

Hemodialysis Patients and Nurses' Perspective: What Is a Qualified Nursing Care?

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Abstract

Background: With the high prevalence of chronic diseases such as chronic kidney disease (CKD) and consequently, the increasing number of hemodialysis (HD) patients, providing high-quality care has become a health concern in many countries. Therefore, the present study aimed to explore the concept of "qualified care" from HD patients' and nurses' points of view.

Methods: This qualitative study was conducted using a content analysis approach. A total of 48 patients and nurses in the HD wards were selected through purposive and snowball sampling methods. Sampling continued until data saturation. Finally, a total of 54 interviews were conducted with the participants. The interviews were recorded with the participants' permission and analyzed using Graneheim and Lundman approach.

Results: In this study, 16.7% of the nurses were male, and their mean age was 35.4 ± 7.47 years. Moreover, 50% of the HD patients were male, and their mean age was 53.1 ± 8.6 years. The results of the analysis of the interviews in response to the main question were classified into four main themes including (a) physical care, (b) psychological care, (c) ethical care, and (d) extensive skills and knowledge of the nurse.

Conclusion: From the patients' and nurses' perspective, empathy and companionship in sessions, fulfilling daily needs, social support, and high-quality dialysis are the components of the concept of care. Therefore, these concepts should be considered in the care programs for HD patients designed by the healthcare team.

Keywords: Chronic kidney disease, Hemodialysis, Nursing care

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Introduction

The increase in life expectancy has made chronic diseases a major problem for health care systems. One such disease, which is addressed as one of the most common health problems in the world, is chronic kidney disease (CKD) (1,2). CKD is defined as the failure in kidney function that leads to the accumulation of toxins in the body, water and electrolyte retention, as well as acid and base, endocrine, and metabolic disorders (3-6). In the United States alone, 300,000 people suffer from this disease. In Iran, according to the available statistics, 1,200-1,600 individuals are annually added to the number of patients with CKD (7).

The renal replacement therapies for CKD patients include hemodialysis (HD), peritoneal dialysis, and renal transplantation. The shortage of kidneys for transplantation, lack of information, and cultural issues regarding peritoneal dialysis have made HD the most

common method used for patients (8). Although HD improves the symptoms and increases the patients' survival rate, it does not change the course of the disease, and the kidney function is not completely replaced with it (9). The main goal of HD is to manage uremia, fluid retention, and electrolyte imbalance which result from CKD (10).

HD is not considered as a treatment for CKD, but simply as an alternative option for kidney function (9). The results of previous studies showed that multiple physical and psychological consequences caused by HD lead to several disturbances in various dimensions of patients' health-related quality of life (11,12).

During HD, nurses are responsible for direct patient care and spend more time with the patients than the other health care workers (13). In fact, they are responsible for diagnosing and responding to the needs and caring



challenges of HD patients in the hospital and at home (14). As most of these patients show poor quality of life and spend a significant part of their life in the hospital, if low-quality services are provided for them, they will be confronted with several complications such as various infections, exacerbation of some complications secondary to HD, and development of some common psychological disorders like anxiety and depression (11,12). In this case, paying special attention to the patients' needs and providing appropriate and high-quality care to support them are necessary (5).

The main goal of nursing care is to meet the patient's needs. Patient-centered nursing care that includes all the activities of the nurses in time of caring for patients, solves the patients' problems and contributes to their physical, mental, social, economic, and spiritual improvement (15).

The results of the studies by Nguyen et al and Wang et al revealed that preventive nursing interventions during and after HD help the patients be more compatible with the process and have a safe HD without any problems and complications. The complications that occur during and after HD are sometimes life-threatening. Thus, timely diagnosis and nurses' correct and prompt interventions can reduce the risk of the complications and their severity (16,17). The results of previous studies showed that nursing care services require major reform so as to make the nurses feel more responsible for caring for the patients, be skilled and accountable in providing the safest and high-quality services, and play a key role in continuing care (15).

Improving nursing practices and providing high-quality care during HD require understanding the concept of "qualified care" from HD patients' and nurses' perspective. Therefore, the present study aimed to explore this concept from the point of view of patients and nurses in the HD ward.

