Original Research

Indonesian Journal of Health Administration
(Jurnal Administrasi Kesehatan Indonesia)
p-ISSN 2303-3592, e-ISSN 2540-9301
10.20473/jaki.v10i1.2022.50-59

THE EFFECT OF SERVICE QUALITY DIMENSIONS ON HEMODIALYSIS PATIENT SATISFACTION IN INDONESIA

Pengaruh Dimensi Kualitas Pelayanan Terhadap Kepuasan Pasien Hemodialisis di Indonesia

***Lia Kurnia Hartanti[1], Ferdi Antonio[1]**
[1]Hospital Administration, Graduate School, Pelita Harapan University, Indonesia
Correspondence*:
Address: Gedung UPH EEC, 1st Floor Jl. Garnisun Dalam, Jakarta, Indonesia | e-mail: liakurniahartanti@gmail.com

Abstract

Background: Chronic kidney disease is a catastrophic disease ranked second in Indonesia for high health costs. The number of renal units in Indonesia has rapidly increased since the launch of the National Health Insurance program in 2014. Its increase was accompanied by the increased number of patients.
Aim: This study analyzed the effect of service quality dimensions on patient satisfaction with hemodialysis care.
Methods: This study used a cross-sectional design and a quantitative method. It retrieved data from respondents who had undergone hemodialysis care at hospitals and clinics in Jakarta and surroundings. The PLS-SEM approach was used to analyze the data.
Results: Eight service dimensions were proven to influence the overall service quality and directly impact patient satisfaction. The influential dimensions included facilities and organization of the service, care by attending nurses and assistants, attention to psychological and administrative issues, medical attention and care, nutrition attention and care, medication supply and quality, features and administration process, attention and care given by the head nurse. All of these dimensions affected patient satisfaction as a dependent variable. This study has strong predictive accuracy, and thus it can be replicable in future research with different populations.
Conclusion: This study demonstrated eight service quality dimensions that affect service quality and directly impact satisfaction of hemodialysis patients both with hospital and clinic services.

Keywords: hemodialysis, patient satisfaction, service quality

Abstrak

Latar Belakang: *Penyakit ginjal kronis termasuk penyakit katastropik yang membutuhkan biaya penanganan yang tinggi di Indonesia. Jumlah* renal unit *di Indonesia berkembang pesat sejak diluncurkannya program Jaminan Kesehatan Nasional (JKN) tahun 2014. Peningkatan tersebut diiringi peningkatan jumlah pasien*
Tujuan: *Penelitian ini menganalisis pengaruh dimensi kualitas layanan dan kepuasan pasien dengan pelayanan hemodialisis.*
Metode: *Penelitian ini menggunakan desain potong lintang dan metode kuantitatif. Data dikumpulkan dari responden yang menjalani perawatan hemodialisis di rumah sakit dan klinik di Jakarta dan sekitarnya. Pendekatan PLS-SEM digunakan untuk menganalisis data.*
Hasil: *Terdapat delapan dimensi pelayanan yang terbukti membentuk kualitas pelayanan secara keseluruhan dan berdampak langsung terhadap kepuasan pasien. Dimensi tersebut meliputi fasilitas dan organisasi layanan, perawatan yang diberikan oleh perawat, perhatian masalah psikologis dan administrasi, perhatian dan pelayanan medis, perhatian dan perawatan nutrisi, pasokan dan kualitas obat, fitur dan proses administrasi, perhatian dan perawatan yang diberikan oleh kepala perawat. Seluruh dimensi tersebut berpengaruh terhadap kepuasan pasien sebagai variabel terikat. Penelitian ini memiliki akurasi prediksi yang kuat, sehingga dapat direplikasi pada penelitian selanjutnya dengan populasi yang berbeda.*
Kesimpulan: *Penelitian ini menunjukkan delapan dimensi pelayanan yang membentuk kualitas pelayanan dan berdampak langsung terhadap kepuasan pasien pelayanan hemodialisis.*

Kata kunci*: hemodialisis,* kepuasan pasien, kualitas pelayanan

Indonesian Journal of Health Administration (*Jurnal Administrasi Kesehatan Indonesia*)
p-ISSN 2303-3592, e-ISSN 2540-9301
Volume 10 No.1 2022 DOI: 10.20473/jaki.v10i1.2022.50-59
Received: (2021-07-23), Revised: (2022-01-07), Accepted: (2022-01-25), Published: (2022-06-30)
Published by Universitas Airlangga in collaboration with Perhimpunan Sarjana dan Profesional Kesehatan Masyarakat Indonesia (Persakmi).

