risk for malnutrition, characterized by protein energy wasting and micronutrient deficiency (Iorember, 2018). The occurrence of malnutrition, among others, is due to decreased appetite, loss of nutrients into the dialysate fluid, catabolism, inflammation (Prasad et al., 2007). Meanwhile, the factors that influence the reduction of food intake in CKD patients with dialysis therapy are the presence of gastrointestinal disorders, nausea and anorexia and loss of protein during dialysis (Lajuck et al., 2016). A new paradigm of patient care for Peritoneal Dialysis (PD) is placing patients in multidisciplinary teams (Kiebalo et al., 2020). PD treatment requires collaboration between a team of nephrologists, nutritionists, nurses and patients. Various parameters in managing PD have been defined, one of which is an assessment of Nutritional Status. PD nutrition guidelines recommend regular and thorough nutritional intake, including evaluation of the patient's appetite, measurement of body weight, clinical status as well as food intake and laboratory tests (albumin, potassium, bicarbonate and phosphate) (Kiebalo et al., 2020). In patients with CKD, malnutrition is a major problem that often occurs due to inadequate nutrient intake. To prevent a decline and maintain the nutritional status of CKD patients, it is necessary to support a special diet by using a Standardized Nutritional Care Process approach (Ikizler et al., 2020). This approach is a systematic problem-solving method, in which nutritionists make decisions to treat chronic kidney failure, so as to provide safe, effective and high-quality nutritional care. However specific

dietary guidelines have not been made clear from a nursing perspective as part of a CAPD health care team. It is recognized that dietary recommendations are not universal and, moreover, are influenced by many factors (Kiebalo et al., 2020). So far there is no data on the number of CAPD users who are malnourished (IRR, 2018). This is where the importance of assessing the nutritional status of patients on peritoneal treatment is dialyzed. In the early stages of nursing assessment, nurses have a major role to help determine patient's nutritional level. This study tries to explore the existence of malnutrition screening tools in the nursing of PD patients carried out by CAPD nurses, since nutritional disorders in CAPD users can be detected as early as possible and receive immediate treatment that clinically gives them advantages.

METHODS

This study used PRISMA Analysis as a systematic review. The research was conducted through document searches, identifying keywords and reviewing articles from Google Scholar, Research Gate and PubMed. The initial search yielded 58.000 hits in 0.46 second in Google Search, from which 103 randomized materials fell under the scope of the search protocol. The characteristics of studies were: nursing on CAPD users, CKD cases, nutrition assessment, roles of CAPD nurses and nutritional screening methods. The authors identified these 5 characteristics to descriptive method because the data and information collected focuses attention on actual phenomena and problems. Out of 103 materials in the database of the protocol, records to be

screened, segregate into Google Scholar, Research Gate, PubMed, records to be removed, retrieved, assessed for eligibility and records to be included in the study review, as per Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) Flow Diagram. By conducting this review and meta-analysis, we tried to obtain a definite answer whether the impact of nutritional screening for CAPD users by nurses clinically beneficial. The results were used to describe an objective empirical state of the phenomenon or problem being studied. The data collection technique used was literature study supported by descriptive design. This method was applied because of various limitations in interviewing directly with authoritative sources. A similar method was used on PD cases (Hagen et al., 2014). The results were obtained by following the PRISMA's steps of analysis. The data were divided into: Identification (records identified from database and records removed), Screening (records screened and records excluded; records sought for

retrieval and not retrieved; assessed for eligibility and records excluded) and Included (studies included in the review).

RESULTS

Out of 103 papers identified in the initial search, 64 fell within the scope of the search protocol, 39 documents were removed. No additional studies were included after manually scrutinizing reference lists. The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flow diagram for systematic reviews is presented in Figure 1. The assessment of the quality of the included studies is presented in Table 1, a meta-analysis which was performed using a total of 17 studies, compiling 5 characteristics: nursing on CAPD users, CKD cases, nutrition assessment, roles of nurses and nutritional screening methods. The role of CAPD nurses is presented in Table 2, and The Nutritional Screening Flow is presented in Figure 2.