Methods

This study is part of a larger research entitled "Designing and evaluating the psychometric properties of nursing care auditing instrument: before, during and after hemodialysis". In order to clarify different aspects of the topic and gain a deeper and more comprehensive understanding, the content analysis approach was used. A total of 48 patients and nurses in the HD wards (18 nurses and 30 HD patients) participated in this study.

Data were collected through in-depth and semi-structured interviews conducted in the HD wards of hospitals affiliated with the Qazvin University of Medical Sciences. Sampling was done using purposive and snowball sampling methods. For HD patients, the inclusion criteria were being under HD treatment for at least 6 months and at least twice a week and being willing to participate in the study. For nurses, the inclusion criteria were having a work experience of at least 6

months in the HD wards and being willing to participate in the study. For both groups, the exclusion criteria were suffering from a mental disease, having a history of suicide, taking psychotropic drugs, having an acute physical disease, and having experienced severe stressful events leading to a significant psychological imbalance within the past month.

The interviews were carried out in a calm and stress-free room in the HD ward. First, several questions were asked regarding the participants' demographic characteristics, and then, the interviews continued by asking the following open-ended question: "In your opinion, what is qualified care in HD?" Based on the participants' answers, follow-up questions were asked to further clarify the topic. One of the follow-up questions asked from the HD patients was, "Would you please explain the types of nursing care that you received during and after HD?" Another question was "Can you talk about the limitations and problems of HD that you experienced?" One of the follow-up questions asked from nurses was, "Would you please talk about your experiences in the HD ward?" Each interview lasted between 45 to 60 minutes. At the end of the interviews, the participants were asked to comment on any remaining issues, and after appreciating them, the possibility of holding subsequent interview sessions was discussed. Each interview was digitally recorded, written word-by-word, and immediately analyzed. Finally, the study was saturated with 56 interviews.

The collected data were analyzed using Graneheim and Lundman's 5-step content analysis approach (Table 1) (18-21).

To ensure data rigor, the member check was conducted. In addition, the texts of the interviews, the initial codes, and the extracted subcategories were reviewed and modified by four faculty members in critical care nursing department. Allocating enough time for data collection, implementing the texts of the interviews immediately after recording them, and simultaneously analyzing the data made the data credible. Finally, considering maximum diversity in the selected sample confirmed the validity of the data.

Results

A total of 48 participants (18 nurses and 30 patients)

Table 1. Graneheim and Lundman's 5-step content analysis approach

Graneheim and Lundman's steps	
1. Transcription	Implementing the interviews' texts
2. Meaning units	Reading the interviews to gain a general understanding
3. Abstraction	Determining the meaning units and initial codes
4. Sorting the codes	Classifying similar initial codes into more comprehensive and general categories
5. Theme formulation	Introducing the categories' main themes

participated in the present study. Three nurses were male and 15 were female. Their mean age was 35.4 ± 7.47 years. Moreover, 15 nurses had a bachelor's degree in nursing and 3 had a master's degree. Their mean work experience in total was 10.78 ± 5.99 years, and their mean work experience in the HD wards was 5.83 ± 5.03 years. Besides, 15 HD patients were male and the rest were female. Their mean age was 53.1 ± 18.6 years. In terms of educational level, 15 patients were under diploma, 10 had high school diploma, 2 had an associate degree, and 3 had a bachelor's degree. The mean duration of dialysis was 3.9 ± 2.4 years. The mean number of dialysis sessions per week was 2.9 ± 0.4 ranging from 2 to 4 times per week.

The results of the analysis of the interviews in response to the main question of the study were classified into four main themes and 12 subcategories. The main themes included (a) physical care, (b) psychological care, (c) ethical care, and (d) extensive skills and knowledge of the nurse.

Figure 1 shows the themes and the relevant subcategories.

Physical care

One of the main themes identified in this study was "physical care before, during, and after HD". From participants' perspective, physical care is highly significant and it is one of the main concerns of patients during HD. The participants believed that physical care should begin when the patient enters the ward and continue until he/she leaves. Almost all the participants mentioned the care for vascular access and considered the nurses' role highly significant.

"Without any doubt, the care for vascular access is the most important and essential care for HD patients. In addition, many complications caused by poor vascular access, if left undiagnosed and untreated, can debilitate the patient and even lead to his/her death" (Nurse 3).