Indonesian Journal of Health Administration
(Jurnal Administrasi Kesehatan Indonesia)
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Introduction

Chronic kidney disease (CKD) is a disease because of damage to the kidney's structure or function that lasts more than three months with a glomerular filtration rate (GFR) of less than 60 mL/min/1.73m2 (KDIGO, 2012).

Chronic kidney disease and dialysis are not only medical problems but also economic problems. A renal replacement therapy requires a lot of resources because the equipment and materials are quite expensive (Peeters *et al.*, 2000). The Social Security Agency for Health (BPJS Kesehatan) released data from 2014 to 2016 mentioning chronic kidney disease was in the second position after heart disease which spent 1.6 trillion of BPJS funds in 2014.

According to the ninth report of the Indonesian Renal Registry (IRR) (2016), the most common cause of CKD was diabetic nephropathy at 52% (Pernefri, 2018). Karopadi (2013) revealed that there are about 1.75 million patients worldwide who routinely undergo dialysis, of whom was about 1.55 (89%) million undergoing hemodialysis (Karopadi *et al.*, 2013).

The number of the renal units in Indonesia has grown very rapidly since the launch of the National Health Insurance (NHI) or *Jaminan Kesehatan Nasional* (JKN) program in 2014. It goes along with the increased number of patients because, with this NHI program, all Indonesians have access to chronic dialysis and one of the therapies (Pernefri, 2018). Renal units are mostly owned by private hospitals compared to public hospitals (Pernefri, 2018).

In Indonesia, hospital accreditation is mandatory for all standards of healthcare facilities and human resources who need to be competent and certified. Most of the standards have not completely been fulfilled. The lack of dialysis training centers in turn minimizes learning opportunities for staff (Karopadi *et al.*, 2013). The ratio of the number of machines and nurses is assumed to affect the quality of service in the hemodialysis unit.

Medical service managers may achieve effective operational performance if they understand techniques for improving service quality and the cause-and-effect relationship between service quality indicators, quality structure, customer satisfaction, and measurement of sustainable service quality (Raadabadi *et al.*, 2017).

Satisfaction with health services is defined as patient's perception of service quality, and it becomes an indicator of the healthcare organization' performance (Nguyen Thi *et al.*, 2008). Patient satisfaction is also associated with adherence to therapy. Increased satisfaction may lead to increased adherence (Wasserfallen *et al.*, 2004). In dialysis patients, previous studies have shown that satisfaction can make patients more likely to comply with medical rules (Rundle *et al.*, 2004), for example, dietary restrictions, while non-adherence likely can reduce life expectancy (McGee *et al.*, 1998).

Palmer *et al.* (2014) conducted a study on patient satisfaction at hemodialysis service centers using data from Diaverum. He discovered most of the respondents considered that the overall dialysis treatment was very good but still had to be improved. From this study, few patients recommended the hemodialysis treatment to others as they did not understand the suggestions and improvements of the hemodialysis centers (Palmer *et al.*, 2014).

Besides, few validated instruments are available to evaluate satisfaction among renal disease patients undergoing a dialysis therapy. The Choice for Healthy Outcomes in Caring for End-Stage Renal Disease (CHOICE) is an instrument used to compare satisfaction with types of dialysis therapy (Rubin *et al.*, 1997). Other instruments for evaluating satisfaction of patients undergoing dialysis are Satisfaction of Patients in Chronic Dialysis (SEQUS) (Wasserfallen *et al.*, 2004) and SDIALOR (Satisfaction des patient dialysés en Lorraine) (Nguyen Thi *et al.*, 2008). Various factors affecting service quality and patient satisfaction have been analyzed. Some studies on patient satisfaction with dialysis services have been done in many countries across

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multiple dimensions, including the physical environment, aspects of interpersonal care, and psychosocial support (Kovac *et al.*, 2002). From several questionnaires and research conducted on satisfaction of patients receiving a dialysis therapy, this current study adopted the ESUR-HD (Service Satisfaction Evaluation) questionnaire from the study of Sanabria-Arenas *et al.* (2017).