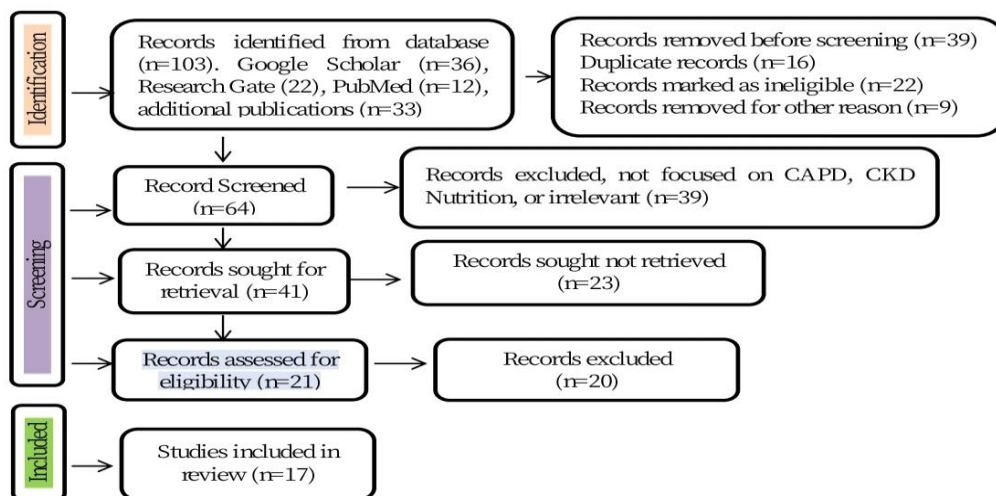


Figure 1: Result Analysis Based on PRISMA Flow Diagram

The figure above shows from the Identification stage there were 103 documents recorded in which 64 records were screened and 39 excluded due to not focused or irrelevant. The records were

sought for retrieved 41 documents and not retrieved 23 records. Then they were assessed for eligibility 21 documents, yet 17 studies were included in the review as seen in the Table 1 below.

Table 1: Studies Characteristics Included for Review

No.	Authors	Document Title	Nursing on CAPD Users	CKD Cases	Nutrition Assessment	Roles of CAPD Nurses	Nutritional Screening Methods
1	Davita Kidney Care, (2021)	Nurses: Taking Care of Patients at the Dialysis Center	X			X	
2	NIPEC, (2021)	PD Nurse Specialist: Job/Role Summary	X			X	
3	Yetti, (2007)	Nurses' Roles in Enhancing the Quality of Peritoneal Dialysis Patients	X	X	X	X	
4	Wi & Kim (2017)	Assessment of Malnutrition of Dialysis Patients and Comparison of Nutritional Parameters of CAPD and Hemodialysis Patients		X	X		X
5	Riani et al. (2019)	Relationship between Energy and Protein Intake with Nutritional Status Based on% LILA by Age in Chronic Kidney Disease on Hemodialysis Patients at Dr. Saiful Anwar Malang.		X	X		
6	Ullu et al. (2018)	The Relationship between Nutritional Status and Quality of Life Undergoing Chronic Kidney Failure Patients Hemodialysis at Prof. Dr. W. Z. Johannes Hospital		X	X		
7	Herawati & Ariyanto (2014)	Medical Policy In Patients With Chronic Renal Failure Hemodialysis At Hasan Sadikin Bandung Hospital		X	X		
8	Maulida et al. (2019)	Adequate nutrition intake to improve nutritional status of hemodialysis patient using dialysis malnutrition scores.		X	X		X
9	BPPSDM (2018)	Training Curriculum of Continuous Ambulatory Peritoneal Dialysis (CAPD) For Nurses	X	X	X	X	
10	Ashra &	Comparison of Nutritional			X		X

