Original Research Paper

The Knowledge Level of Elderly in Puskesmas Taliwang and the Incidence of Chronic Kidney Disease in 2024

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Abstract: Chronic Kidney Disease (CKD) is a gradually progressing condition that frequently remains asymptomatic in it's early stages, making it an increasingly significant public health concern, particularly among the elderly. Early awareness and preventive behavior are crucial to mitigate it's impact, yet many elderly individuals lack sufficient knowledge about disease. This study aims to examine the relationship between the knowledge level of elderly individuals and the incidence of CKD in the Puskesmas Taliwang area in 2024. A cross-sectional analytical study was conducted involving 30 elderly participants selected through simple random sampling. Data on knowledge level were collected using a structured was performed using the Chi-square test. The result showed a significant association was found between knowledge level and CKD incidence P-value=0.000 and OR value is between 0,900 and 1,020, indicating that lower knowledge correlates with a higher risk of CKD. There is a significant relation between the knowledge level of elderly individuals and the incidence of CKD in the Puskesmas Taliwang area. Strengthening educational outreach and awareness programs is essential to reduce CKD risk among the elderly.

Keywords: Chronic kidney disease, elderly, knowledge level, knowledge level, Puskesmas Taliwang.

Introduction

Chronic Kidney Disease (CKD) is a serious public health problem, 200 cases per million per year reached in many countries are reported, with the prevalence 11.5% (4.8% in stages 1-2 and 6.7% in stages 3-5) (Levey, 2012). Individuals belonging to the lowest socioeconomic quartile exhibit a 60% greater risk of developing progressive chronic kidney disease (CKD) compared to those in the highest quartile. Within nations, disparities in CKD prevalence, incidence, and progression are also evident across different ethnic and socioeconomic groups. In both high-and middle-income countries, approximately one in ten individuals is affected by CKD, with the leading causes including diabetes mellitus, hypertension, and glomerunephritis (Webster, 2017). In the Asian region, particularly in Eastern, Southern, and Southeastern Asia, an estimated 434.3 million adults (95% CI : 350.2-519.7 million) are living with CKD, of which 315.2 million cases (95% CI : 236.0 – 396.1 million) are supported by population-based studies. Among these, 65.5 million individuals (95% CI : 42.2-94.9 million) have advanced stages of CKD, with 45.8 million cases (95% CI : 27.2-67.6 million) confirmed through population-based data (Liyanage, 2021). In Indonesia, data from the Ministry of Health's Basic Health Research indicated an increase in CKD prevalence, from 0.2% in 2013 to 0.3% in 2018 (Riset Kesehatan Dasar, 2018).

Chronic Kidney Disease (CKD) is characterized by structural and / or functional abnormalities of the kidneys that persist over time. It typically follows a slow and progressive course and is considered irreversible (Ammirati,

2020). The clinical definition of CKD includes either a glomerular filtration rate (GFR) of less than 60 mL/min/1.73m^2, the presence of markers of kidney damage, or both, sustained for a minimum duration of three months. According to the World Health Organization, the elderly population is defined as individuals aged 55 to 65 years and above. Notably, over 80% of patients undergoing treatment for End-Stage Kidney Disease (ESKD) reside in countries with a high proportion of elderly individuals and established access to affordable health care services ≥ (Webster, 2017) across high-, middle-, and several low-income countries, the primary causes of CKD are diabetes mellitus and hypertension (Webster, 2017).

International clinical guidelines stipulate that a CKD diagnosis is confirmed when at least one of two conditions is present for a duration of three months or longer : GFR < 60 mL/min/1.73m^2 (categories G3a to G5), or evidence of kidney damage, such as albuminuria (ACR ≥ 30 mg/g), abnormal urinary sediment, structural kidney abnormalities on imaging, or a history of kidney transplantation. The classification of CKD is based on estimated Glomerular Filtration Rate (eGFR), a key indicator of renal function. In Stage 1, eGFR is ≥ 90 mL/min/1.73m^2, suggesting kidney damage with preserved filtration. Stage 2 corresponds to an eGFR between 60-89 mL/min/1.73m^2, reflecting mild functional decline.