The topic about service quality and customer satisfaction is not new. These two causal sequences in different industries have been given considerable attention since the last 30 years. (Crosby and Stephens, 1987). Service quality depends on the level of significant service dimensions. The SERVQUAL, a service quality measurement, involves five dimensions, namely assurance, reliability, tangibility, empathy, and responsiveness (Berry, Parasuraman and Zeithaml, 1988). It is then widely applied to research in the field of health, including hospital services (Babakus and Mangold, 1992).

Donabedian (1988) explained the theory of healthcare quality related to patient satisfaction as an important outcome of the interpersonal health service process (Donabedian, 1988). Another theory explicates the quality of health care is an increasingly key issue in medicine (Bodenheimer, 1999) and related to chronic conditions, such as cases of end-stage renal disease. Regarding kidney disease, quality improvement is necessary not only in dialysis therapy but also products and services (Kirchgessner *et al.*, 2006).

According to Parasuraman (1988), the notion of consumer satisfaction is concerned about how far the difference (gap) between expectations and perceived performance is. There are two important aspects, in this case, which are expectations of receiving services (beliefs) and perceptions after receiving the services (perception) (Berry, Parasuraman and Zeithaml, 1988). Patient satisfaction with chronic kidney care and services, it has been said, is also related to the quality of life as perceived by the patient (Wasserfallen *et al.*, 2004). Another remarkable aspect of the hemodialysis service is its specific procedure and long-term nature of the therapy. Patients and caring teams usually develop a close and lasting relationship (Kimmel, 2005). Sanabria-Arenas *et al.* (2017) revealed that patient satisfaction is an indicator of the quality of health services. Satisfaction can be measured by using developed and validated instruments. The former research has validated the scale to measure satisfaction of hemodialysis patients using the Service Satisfaction Evaluation (ESUR-HD) (Sanabria-Arenas *et al.*, 2017). The research adopted the SERVQUAL model by Parasuraman (1988) five dimensions of SERVQUAL applied were developed to be nine dimensions. However, the current study did not select contact and social workers dimensions because there were very few patients visiting private hospitals and private hemodialysis clinics in Indonesia.

Method

This study focused on hemodialysis services at hospitals and clinics that had a minimum of five hemodialysis machines. The hospitals and clinics resided around the Jakarta area where hemodialysis patients generally had the middle to upper socioeconomic status with a good level of education. Given their background, it was assumed that as potential consumers, they could provide an overview of their expectations, and they were technology literate patients for surveys. The patients were considered to represent the general hemodialysis patients in Indonesia. This study also included several characteristics of respondents, such as their age, gender, occupation, length of hemodialysis treatment, and payment methods for service bills.

This study investigated the effects of independent variables (facilities and organization of the service, attention provided by nurse, attention to psychological and administrative issues, medical attention and care, attention to nutrition and care, medication supply and quality, features and administration process, attention and care given by the head nurse) on patient satisfaction as a

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dependent variable. The study adopted a research method from Sanabria-Arenas *et al*. (2017). Nine indicators were developed, but only eight indicators were chosen as the indicators could represent services at hemodialysis facilities in Indonesia. The other indicator, contact and social workers, was not chosen due to few patients attending private hospitals and private hemodialysis clinics in Indonesia. There were 44 items available to evaluate satisfaction with services received by patients with chronic kidney disease.

The respondents met some criteria: patients still undergoing hemodialysis treatment, currently undergoing other kidney replacement therapy (Continuous Peritoneal Ambulatory Dialysis and kidney transplantation), being at least 18 years old, and taking hemodialysis therapy at hospitals and clinics in Jakarta and surroundings.