	Rina (2017)	Status Assessment Using MST (Malnutrition Screening Tool) and SGA (Subjective Global Assessment) in Assessing Nutritional Status Against the Injury Occurrence in the Patient In the Intensive Care Unit (ICU) Room Achmad Mochtar Hospital				
11	Liakopoulos & Dounousi (2020)	Editorial: Nutrition Management for Chronic Kidney Disease	X	X		X
12	Han & Han (2012)	Nutrition in patients on peritoneal dialysis	X	X		X
13	Kiebalo et al. (2020)	Nutritional Guidelines, Adequacy and the Management of Malnutrition	X	X		X
14	Lajuck et al. (2016)	Nutritional status in patients with stage 5 chronic kidney disease who undergo adequate and inadequate hemodialysis.	X	X		X
15	Prasad et al. (2007)	Impact Of Nutritional Status On Peritonitis In CAPD Patients	X	X		X
16	Hermalia et al. (2019)	Hemodialysis Nurses Competencies.	X	X	X	X
17	IPDI (2017)	Dialysis Nurses Standard Competency	X	X		X

The above table demonstrates the last stage of the PRISMA analysis in which 17 records were reviewed. The studies' characters were: nursing on CAPD users, CKD cases, nutrition assessment, roles of

nurses and nutritional screening methods. Out of 17 records, 3 records contain 4 characters (17.6%), 8 records contain 3 characters (47.05%) and 6 records contain 2 characters (35.29%).

Table 2: Roles and Responsibilities of CAPD Nurses

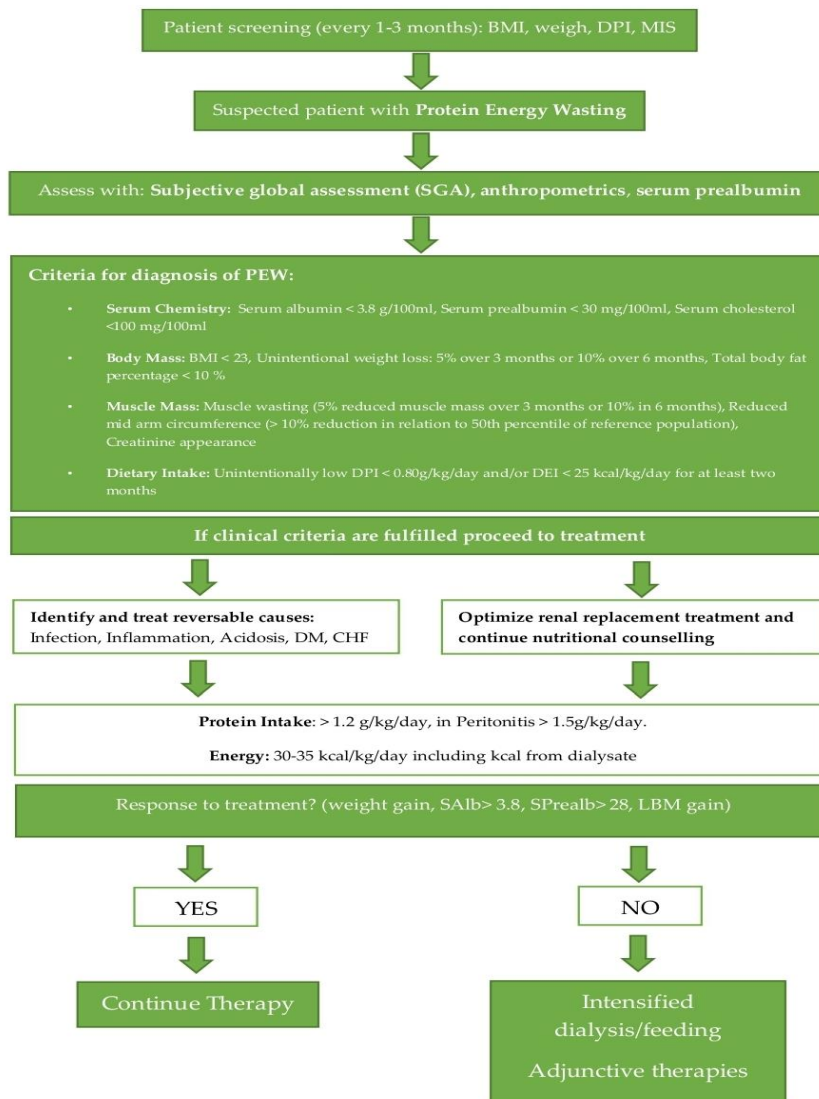
No.	Main Duties and Responsibilities of PD Nurses
1	Assess the patients' condition.
2	Teach patients also nurses how to do peritoneal dialysis in the home setting.
3	Consider the patients' learning needs and provide education about their treatment.
4	Make a training plan for each patient.
5	Give the patients the medications ordered by their doctors.
6	Evaluate the patients' ability to perform their dialysis treatments and take all doctor-prescribed medications.
7	Help patients follow-up with their PD center.
8	Review the patients' lab work, home medications and activities and let the doctors know about changes in their patients' conditions
9	Teach their patients how to perform their own treatments at home and give them the knowledge to know what to do if any complications occur during their treatment.