Stages 3a and 3b indicate moderate reduction, with values of 45-59 and 30-44 mL/min/ eGFR 1.73m^2, respectively. In Stage 4, eGFR falls further to 15-29 mL/min/1.73m^2, representing severe impairment. Stage 5 denotes kidney failure, with eGFR dropping below 15mL/min1.73m^2, often necessitating dialysis or kidney transplantation. This staging system plays a critical role in guiding clinical decision-making and determining appropriate therapeutic interventions for CKD patients. Knowledge of the disease is needed as one of the prevention efforts. Beaglehole (WHO, 1993) divides prevention efforts into 3 parts. In Primary Prevention, namely Health Promotion, aims to increase public knowledge of the disease. This is needed to reduce the incidence rate so that it can improve the quality of life of the community.

Further investigation is warranted to evaluate the level pf knowledge among elderly individuals regarding CKD and its potential association with CKD incidence. Such research could serve as a valuable foundation for the development of targeted and effective educational interventions. This study spesifically seeks to assess the knowledge levels of elderly individuals at Puskesmas Taliwang and examine their correlation with the incidence of CKD.

The findings are expected to offer a scientific basis for designing more impactful health education programs aimed at lowering CKD prevalence and enhancing quality of life among the elderly population. The health-related quality of life of individuals living with CKD is shaped by their multifaceted experiences with the disease, which span several dimensions or domains. These may include the presence of CKD-related symptoms and other comorbid conditions. Compared to the general population, individuals with CKD consistently report significantly lower health-related quality of life, highlighting the importance of comprehensive care strategies that go beyond clinical treatment alone (Webster, 2017)

Matherial and Methods

This study was conducted in Puskesmas Taliwang, Lombok, Nusa Tenggara Barat, in December 2024, chosen based on 30 elderly with age equal to or more than 60 year. This study seeks to investigate the association between the knowledge level of elderly individuals and the incidence of CKD, utilizing a quantitative research design with a cross-sectional analytical approach. The target population comprises all elderly individuals registered at Puskesmas Taliwang as of December 2024. A total of 30 participants were selected through purposive sampling, based on clearly defined inclusion and exclusion criteria. Data collection involved direct interviews using the questionnaire and data recording tools.

The questionnaire used to conduct the survey consisted of 10 questions. First, definition is do respondents know what CKD is. Then, do respondents know the risk factors for CKD. The high risk factors of CKD is hypertension (98%), heart failure (72%), and diabetes (44%) (Tio, 2024). The next question is to ask about physical examinations and supporting examinations for early detection of CKD includes urine

examination, kidney function examination, radiological examination, and kidney biopsy (Anggraini, 2022). Diagnosis CKD based on normal limits of examination results.

The next question is, ask the respondents about preventive ways to CKD including blood pressure control, glycemic control, physical activity & lifestyle modifications, and kidney function surveillance and monitoring (Pradhan, 2023). Then ask the respondents about adopted healthy lifestyle as an effort to prevent CKD. The next question is about drinking alcohol and smoking habits, cause drinking alcohol and smoking can be risk factors for CKD.

The study begin with obtaining ethical approval and informed consent from the respondents. Data were gathered thorough interviews assessing respondents knowledge of CKD, which were recorded and categorized according to predetermined scales. The incidence of CKD was confirmed based on medical diagnoses provide by a doctor. The collected data were analyzed using SPSS software. Univariate anaylisis was conducted to describe respondent characteristics based on age, gender, education level, and occupation. Bivariate analysis using the Chi-square test was performed to examine the relationship between knowledge level and CKD incidence, with a significance criterion of p-value < 0.05.

Result and Discussion

This study is involved 30 elderly respondents in Puskemas Taliwang, in December 2024. The age of the elderly is equal to or more than 60. Jobs consist of civil servants and housewives.