This study was a cross-sectional, quantitative survey study whose research model was modified from the previous research. It added some measurable aspects that would affect the quality of service and then customer satisfaction. The questionnaires used in the previous research were adapted to current conditions of hemodialysis service in Indonesia.

This study used the Partial Least Square Structural Equation Modeling (PLS-SEM) analysis method. The minimum sample size was 160 respondents. This study finally included 321 respondents as the research samples were selected purposively. The respondents would receive an online questionnaire link.

In this research model, there were eight variables (formative and reflective variables) with nine paths as well as repeated indicators (service quality). Then, the effect between variables simultaneously was tested. Furthermore, from the various available multivariate analysis methods, the partial least squares-structural equation modeling (PLS-SEM) based on variance was selected.

The eight variables with nine paths were marked with arrows to describe the research hypothesis. The research model along with the hypothesis is presented in Figure 1.

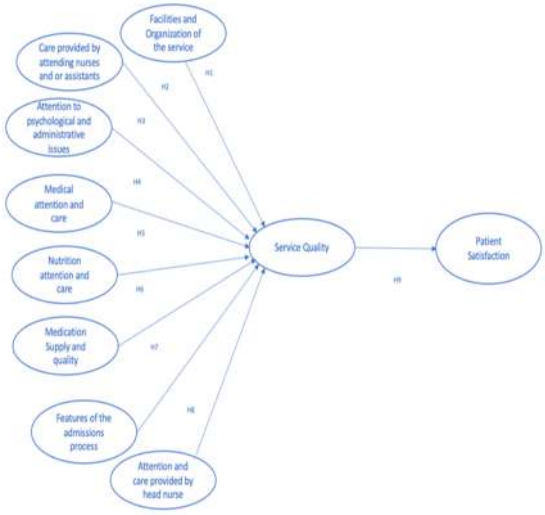

Figure 1. Conceptual Framework

Result and Discussion

Viewed from the respondents' characteristics, the majority of the respondents were aged between 41-50 years old, which is the productive age. They mostly work as housewives and mostly use social media or online social networks to communicate and express their feelings or share their experiences. About 7.5% of the respondents were retirees who probably did not understand technology-based questionnaires. Almost all of the respondents financed their hemodialysis treatment with BPJS Kesehatan (91%). Two fifth of the respondents had undergone dialysis treatment at private hospitals, which likely have developed HD units. Private hospitals also have a strategic role in the government's health development program, and thus their consumers are also considered potential. With the competitive business environment, the respondents as the consumers mostly had the upper-middle socioeconomic status with a good level of education. Therefore, they could provide an overview of the expectations of the hospital's hemodialysis services.

Out of 321 respondents, 82% had undergone hemodialysis treatment for more than 1 year, and only 0.9% for less

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than 1 month ago. With such situations, the data gathered on the quality of hemodialysis treatment and patient satisfaction were quite representative.

From the output of the outer model, there were 42 indicators out of 44 reflective indicators used in the survey. The indicators used were the FOH2 and FOH3 indicators from the variable of facility and organization of the services to meet the reliability and validity of the model. From the outer model, all 42 indicators were reliable to measure the quality of hemodialysis and patient satisfaction according to the required outer loading value (Hair *et al.*, 2014).

The four parameters of the reliability and validity test on the outer model include reliability indicator (outer loading), construct reliability (Cronbach's alpha and composite reliability), construct validity (average variance extracted or AVE), and discriminant validity (Fornell-Larcker Criterion). All indicators were reliable and valid to measure the respective constructs; thus, the inner model test (structural model) could be used afterwards.

The image of the inner model shows the T-statistic values of the 9 paths in the research model. All of the paths whose T-statistic values are above the t-table were significant. From the structural model analysis on the values of R2 and Q2, this research model was in a moderate to a strong category on the dependent variable on the service quality variable. It had a strong predictive accuracy on the effect of service quality variable on patient satisfaction variable.