- 10 Checking the patients' vital signs and talking with them to assess their condition
- 11 Overseeing the dialysis treatment from start to finish.
- 12 Making sure patients are given the correct medications ordered by their doctors.
- 13 Evaluating patients' reaction to the dialysis treatment and medications.
- 14 Helping patients follow-up with their transplant center.
- 15 Supporting the entire care team in delivering quality care in a considerate, respectful manner.
- 16 Organizing and aiding best practice regarding catheter placement , care post op.
- 17 Coordinate the treatment of patients who suffer from peritonitis.
- 18 Organize and run clinics to review patient’s treatment, carry out test, follow up and act upon results to ensure adequacy of dialysis is maintained as well as general well-being and to carry out routine procedures e.g. line changes.
- 19 Case management of PD patients within the trust.

Source: Davita Kidney Care (2021)

The Table above represents the general principle of Nursing Care Plan which include Planning (Point No.1, 2, 3, 10 and

11), Implementation (4, 9, 11, 14, 15, 16, 17, 18 and 19) and Evaluation (6, 7, 8, 11, 12, 13 and 14).



Source: Kiebalo et al. (2020)

Figure 2: Nutritional Screening Flow on PD Patient

The above figure of Nutritional Screening Flowchart demonstrates clear flow on how to screen CAPD patient from the start which is the measurement of Weigh and BMI, checked if there is Protein Energy

Wasting (PEW), followed by Subjective Global Assessment (SGA), then to be identified of PEW if any and the last stage is to continue with the Therapy.

DISCUSSION

From the 17 reviewed records as results of the research above, there are 3 underlined problems need to be discussed. First, 5 records (29.41%) mention the roles of CAPD nurses, but there is no record that explicitly states Nutritional Screening as part of nurses' roles and responsibilities, both as a general nurse or as a specialist CAPD nurse. Second, 14 records (82.35%) mention the importance of Nutritional Assessment, but no record available on the standard formulation related to nutritional screening at an early stage, even though it is very important to determine the nutritional status of CKD patients prior to the PD procedure. Third, 9 records (52.94%) are about Nutritional Screening methods, yet there is no research that clearly documents the nutritional screening at the initial health assessment done by CAPD nurses.

CAPD Nurses' Roles

CAPD Nurses do not have specific role in initial nutritional screening explicitly mention in the 17 reviewed records of this study. Nutrition is separate branch of knowledge with its own professionalism. Yet, to some extent many healthcare professions include nutrition in their subjects of knowledge, such as medical and nursing professions. Nutrition is very important because it involves human needs (Ullu et al., 2018). Therefore to handle the nutritional-related problems require multi-

dimension approach. For example the increasing prevalence of malnutrition and overweight in eastern Indonesia, it raises the suspicion that limited access to food, both in terms of market access and economic access, has an effect on the double burden of malnutrition (Fauziyah, 2017). Both nutritional deficiencies and excess body weight can lead to an increased risk of non-communicable diseases and the risk of death (Willett, Dietz & Colditz, 1999). In Indonesia, most deaths in the age group over 45 years are caused by non-communicable diseases, where nearly 60 percent of deaths over 65 years are also caused by stroke, hypertension and heart disease, including CKD (Kemenkes RI, 2019). Related to CKD cases, nurses should be able to immediately take appropriate steps to anticipate this in their role as a CAPD nursing professional at the early stage (Afzal & Hardy, 2021). CAPD nurses have broad role with an emphasis on improving health and preventing disease, as well as looking at the client in a comprehensive manner (BPPSDM, 2018). They perform functions in relation to a variety of roles. Doheny et al. (1997) identified several elements of the role of professional nurses, including: 1. Care Giver (nursing care providers who provide nursing services directly and indirectly to clients, using the nursing process including: assessment, diagnosis, planning, implementation, and evaluation). 2. Client Advocate. 3.