Elderly Knowledge Level on CKD

Table 1 presents the mean, minimum, and maximum scores of elderly individuals knowledge regarding Chronic Kidney Disease (CKD) across several key aspects. The highest average scores were found in the categories of "Dangers of Drinking Alcohol" (60,01) and "Dangers of Smoking" (50,49), indicating a relatively high awareness among the elderly about harmful habits that can effect kidney health. In contrast, the lowest scores were seen in "Diagnosis" (10,01) and "Risk Factors" (10,07), reflecting a lack of understanding regarding the

clinical aspects and etiology of CKD.

Table 1. Questionnaire Score Data on Elderly Knowledge Levels of CKD

Variable	Mean	Min	Max
Definition	30,91	15,60	60,01
Risk Factors	10,07	10,23	20,89
Physical Examination	10,07		
Supporting Examination	20,10	25,00	56,01
Diagnosis	10,01	20,04	25,09
How to Prevent	30,00	30,00	60,00
Healthy Lifestyle	50,08	40,02	80,00
Therapy	20,80	20,10	40,20
Dangers of Drinking Alcohol	60,01	60,01	80,09
Dangers of Smoking	50,49	50,50	80,02

Table 2 displays the analysis of the relationship between knowledge level and CKD incidence. The Odds Ratio (OR) is 0,90 (95% CI : 0,900-1,020) with a p-value of 0,000 showing statistically significant association. This suggests that increased knowledge among the elderly is correlated with a decreased incidence of CKD.

Table 2 Analysis of Questionnaire Scores of Elderly Knowledge Levels of CKD

Variable	OR (95% CI)	P value
CKD	Ref	0,000
Yes	0,90 (0,900-	
No	1,020)	

The Relationship Between Elderly Knowledge Level on CKD

This study reveals that elderly individuals exhibit varying levels of knowledge about CKD. The high scores in aspects such as the dangers of alcohol and smoking suggest that lifestyle-related health messages are more accessible or more frequently communicated. Meanwhile, the low scores in the areas of diagnosis and risk factors indicate a knowledge gap concerning medical and diagnostic aspects of CKD.

These findings are consistent with a study by Ratnasari, et al. (2021), which found that most

CKD patients had limited understanding of the clinical dimensions of their condition but were more familiar with general or commonly disseminated health messages, their study also showed that better knowledge of CKD was associated with improved quality of life and treatment adherence. The statistically significant result in table strengthens the hypothesis that increasing knowledge plays a vital role in CKD prevention. The OR value of less than 1 indicates that higher knowledge levels are associated with a lower likelihood of developing CKD. This finding is also supported by Subekti (2020)l who found a strong relationship between dietary knowledge and dietary compliance among CKD patients at Husada Utama Hospital, Surabaya. Patients with better dietary understanding were more likely to follow renal diet guidelines, thereby preventing disease progression.

Furthermore, Yulianto and Cahyono (2023) found that knowledge positively influenced patient compliance in limiting fluid intake, an essential part of CKD management. Elderly individuals who understood the importance of fluid restriction were more likely to follow medical recommendations consistently. These findings have practical implications. Structured health education focused on underrepresented aspect such ad diagnosis and risk factors could be an effective preventive strategy. Health cadres and medical staff in primary care settings, such as community health center, could develop outreach programs that emphasize these critical yet less understood topics.

Awareness of Chronic Kidney Disease (CKD) and it's associated risk factors is essential for the elderly population, given the high prevalence of CKD within this age group. This heightened prevalence is largely attributed to the increase incidence of risk factors such as diabetes mellitus, hypertension, and cardiovascular disease. Advancing age is correlated with a greater likelihood of developing CKD (Mallapalil, 2014). Empirical evidence shows a statistically significant relationship between an individual's level of knowledge and the incidence of CKD. The growing burden of CKD has been linked to limited public awareness, underscoring the importance of disseminating health education. As the general population becomes more informed about CKD, individuals are more likely to implement effective preventive and management strategies (Albuquerque, 2022).