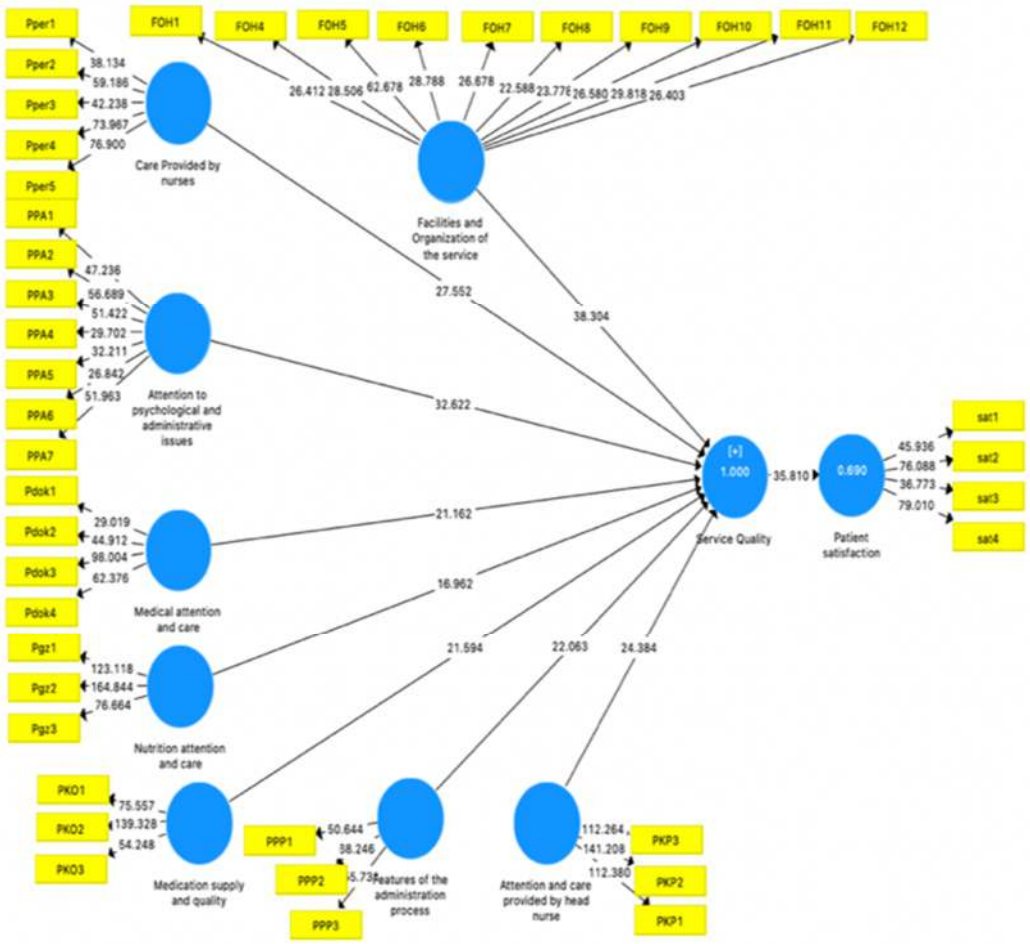

Figure 2. Inner Research Model Results

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Table 1. Respondents' Characteristics

Descriptions	Category	Count	Percentage
Age	< 20 years old	2	0.6 %
	21-30 years old	27	8.4 %
	31-40 years old	74	23.1 %
	41-50 years old	61	34.4 %
	51-60 years old	111	19.1 %
	> 60 years old	46	14.4 %
Total		321	100 %
Gender	Male	183	56.9 %
	Female	138	43.1 %
Total		321	100 %
Occupation	Professional	3	0.9 %
	Private employee	50	15.3 %
	Public employee	21	6.6%
	Entrepreneur	35	10.9%
	Housewife	100	31.3 %
	Retirement	24	7.5 %
	Others	88	27.5 %
Total		321	100 %
Payment	BPJS	290	91 %
	Private	14	4 %
	Insurance	3	1 %
	Company	14	4%
Total		321	100 %
Length of Hemodialysis	> 1 years	263	82 %
	6-12 months	32	10 %
	3-6 months	13	4 %
	1-3 months	9	3%
	< 1 month	4	1 %
Total		321	100 %
Dialysis Unit	Private hospitals	240	75%
	Public hospitals	59	18.1%
	Clinics	22	6.9 %
Total		321	100 %