Counselor. 4. Educator. 5. Collaborators. 6. Coordinator. 7. Change Agent, and as consultant. Law No.38, 2014 states, in carrying out their duties as health care providers in the field of public health, nurses are authorized to: a. Conduct community health nursing assessments at the family and community group levels. b. Determine public health nursing problems. c. Helping disease case finding d. Planning public health nursing actions. e. Carry out public health nursing actions. f. Carry out case referrals. g. Evaluating the results of public health nursing actions. h. Doing community empowerment. i. Carry out advocacy in public health care. j. Forge partnerships in public health care. k. Conducting health education and counseling. l. Manage cases, and m. Perform complementary and alternative nursing management (Kemenkes, 2019). The role of the CAPD nurse comprises four aspects, namely as a practitioner or implementer of nursing care, nursing service managers, researchers and educator (Yetti, 2007). In our studies description, nurses as front-liners for health workers, carry out comprehensive assessments in health care services. The health assessment from the nursing perspective include administrative questionnaire, medical information, anthropometric, basic clinical examination and other additional examination such as eye testing and electrocardiogram (BPPSDM, 2018). Therefore it is very important to embrace aspects of nutritional assessment in the list of Health Assessment from the nursing perspectives. Furthermore, nurses will collaborate with nutritionists and also report their findings if any disorders, to the nephrologist who will carry out the PD procedures (Saleh et al., 2018). This initial nutritional screening is very important in

the continuity of the CAPD procedure, as it will determine the patient's health status as early as possible.

Nutritional Screening Flow in Health Assessment by CAPD Nurses

This study shows 9 records which mention Nutritional Screening. However no record mentions where CAPD nurses play specific role with specific tasks during the nutritional screening process. In the USA, one of the standard of nutritional screening tools in treated patients using the Subjective Global Assessment (SGA) (ASPEN, 2021). Similarly Canadian Malnutrition Task Force recommends (Bauer et al., 2011). Another measuring nutritional tool to evaluate the patient's nutrition status is Malnutrition Screening Tools (MST) (Wi & Kim, 2017). MST represents a nutritional status assessment tool that has been implemented by the General Intensive Care Unit (ICU) of RSUD Achmad Mochtar Bukittinggi of West Sumatera (Ashra & Rina, 2017). American Society of Parenterals and Enteral (ASPEN) recommends it an assessment nutritional status or nutritional screening tools in patients who are treated using Subjective Global Assessment (SGA) (Shirodkar & Mohandas, 2005). The Council of Europe 2001, in Moriana et al., (2014) concluded that there was no standard assessment nutrition that can be used for all patients being treated. The nutritional assessment must be initial, simple, based on the latest science and can be adapted to clinical nursing environment. MST is a measuring tool for assessment of nutritional status with simple format and fast (Ashra & Rina, 2017). The assessment is carried out at the beginning the patient is admitted to the hospital. This tool has been