"When HD begins, the patient is involved in the vascular access and the care for it, and the nurse can take good care of this access by his/her skills and through patient education. In fact, not only does the vascular access failure reduce the efficiency and usefulness of the therapy and the patients' quality of life, but also it increases the course of the disease, hospitalization, and mortality" (Nurse 7).

"Sadly, I once experienced fever and chills during dialysis because of Shaldon infection, and my life flashed before my eyes. I was in such a bad mood that is impossible to describe" (Patient 18).

The results revealed that HD patients persistently experience fear and anxiety due to the risk of complications, and this feeling exacerbates when the nurses are novice and skeptical about their abilities to prevent and manage these complications. For the participants, it was also important that the nurses could maintain their composure in critical situations, and perform and manage the correct and prompt interventions at the time of complications.

"It's true that most of our patients are in a good and stable condition at the beginning of the process, but it has happened many times that during HD, several problems occur for the patients that even lead to their death. So, we need to have a well-written and comprehensive patient care plan from the time the patient enters the ward until he/she leaves" (Nurse 10).

One of the issues mentioned by the participants was

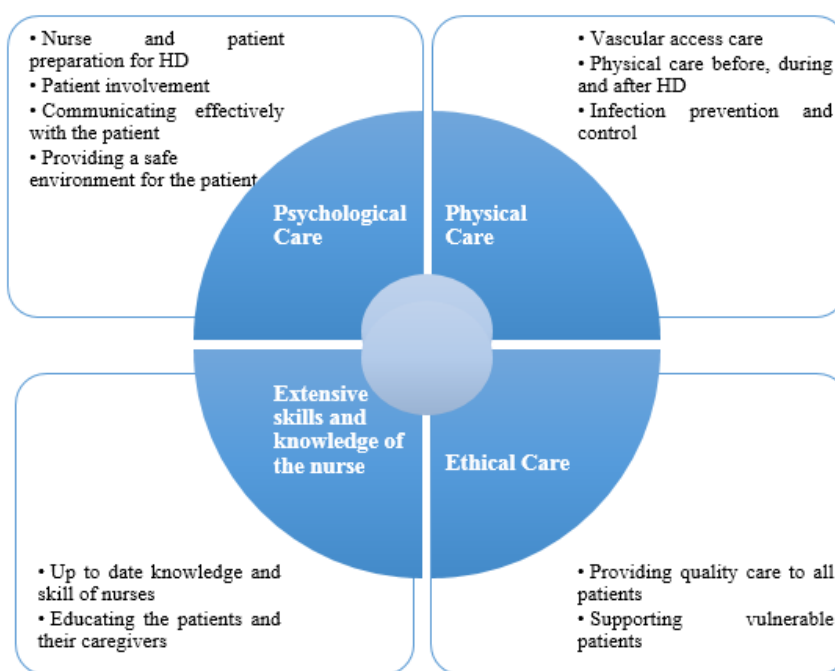


Figure 1. Themes and relevant subcategories

infection prevention and control. The patients considered themselves susceptible to a variety of infections due to a weakened immune system and reduced physical strength.

“Because of my condition, I can’t have a fistula or a graft, and all I can have is a Shaldon catheter. So, I have experienced Shaldon infection several times which is really horrible. I know I have to take care of myself, but nurses play an important role in this regard. Because of some structural problems in the ward, nurses sometimes just change their gloves” (Patient 8).

“I’m always afraid that I might get hepatitis, because there are several hepatitis patients undergoing HD in the wards” (Patient 9).

Psychological care

From participants’ perspective, patients and nurses should be mentally and emotionally prepared for dialysis. They pointed out that not every nurse is eligible to work in the HD wards at all.

“During the first sessions, patients experience and struggle with the most difficult challenges and they, without any exception, have to put up with some degrees of dependence on others. It can be expected that the patients struggle in order to maintain their independence. Sometimes, they go back to their childhood and show a state of denial by expressing their feelings against doctor’s instructions and nurses’ advice, not following the diet or not attending the treatment sessions” (Nurse 5).

Patient involvement was another significant subcategory of psychological care. The participants believed that the patients can be more committed to the program and have better mood and physical condition as well as higher mental health if they are involved in their care program.