Table 2. Important Performance Map Analysis (IPMA) Facilities and Organization of Services

Facilities and Organization of The Service	IPMA Total Effect of Service Quality Indicator	IPMA Performance of Service Quality Indicators
FOH 1	0.0244	84.5794
FOH 10	0.0257	85.7477
FO H11	0.0268	85.5140
FO H12	0.0281	88.7072
FO H4	0.0336	90.1869
FO H5	0.0307	88.7850
FO H6	0.0246	82.9439
FO H7	0.0258	86.4486
FO H8	0.0251	84.8131
FO H9	0.0263	84.7352

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p-ISSN 2303-3592, e-ISSN 2540-9301
10.20473/jaki.v10i1.2022.50-59

This study also had a large predictive relevance, and thus this research model could also be replicated with different populations. The independent variables in this model had a significant effect. Facilities and organization of the service had the strongest effect on service quality, followed by attention to psychological and administrative issues. The next variable that had a considerable influence on service quality was care given by nurses or assistants. The Importance Performance Map Analysis (IPMA) showed tangible and empathy variables, represented by facilities and organization of the service and attention to psychological and administrative issues, had good results. The patients also considered the variables important.

From the facilities and organization of the service variable, FOH4 on the total effect and performance indicator had the highest value (see at Table 2). It indicated hemodialysis patients' rights need to be respected, and this has also been carried out well in the HD facilities studied.

However, all of the indicators had a positive effect on the quality of hemodialysis services despite being considered important by the patient

The number of renal units in Indonesia has grown very rapidly since the launch of the National Health Insurance (NHI) program in 2014. At the same time, the number of patients increasingly have access to chronic dialysis therapies covered by this program (Pernefri, 2018).

Previous studies have shown that satisfied patients are more likely to comply with medical rules (Rundle *et al.*, 2004). Some studies around the world have been conducted on various variables of patient satisfaction with dialysis services, including the physical environment, aspects of interpersonal care, and psychosocial support (Kovac *et al.*, 2002). The gray relational analysis (GRA) method could analyze the service quality and patient satisfaction besides evaluating the quality of services (Rundle *et al.*, 2004) at dialysis centers (Aydemir and Sahin, 2019).

The results of the PLS-SEM analysis showed an empirical research model. In this model, the nine paths, all of them are significantly proven with a positive effect following the direction of the hypothesis so that all hypotheses can be supported.

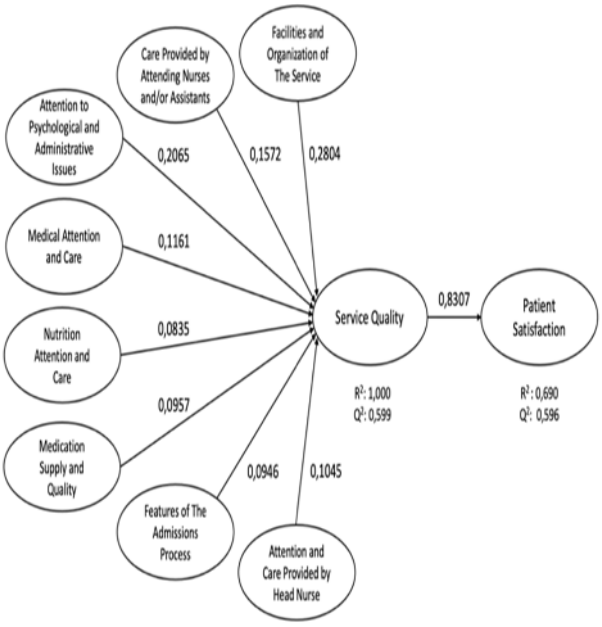

Figure 3. Empirical Model

The strongest effect was resulted from facilities and organization of services on service quality, followed by attention to psychological and administrative issues. Donnabedian (1988) stated that interpersonal quality refers to the extent to which the needs and preferences of patients are accommodated. Facilities include features such as the comfort of the physical environment and the attributes of the service. Previous research has also defined that satisfaction with health facilities is the quality of service perceived by patients and becomes an indicator of organizational performance (Nguyen Thi *et al.*, 2008).

