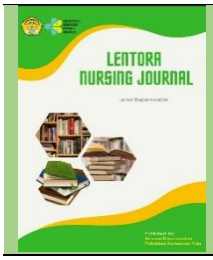

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Knowledge of Chronic Kidney Disease Risk Among Diabetic Patients at Talise Public Health Center

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ABSTRACT

Background: *Chronic Kidney Disease (CKD) is a serious complication of diabetes mellitus, often leading to end-stage renal failure. Patient knowledge is a critical factor in preventing or slowing its progression. This study* ***aimed*** *to assess the level of knowledge regarding CKD risk among diabetic patients.*

Methods*: A descriptive quantitative study was conducted in the working area of Talise Public Health Center, Palu. From a total population of 219, a sample of 69 respondents was selected using cluster random sampling. Data were collected using a structured questionnaire assessing knowledge of CKD etiology, symptoms, and risk factors. Knowledge levels were categorized as good, sufficient, or poor based on total scores.*

Results: *The study found that less than half of the respondents (37.7%) had good knowledge of CKD risks. A plurality (47.8%) had sufficient knowledge, while 14.5% had poor knowledge.*

Conclusion: *While most diabetic patients in this setting possess at least sufficient knowledge, the proportion with good knowledge remains under 40%. This indicates a significant need for enhanced and targeted patient education programs to improve understanding of CKD risks. Future research should investigate determinants of knowledge and develop effective community-based interventions for CKD prevention.*

INTRODUCTION

Chronic Kidney Disease (CKD) represents a formidable and escalating global health challenge, characterized by its irreversible progression and severe clinical and economic consequences. As a condition marked by the permanent structural and functional decline of the kidneys, CKD frequently culminates in end-stage renal disease (ESRD), necessitating life-sustaining but resource-intensive dialysis or kidney transplantation (Cahyani, 2022). This burden is not confined to high-income nations; it is acutely felt across low- and middle-income countries, including Indonesia, where health systems grapple with the dual challenges of communicable diseases and a rising tide of non-communicable diseases (NCDs).

The epidemiology of CKD is intrinsically linked to the growing prevalence of its primary etiological drivers: hypertension and diabetes mellitus (DM). These two conditions account for the majority of CKD cases worldwide, with diabetic nephropathy emerging as the leading cause of ESRD (Ririen et al., 2023).The Indonesian context mirrors this global trend. National data reveals a significant CKD burden, with approximately 638,178 affected individuals. Regional disparities are evident, with Central Sulawesi reporting a prevalence of 0.28%, translating to an estimated 6,851 people (Indonesian Ministry of Health, 2023). The trajectory is concerning; given the high and rising prevalence of key risk factors within the population, a continued increase in CKD incidence is projected (Ariyanti & Wdijati, 2020).

This projection is grounded in local evidence. Within Palu, data from UNDATA Regional Hospital in 2023 confirms the significant role of DM, identifying it as the second most common cause of CKD cases (Ririen et al., 2023).The scale of the at-risk population is substantial, with over 6,200 individuals recorded with DM in Palu City (Dinkes, 2023).This risk is further concentrated at the primary care level, as exemplified by the Talise Community Health Center, which registered 219 DM patients within an eight-month period in 2024. While numerous risk factors contribute to CKD—including hypertension, glomerular, and tubulointerstitial diseases—DM remains a predominant and high-risk precursor (Sakti et al., 2024).

However, the presence of a biomedical risk factor does not automatically translate to patient engagement in preventive behaviors. A critical mediator in this pathway is patient knowledge and awareness. Evidence consistently indicates that awareness of CKD, its risk factors, and its link to conditions like DM is strikingly low, even among high-risk groups. This knowledge deficit is not a passive issue; it is an active determinant of health outcomes. Poor knowledge is a recognized barrier to early detection, timely intervention, and adherence to management plans, thereby accelerating disease progression (Wolide et al., 2020). In the context of DM management, where self-care and proactive screening are paramount, understanding one's personal risk for CKD is fundamental for motivating protective actions.