“I try to encourage my patients to take care of themselves even in minor situations. I have a patient who is blind, but when I remove the fistula needles at the end of HD, I help him hold it to stop the bleeding. The feeling that she doesn’t need anyone in her care process makes her feel good” (Nurse 8).

The other significant subcategory of this theme was communicating effectively with the patient. Almost all participants put a special emphasis on how the nurse should communicate with the patient. They believed that observing such behaviors in nurse results in trust, and creates a sense of security and inner peace in patients.

“I never forget the first time I underwent HD. It was 2 o’clock in the morning when I entered the ward. It was dark and no one was there except a nurse who looked angry and upset. Later then, I realized that the nurse came from home for my dialysis. I saw that my blood was circulating in the machine, and asked with difficulty: ‘What is this?’ I heard the answer with anger: ‘What do you want me to tell you? You are on the dialysis’. That night passed with difficulty and I had bad and painful memories” (Patient 8).

Ethical care

Another main theme introduced by the participants was ethical care. Most participants believed that medical and nursing services should be provided without any discrimination.

“Since I’m blind and can’t see anything, I’m very dependent on my nurse during HD. When he/she calmly explains what he/she is doing for me before anything, I feel that he/she respects me and my physical defect doesn’t make him/her pay less attention to me” (Patient 24).

“The patient’s mismatch of thoughts, beliefs, and even religion has no effect on my performance. In my opinion, whoever he/she wants to be, he/she is a person who needs help, and I can help him/her. From God’s view, all human beings are equal” (Nurse 3).

Extensive skills and knowledge of the nurse

From participants’ perspective, nurses spend a lot of their time with the patients and therefore, they are the first to diagnose their problems within the early stages. This ensures that appropriate treatment can begin immediately and often prevent damage to the patient as long as the nurse has sufficient knowledge and skills.

“Before studying and knowing about the new methods of fixing the fistula needles, I always fixed the artery needle in the direction of the fistula and the vein needle in the opposite direction. But when I studied the new findings, I found out if they are fixed at the same direction, it makes AVF more viable and doesn’t conflict with the quality of the dialysis. From then on, I fix the needles at the same directions” (Nurse 15).

“Along with the advancement of dialysis machines and their capabilities (such as profiles and hemoperfusion), we update our knowledge so as to enhance dialysis efficacy” (Nurse 4).

“I undergo HD three times a week. When I undergo these complex machines, I experience a lot of stress. I don’t know anything about them and their buttons. My only hope after God is the nurses. They work very hard. When they are by my side, I feel calm and relaxed. But, when they aren’t around for a few minutes, I’m worried about the machine” (Patient 24).

Discussion

The present study showed that physical care should begin when the patient enters the ward and continue until the patient leaves. In other words, the patients need continuous care. This finding is in line with the results of the study by Silva et al. (22). In this regard, since currently the only way to perform HD is through vascular access (catheter and fistula), the subcategory of vascular access care is of great importance. This finding is in line with the results of the studies by Ashby et al, Dad et al, and Sola et al (23-25). According to the results of previous studies, a high percentage of hospitalizations of HD patients is due

to complications related to vascular access. Therefore, proper vascular access is the most fundamental way to reduce infection, length of hospital stay, and ultimately mortality in them (26).

Of the findings of the present study was the prevention and control of complications during and after HD. Similar to the present study, the results of the studies by Nguyen et al and Wang et al revealed that the preventive nursing interventions during and after HD help the patients be more compatible with the process and have a safe HD without any problems and complications (16,17). The complications that occur during and after HD are sometimes life-threatening. Accordingly, timely diagnosis and nurses' correct and prompt interventions can reduce the risk of the complications and their severity.

Considering the low level of immunity, presence of at least one underlying disease, performance of invasive procedures, frequent hospitalizations, and circulation of blood outside the body, the risk of transmitted diseases such as hepatitis and AIDS in these patients is more than others. Thus, infection control is highly important (27). Infection prevention and control was also another important finding of this study. In line with the present study, Ashby et al and Garthwaite et al emphasized the role of HD nurses regarding infection prevention and control (23,28). In addition, with the global prevalence of coronavirus disease (COVID-19), Lee et al pointed out the important role of HD nurses in infection control (29). There are various ways including vaccination, regular hand washing, environmental hygiene, proper disinfection of HD machines, and following the standard precautions which significantly help the HD nurses control and prevent infections.