Conclusion

Level of knowledge of the elderly and the incidence of CKD has a relationship proven by P-value = 0,000 statistically. Overall, this study indicates that knowledge levels among the elderly have a significant influence on CKD incidence. Health education serves as a key preventive and control strategy, particularly by increasing understanding of risk factors, diagnosis, and healthy lifestyles. A comprehensive and continuous educational approach should be integrated into primary healthcare services.

Acknowledgment

References

Agarwal, P., Garg, S., & Agarwal, A. (2021). Chronic kidney disease-associated pruritus. *Toxins* 13 (8), 527. https://doi.org/10.3390/toxins13080527.

Albuquerque, A.C.R.M. (2022). Population knowledge on chronic kidney disease, its risk factors and means of prevention : A Population-based Study in Fortaleza, Ceara, Brazil. *Journal of Nephrology & Renal Therapy*, 8(1), 1–7.

Ammirati, A.L. (2020) chronic kidney disease. *Revista da Associação Médica Brasileira*, 66(Suppl 1), 3–9. http://dx.doi.org/10.1590/1806-9282.66.S1.3

Anggraini, D. (2022). Aspek klinis dan pemeriksaan laboratorium penyakit ginjal kronik. *An-Nadaa: Jurnal Kesehatan*

Masyarakat, 9 (2), 236-239 https://ojs.uniska-bjm.ac.id/index.php/ANN/article/view/9229

Gliselda, V.K. (2021). Diagnosis dan manajemen penyakit ginjal kronis (PGK). *Jurnal Medika Hutama.* 2 (4), 45-52

Hebert, S.A & Ibrahim, H.N. (2022). hypertension management in patient with chronic kidney disease. *Methodist DeBakey Cardiovascular Journal,* 18 (4), 41-49. https://doi.org/10.14797/mdcvj.1119

Hill, N.R., Fatoba, S.T., Oke, J.L., Hirst, J.A., O'Callaghan,C.A., Lasserson, D.S., & Hobbs, F.D.R. (2016). Global prevalence of chronic kidney disease – A systematic review and meta analysis. *PLOS ONE*, 11(7), e0158765. https://doi.org/10.1371/journal.pone.0158765SCIRP+6SCIRP+6PLOS+6

Hustrini, N.M. (2023). Chronic kidney disease care in Indonesia: Challenges and opportunities. (2023). *Acta Medica Indonesiana,* 55(1), 1-8.

Jha, V., Garcia, G., Iseki, K., Li, Z., Naicker, S., Plattner, B., ... & Yang, C.W. (2023). Global economic burden associated with chronic kidney disease: A pragmatic review of medical costs for the inside CKD Research Programme. *Advance in Therapy* 40, 4405–4420 https://doi.org/10.1007/s12325-023-02608-9

Kidney Care UK. Chronic kidney disease (CKD) stages 3b-5. British Association for Paediatric Nephrology. https://infokid.org.uk/conditions/chronic-kidney-disease-ckd-stages-3b-5/

Levey, A.S., de Jong,P. E., Coresh, J., El Nahas, M., Astor, B.C., Matsushita, K., … & Eckardt, K.U. (2011). The Definition, classification, and prognosis of chronic kidney disease: a KDIGO controversies conference report. *Kidney International,* 80(1), 17-28. https://doi.org/10.1038/ki.2010.483

Li, X & Lindholm, B. (2022). Cardiovascular risk prediction in chronic kidney disease. *American Journal of Nephrology,* 53(1), 1-10. https://doi.org/10.1159/000528560

Liyanage, T, et al. (2022). Prevalence of Chronic Kidney Disease in Asia : A Systemic Review and Analysis. *BMJ Global Health.*