Facilities and organization of services are also a reflection of tangibility. The FOH4 indicator showed that patients' expectations of being respected. Therefore, hospital managers and hemodialysis unit developers need to prioritize budget and resources e.g., facilities and management for improving the service quality. The Indonesian Nephrology Association (IASN) and the Indonesian Ministry of Health advise health facilities to properly manage the structure

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and functions of each profession, employ adequate numbers of skilled nurses, as well as create a comfortable and safe environment as a patient's second home. Staff must behave friendly to patients; hence, the patients feel appreciated. Communication with human resource staff can also be of management concerns. Despite facilities and management, attention to psychological and administrative issues could be a reflection of the empathy variable. This variable could determine patients' expectations of warm and friendly care from the staff.

Service quality may impact patient satisfaction with a coefficient of 0.8307 which was the greatest value of all paths and thus had a significant impact. Previous research by Bodenheimer (1999) mentioned the quality of healthcare is influential on treatment, especially chronic disease treatment, for example, end-stage kidney disease (Bodenheimer, 1999).

Patient satisfaction with chronic kidney care and services is also related to the perceived quality of life (Wasserfallen *et al.*, 2004). It confirms that service quality has a positive effect on patient satisfaction. This study is in line with research by Babakus and Mangold (1992), who used the SERVQUAL for assessing the magnitude of patient perceptions and expectations (Babakus and Mangold, 1992).

When compared with previous studies, Sanabria-Arenas *et al.* (2017) concluded that the significant variables were facilities and organization of the service, social workers, and medical attention and care. Similarly, the strongest influential variable in this study was the variable facilities and organization of services, and, the indicator with FOH4 had the largest value is FOH4, which is where patients feel that their rights as patients are respected. This also shows that the tangibility represented by the facilities and organization of the service variable is important for HD patients. And Tangibility i.e., facilities and management can be input for the hospital management to improve hemodialysis services. From the specific indirect effect, the facilities and organization of the service variables had the strongest influence on patient satisfaction through service quality. Attention to psychological and administrative issues had a big influence on the facilities and organization of the services, this variable has a considerable influence, and shows that the empathy variable it represents is important and expected for HD service satisfaction. The last important variable was empathy.

Conclusion

The PLS-SEM analysis showed that the research model of hemodialysis services significantly proved the nine paths and all hypotheses. The structural model analysis showed that this research model presented a moderate to a strong effect of the dependent variable on service quality. It also showed a strong predictive accuracy on service quality that impacted patient satisfaction. With a large predictive relevance, this research model is replicable in different populations. The strongest influential variable was facilities and organization of services, followed by attention to psychological and administrative issues. This study can prove that eight dimensions had a positive effect on service quality and patient satisfaction with hemodialysis services both at hospitals and clinics.

This study has some limitations. First, the online questionnaire might be biased for whether the respondents just started hemodialysis treatment or had undergone the hemodialysis treatment. With many indicators studied, it might put the respondents in boredom when filling out the questionnaire. Another bias is about factors that influence some types of treatment payment. Therefore, future researchers need to address this financing aspect based on hospital classes.

Abbreviations

CKD: Chronic Kidney Disease, GFR: Glomerular Filtration Rate, BPJS: Social Security Agency for Health, NHI: National Health Insurance, CHOICE: Choice for Healthy Outcomes in Caring for End-Stage Renal Disease, PLS-SEM: Partial Least

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Square Structural Equation Modeling, SERVQUAL: Service Quality.

Declarations

Ethics Approval and Participation Consent

The respondents were given the survey's objectives and purposes. Before participating, they confirmed their participation verbally.

Conflict of Interest

There is no conflict of interest in this study.

Availability of Data and Materials

Data and material can be obtained upon request.

Authors' Contribution

LKH and FA conceptualized this study; FA developed the methodology; LKH wrote the original draft.

Acknowledgment

We would like to thank the Faculty of Public Health, Pelita Harapan University, for giving support, not to mention all the contributors who helped the research.

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(Jurnal Administrasi Kesehatan Indonesia)
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