One of the issues mentioned during the interviews was psychological care. The results of the present study revealed that in some psychological, social, and communication aspects such as allocating enough time to answer the patients' questions, spending more time with the patients when they feel lonely, and providing the necessary education regarding the diet and medication side effects, the quality of nursing care is poor. In line with the present study, Khaki et al reported that in some psychological and social aspects such as introducing new patients, explaining therapeutic and side effects of medications, informing the patients about the results of their tests and treatments, addressing the necessary sources and referral organizations to help in financial matters, predicting the patients' needs, understanding the worries of patients' families and providing the necessary education to reduce their anxiety, and allocating enough time to answer the patients' and their caregivers' questions, the quality of nursing care is poor (30). Furthermore, Wang et al and Nobahar et al also suggested that patient cooperation and involvement during HD facilitate nursing care and increase the patients' sense of security (17,31). Taking

everything into consideration, if HD nurses create a more humane and appropriate relationship with the patients, they will be able to perform their professional duties better, and the patients will adhere to the regimen therapy more. This ultimately accelerates the patient's adaptation to HD.

Another theme identified in this study was ethical care. The majority of the participants considered the observance of ethical principles as one of the most significant and decisive issues. In line with the present study, Mohammadi et al. investigated the ethical audit of nurses in critical care units and considered ethical care as one of the requirements of nursing (32). Moreover, in a study by Omidi et al, professional ethics was addressed as one of the nursing care requirements in HD wards which is in line with the results of the present study (33). Considering the long-term presence of the patients in the HD wards and their close and direct relationship with the nurses, it can be concluded that nurses who follow the principles of professional ethics provide high-quality nursing care.

The other finding of the present study was the extensive skills and knowledge of the nurse. This category was subdivided into "patient-caregiver education" and "nurse's up-to-date knowledge and skills". In line with the present study, Oshvandi et al suggested that patient education has an impact on HD patients' lifestyles and improves their quality of life (34). Besides, in their study on HD patients, Sadeghian et al emphasized the importance of nurses' knowledge and skills in caring behaviors (35). Having adequate knowledge and skills ensures appropriate and timely treatment and prevents any damage to the patients.

Since the findings of this study, similar to other qualitative studies, might have been affected by the cultural context of the Iranian population, the results cannot be generalized to the target population.

Conclusion

The results of the analysis of 56 interviews with 48 participants on qualified care in HD wards revealed four main themes including (a) physical care, (b) psychological care, (c) ethical care, and (d) extensive skills and knowledge of the nurse. From the patients' and nurses' point of view, empathy and companionship in sessions, fulfilling daily needs, social support, and high-quality dialysis are the concepts of care. Therefore, healthcare planners and HD care providers should pay special attention to the main themes of the present study as well as the patients' expectations of qualified care in their strategic planning and daily interactions with patients.

Acknowledgments

This study reports the results of a master's thesis approved by the Ethics Committee of Qazvin University of Medical Sciences (Ethic code: IR.QUMS.REC.1398.013). The authors would like to thank

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Conflict of Interests

The authors declare that there is no conflict of interest in this study.

Ethical Issues

This study was conducted in accordance with the Declaration of Helsinki and its ethical principles. Moreover, the study was approved by the ethics committee of Qazvin University of Medical Sciences (IR.QUMS.REC.1398.013). All the participants were informed about the study objectives and methods. Participation in the present study was voluntary and participants' decision did not affect their medical care.