Mallapalil, M., Friedman, E.A., Delano, B.G., McFarlane, S.I., & Salifu, M.O. (2014). Chronic kidney disease in the elderly: evaluation and management. *Clinical Practice,* 11(5), 525-535. https://doi.org/10.2217/cpr.14.46

Mills, K.T., Xu, Y., Zhang, W., Bundy, J.D., Chen, C.S., Kelly, T.N., … & He, J. et (2015). A systematic analysis of world-wide population-based data on the global burden of chronic kidney disease in 2010. *Kidney International,* 88(5), 950-957. https://doi.org/10.108/ki.2015.230

Pradhnan, N. & Dobre, M. (2023). Emerging preventive strategies in chronic kidney disease: Recent evidence and gaps in knowledge. *Kidney International Reports,* 8(1), 1-10. https://doi.org/10/1016/j.ekir.2022.20.003

Pratiwi, A.D., Setiyaningsih, D. R., & Nurhayati, N. (2023). Hubungan pengetahuan pasien dengan kepatuhan terapi hemodialis di RS dr. Soepraoen Malang. *Jurnal Medika Farma, 3 (1),* 20-26. https://www.jurnalfarmasidankesehatan.ac.id/index.php/medfarm/article/view/222

Ratnasari, N. M., Suarjana, K. G., & Wirasuta, I. M. A. (2021). Hubungan antara Tingkat pengetahuan dengan kualitas hidup pasien gagal ginjal kronik yang menjalani hemodialisis di RSUD Wangaya Kota Denpasat. *Pharmacoscript, 1 (2),* 72-82. https://e-journal.unpar.ac.id/index.php/PHARMACOSCRIPT/article/view/964

Ratnasari, N. M., Suarjana, K. G., & Wirasuta, I. M. A. (2021). Pengaruh tingkat pengetahuan terhadap kepatuhan pengobatan pasien gagal ginjal kronik. *Jurnal Farmasi Unwahas, 9 (2),* 129-135.

Sitepu, D.E., Primadiamanti, A. & Safitri, E. I. (2024). Hubungan usia, pekerjaan dan pendidikan pasien terhadap tingkat pengetahuan DAGUSIBU di Puskesmas wilayah Lampung Tengah. *Jurnal Ilmiah*

Wahana Pendidikan, 10(1), 45-52. https://doi.org/10.5281/zenodo.10642605

Subekti, W. (2022). Hubungan Tingkat pengetahuan diet pada pasien penyakit ginjal kronis di RS Husada Utama Surabaya. . *Jurnal PIPK Dian Husada, 7 (1),* 45-52. https://3-journal.lppmdianhusada.ac.id/index.php/PIPK/article/view/340

The National Institute of Health Research and Development, Indonesian Ministry of Health. *Laporan Riset Kesehatan Dasar (Riskesdas) 2007.* Jakarta : Indonesian Ministry Retrieved April 12, 2025, from https://infokid.org.uk/conditions/chronic-kidney-disease-ckd-stages-3b-5/of Health; 2007.

Tio, M.C. (2024). Individualized risk of CKD progression among US Adults. *Jornal of the American Society of Nephrology,* 35(6), 1076-1083, 35 (6), 1076–1083, https://doi.org/10.1681/ASN.0000000000000377

Webster, A. C., Nagler, E. V., Morton, R, L., & Masson, P. (2017). Chronic kidney disease. *The Lancet,* 389 (10075), 1238-1252. https://doi.org/10.1016/S0140-6736(16)32064-5

World Health Organization. (2013). *Global Brief on Hypertension: Silent Killer, Global Public Health Crisis* Geneva: WHO.

Yulianto, E., & Cahyono, S. (2023). Hubungan Tingkat pengetahuan dengan kepatuhan pembatasan cairan pada pasien gagal ginjal kronik di RS Gatoel Mojokerto. *Jurnal PIPK Dian Husada, 8 (1),* 35-41. https://e-journal.lppmdianhusada.ac.id/index.php/PIPK/article/view/309