tested its validity and reliability especially for patients at acute care areas that need assessment nutritional status (Susetyowati et al., 2014). Nutritional screening is an essential first step in the structured process of nutrition care to identify patients that will likely give advantages from nutritional therapy (Sorensen et al., 2008). MST questions aims to assess weight loss and recent changes in food intake (Reber et al., 2019). Then the value will be summed and classified, if the value > 2 then the patient is said to be a risk of malnutrition. If the patient's MST value is > 2 , then the nurse will report the nutritional status of this patient to the nutrition team to do more assessments (Ashra & Rina, 2017). Another simple method of screening is as recommended by Keibalo et al. (2020) who also used a Subjective Global Assessment (SGA) for patients with suspected Protein Energy Wasting (PEW). Subjective Global Assessment (SGA) evaluates whether an individual is appropriately nourished i.e. whether nutrient intake and absorption meet the nutrient requirements of an individual (Wi & Kim, 2017). When there is an imbalance among nutrient intake, absorption and requirement then malnutrition occurs. The primary purpose of SGA is to determine whether nutrition deficit plays a role in a patient's condition and therefore, whether nutritional treatment is required. SGA uses a focused history and physical examination to classify individuals into well nourished, mildly/moderately malnourished and severely malnourished categories (Ashra & Rina, 2017). The objective is to identify patients who would benefit from nutritional therapy (Bauer et al., 2011). Hasan Sadikin Hospital of Bandung (Meilyana et al., 2010) and Dr. Wahidin Sudirohusodo of Makassar Hospital

(Darise, 2016) have been implementing this nutritional screening system. In short, SGA is very popular and it is time in Indonesia to include this nutritional screening like SGA as part of the CAPD nurses' competency in the list of initial assessment process of CAPD patients. This formula is not yet included in the competency list of CAPD nurses (IPDI, 2017). This step needs to be formulated within the standardized format. Moreover, the material related to the nutrition of CAPD patients CAPD Training for Nurses designed by BPPSDM (2018).

The Impact of Nutritional Screening by CAPD Nurses

The results of this study indicate an imbalance between the role of CAPD nurses and the nutritional status of CAPD patients. This is evident from the 21 existing records; there is not a single record which documents the involvement of CAPD nurses in the initial nutritional screening. The first impact of nutritional screening is adding to the workload of CAPD nurses where it has not been listed in the list of CAPD Nurses competencies. If patient engagement is considered to be crucial for the effective and positive outcome, then it is critical to explore and investigate the patient engagement activities with health care professionals of CAPD therapy including with nurses, nutritionist, nephrologist and other healthcare workers (Darmayanti et al., 2019). In fact, nurses are the first health care professionals to see CAPD patients. The number of certified CAPD nurses in Indonesia is 7,420 nurses and 140 nephrologists (IRR, 2018). Even then, there is still a shortage of 7681 nurses to serve 132,142 active patients. No data has

been obtained yet on the number of nutritionists in the hospital with 82 CAPD services across Indonesia (IRR, 2018). At least one third of hospitalized patients being admitted malnourished, dietitian in many institutions lack adequate, nutrition care is often delayed (Chompoosaeng, 2013). In the future, this phenomenon is risky because the delay in assessment will affect the handling of patients, especially if they are in a malnourished condition (Reber et al., 2019). Nurses provide and oversee patient, yet they are rarely included in nutrition care (Chompoosaeng, 2013). According to WHO, nurses occupy 59% of all health professionals (World Health Organization, 2017). Malnutrition is quite common and nutritional intake plays an important role in mortality in CAPD patients (Sharif, 2012). Independent of dialysis efficacy and prevention or treatment of malnutrition by suitable means is necessary to improve clinical outcomes in CAPD patients (Young et al., 1991). These findings demonstrate that the involvement of CAPD nurses in Nutritional Screening offer advantages clinically to CAPD patients and professionally to other healthcare professions.

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CONCLUSION

One of the high risks faced by CKD patients with CAPD is a decreased nutritional condition which is prone to complications. The shortening of initial nutritional screening has been shown by these studies to be of clinical benefit for the patient. CAPD nurses are suggested to carry out nutritional screening at this early stage with a simple, inexpensive and practical method, namely the Subjective Global Assessment (SGA) which has proven to be widely recommended by researchers. This study tried to analyze 103 records and reviewed 17 studies (16.50%) which were included in the PRISMA Analysis. Out of 17 studies, 9 records fell under the study characters of nutritional screening method. This study recommends the use of SGA as a simple screening method to be included as part of the CAPD nurses competency list. It is considered as the most appropriate and practical way of nutritional screening for the patients. It has been proven clinically very useful. However, from the nursing perspectives, future research is still highly recommended.

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