References

- Piccoli GB, Alrukhaimi M, Liu ZH, Zakharova E, Levin A. Women and kidney disease: reflections on World Kidney Day 2018. *Clin Kidney J.* 2018;11(1):7-11. doi: 10.1093/ckj/sfx147.
- Saritas SC, Buyukbayram Z. The relation between the spiritual orientation and quality of life in hemodialysis patients. *Med Sci.* 2021;10(1):82-7. doi: 10.5455/medscience.2020.07.138.
- Kaboré J, Metzger M, Helmer C, Berr C, Tzourio C, Druke TB, et al. Hypertension control, apparent treatment resistance, and outcomes in the elderly population with chronic kidney disease. *Kidney Int Rep.* 2017;2(2):180-91. doi: 10.1016/j.ekir.2016.10.006.
- Lonnemann G, Duttlinger J, Hohmann D, Hickstein L, Reichel H. Timely referral to outpatient nephrology care slows progression and reduces treatment costs of chronic kidney diseases. *Kidney Int Rep.* 2017;2(2):142-51. doi: 10.1016/j.ekir.2016.09.062.
- Nobahar M. Changes in the lifestyle from the perspective of hemodialysis patients: content analysis. *J Qual Res Health Sci.* 2018;6(4):373-84. [Persian].
- Polinder-Bos HA, Nacak H, Dekker FW, Bakker SJL, Gaillard C, Gansevoort RT. Low urinary creatinine excretion is associated with self-reported frailty in patients with advanced chronic kidney disease. *Kidney Int Rep.* 2017;2(4):676-85. doi: 10.1016/j.ekir.2017.02.021.
- Henrich WL. *Principles and Practice of Dialysis.* Philadelphia: Lippincott Williams & Wilkins; 2016.
- Narres M, Claessen H, Droste S, Kvitkina T, Koch M, Kuss O, et al. The incidence of end-stage renal disease in the diabetic (compared to the non-diabetic) population: a systematic review. *PLoS One.* 2016;11(1):e0147329. doi: 10.1371/journal.pone.0147329.
- Kazemi S, Didarlo A, Khalkhali H, Feizi A. Studying the relationship between self-efficacy and dietary adherence, in patients under hemodialysis. *J Urmia Nurs Midwifery Fac.* 2018;15(11):835-42. [Persian].
- Gennari FJ. Acid-base homeostasis in dialysis. In: *Handbook of Dialysis Therapy.* Elsevier; 2017. p. 489-97.
- Guenzani D, Buoli M, Carnevali GS, Serati M, Messa P, Vettoretti S. Is there an association between severity of illness and psychiatric symptoms in patients with chronic renal failure? *Psychol Health Med.* 2018;23(8):970-9. doi: 10.1080/13548506.2018.1426868.
- Nisak K, Safrina L, Mawarpury M. Dynamics of hope in hemodialysis patients in R sudza Banda Aceh. In: *Proceedings of the 2nd Syiah Kuala International Conference on Medicine and Health Sciences.* SCITEPRESS; 2018.
- Park EJ, Kim MH. Characteristics of nursing and caring concepts measured in nursing competencies or caring behaviors tools. *J Korean Acad Nurs Adm.* 2016;22(5):480-95.
- Nobahar M. Factors affecting the safety of hemodialysis' patients in dialysis ward and their strengthening strategies. *Koomesh.* 2016;17(3):547-62. [Persian].
- Byrne AL, Baldwin A, Harvey C. Whose centre is it anyway? Defining person-centred care in nursing: An integrative review. *PLoS One.* 2020;15(3):e0229923. Published 2020 Mar 10. doi:10.1371/journal.pone.0229923
- Nguyen DB, Arduino MJ, Patel PR. Hemodialysis-associated infections. In: *Chronic Kidney Disease, Dialysis, and Transplantation.* Elsevier; 2019. p. 389-410.e8. doi: 10.1016/b978-0-323-52978-5.00025-2.
- Wang J, Yue P, Huang J, Xie X, Ling Y, Jia L, et al. Nursing intervention on the compliance of hemodialysis patients with end-stage renal disease: a meta-analysis. *Blood Purif.* 2018;45(1-3):102-9. doi: 10.1159/000484924.
- Haghanizemeydani M, Ahmadi S, Ashouri F, Showani E, Monavari Roozbahani L. Qualitative study of spiritual experiences in nurses of psychiatry wards. *J Qual Res Health Sci.* 2020;8(4):59-67. doi: 10.22062/jqr.2020.90991.
- Naderi S, zaboli r, Khalesi N, Nasiripour AA. The role of medical students in patient safety: a qualitative study. *J Qual Res Health Sci.* 2020;9(3):166-76. doi: 10.22062/jqr.2020.91510.
- Sepahvand R, Morovati H. University excellence with level 5 leadership approach: a qualitative study. *J Qual Res Health Sci.* 2020;9(1):59-69. doi: 10.22062/jqr.2020.90994.
- Seyedein S, Mesbahi M. Nurses' lived experience of green human resource management: a qualitative study. *J Qual Res Health Sci.* 2020;9(3):188-99. doi: 10.22062/jqr.2020.91513.
- da Silva MN, Ferreira EM, Rodrigues FM, Maia AB, de Macedo Alves A, de Leonice Castro K, et al. Nursing care in the hemodialysis room: integrative review. *Int Arch Med.* 2017;10(228):1-7. doi: 10.3823/2498.
- Ashby D, Borman N, Burton J, Corbett R, Davenport A, Farrington K, et al. Renal association clinical practice guideline on haemodialysis. *BMC Nephrol.* 2019;20(1):379. doi: 10.1186/s12882-019-1527-3.
- Dad T, Tighiouart H, Lacson E Jr, Meyer KB, Weiner DE, Richardson MM. Hemodialysis patient characteristics associated with better experience as measured by the In-center Hemodialysis Consumer Assessment of Healthcare Providers and Systems (ICH CAHPS) survey. *BMC Nephrol.* 2018;19(1):340. doi: 10.1186/s12882-018-1147-3.
- Sola L, Levin NW, Johnson DW, Pecoito-Filho R, Aljubori HM, Chen Y, et al. Development of a framework for minimum and optimal safety and quality standards for hemodialysis and peritoneal dialysis. *Kidney Int Suppl (2011).* 2020;10(1):e55-e62. doi: 10.1016/j.kisu.2019.11.009.
- Mehrotra R, Cheung AK, Meyer T, Nath KA. Vascular access for hemodialysis and value-based purchasing for ESRD. *J Am Soc Nephrol.* 2017;28(2):395-7. doi: 10.1681/asn.2016070769.
- Li KJ, Chen L. Association between duration of dialysis and *Helicobacter pylori* infection in dialysis patients: a meta-analysis. *Int Urol Nephrol.* 2019;51(8):1361-70. doi: 10.1007/s11255-019-02205-2.
- Garthwaite E, Reddy V, Douthwaite S, Lines S, Tyerman K, Eccles J. Clinical practice guideline management of blood borne viruses within the haemodialysis unit. *BMC Nephrol.* 2019;20(1):388. doi: 10.1186/s12882-019-1529-1.
- Lee JJ, Hwang SJ, Huang JF. Review of the present features and the infection control challenges of COVID-19 pandemic in dialysis facilities. *Kaohsiung J Med Sci.* 2020;36(6):393-8. doi: 10.1002/kjm2.12239.
- Khaki S, Esmailpourzanjani S, Mashouf S. Nursing cares quality in nurses. *Scientific Journal of Nursing, Midwifery*

- and Paramedical Faculty. 2018;3(4):1-14. doi: [10.29252/sjnmp.3.4.1](https://doi.org/10.29252/sjnmp.3.4.1). [Persian].
31. Nobahar M, Saffari M, Babamohamadi H, Sotodehasl N. Exploration of adjustment in hemodialysis patients: qualitative content analysis. *Koomesh*. 2016;19(1):164-74. [Persian].
 32. Mohammadi M, Peyrovi H, Mahmoodi M. The relationship between professional quality of life and caring ability in critical care nurses. *Dimens Crit Care Nurs*. 2017;36(5):273-7. doi: [10.1097/dcc.0000000000000263](https://doi.org/10.1097/dcc.0000000000000263).
 33. Omid N, Asgari H, Omid MR. The relationship between professional ethics and the efficiency of the nurses employed in Imam hospital and Mostafa Khomeini hospital in Ilam. *Iran J Med Ethics Hist Med*. 2016;9(3):65-73. [Persian].
 34. Oshvandi K, Salavati M, Ahmadi F, Soltanian A. The effect of training on hemodialysis patients' lifestyle promotion. *Avicenna J Nurs Midwifery Care*. 2018;26(3):165-72. doi: [10.30699/sjnmf.26.3.165](https://doi.org/10.30699/sjnmf.26.3.165). [Persian].
 35. Sadeghian Z, Shahgholian N, Dashti-Dehkordi A. Hemodialysis patients and nurses in relation with caring behaviors. *J Urmia Nurs Midwifery Fac*. 2017;15(9):659-66. [Persian].

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