Despite the clear importance of this knowledge, there is a pronounced lack of granular data assessing the specific level of CKD risk awareness among diabetic patients managed in primary healthcare settings in Indonesia, particularly in Eastern regions like Central Sulawesi. Community Health Centers (*Puskesmas*), such as Talise, serve as the frontline for chronic disease management and health promotion. Understanding the baseline knowledge of their enrolled diabetic patients is an essential prerequisite for designing effective, localized, and culturally appropriate educational interventions.

Therefore, this study is designed to address this identified gap. It aims to assess

and describe the level of knowledge regarding CKD risk among patients with diabetes mellitus in the working area of the Talise Community Health Center, Palu City. The findings from this descriptive investigation will provide essential empirical evidence to inform the development of targeted public health strategies and patient education programs, ultimately aiming to mitigate the future burden of CKD in this vulnerable community.

METHODS

Research Design

This study employed a descriptive cross-sectional design with a quantitative approach. The aim was to describe the level of knowledge regarding Chronic Kidney Disease (CKD) risk among patients with diabetes mellitus (DM).

Population and Sample

The study population comprised all DM patients (N=219) registered at the Talise Community Health Center from January to August 2024. The sample size was determined using the Slovin formula (with a 10% margin of error), yielding a minimum of 69 respondents. A two-stage cluster random sampling technique was applied. First, all four community health center working areas —Talise, Talise Valangguni, Tondo, and Layana Indah—were selected as clusters. Subsequently, a proportional allocation method was used to calculate the number of respondents sampled from each cluster based on its population size (see Table 1). Within each cluster, respondents were selected using a simple random sampling method from the patient registry.

Table 1. Sample Distribution by Working Area of Talise Community Health Center

No.	Working area	Number of DM Patients	Number of samples
1	Talise	98	31
2	Talise valangguni	47	15
3	Tondo	63	20
4	Layana indah	11	3
	Total	219	69

Data Collection Instrument and Procedure

Data were collected using a structured questionnaire adapted from previous studies and validated for content by two public health experts. The questionnaire consisted of three parts: 1) socio-demographic characteristics, 2) clinical history, and 3) knowledge of CKD risk. The knowledge section contained 15 multiple-choice questions covering domains such as CKD etiology, symptoms, risk factors (especially related to DM), and preventive behaviors. Knowledge scores were calculated by summing correct answers. Respondents were categorized into three levels: Good (score 76-100%), Sufficient (score 56-75%), and Poor (score ≤55%). Data collection was conducted through face-to-face interviews by trained enumerators during patient visits to the health center.

Data Analysis

The collected data were processed and analyzed descriptively using statistical software.

RESULT

A. Sociodemographic Characteristics of Respondents

The sociodemographic profile of the 69 diabetic patients surveyed is presented in Table 2. The cohort was predominantly middle-aged and elderly, with the largest proportion (43.5%) belonging to the 55-64 years age group, followed by those aged 65-80 years (29.0%). Females constituted the majority of respondents (68.1%). Regarding educational attainment, one-third (33.3%) had completed junior high school, while a notable 23.2% had only elementary-level education. In terms of occupation, housewives were the largest group (39.1%), followed by merchants (23.2%).

Table 2. Sociodemographic Characteristics of Diabetic Patients (N=69)

Characteristics	Frequency	Percentage
Age (years)		
30-54	19	27,5
55-64	30	43,5
65-80	20	29,0
Gender		
Male	22	31,9
Female	47	68,1
Highest Education		
No Formal Schooling	4	5,8
Elementary School	16	23,2
Junior High School	23	33.3
Senior High School	14	20,3
Diploma/University	12	17,4
Occupation		
Housewife	27	39,1
Merchant	16	23,2
Entrepreneur	9	13,0
Civil Servant	7	10,1
Unemployed	7	10,1
Private Employee	3	4,3

B. Level of Knowledge Regarding CKD Risk

The distribution of CKD risk knowledge levels among respondents is shown in Table 3. The most prevalent category was adequate knowledge, with 33 respondents (47.8%). A significant proportion, 26 respondents (37.7%), demonstrated good knowledge. Conversely, 10 respondents (14.5%) were categorized as having poor knowledge.

Table 3. Distribution of CKD Risk Knowledge Levels Among Respondents (N=69)

Level of knowledge	Frequency (n)	Percentage (%)
Good	26	37,7
Sufficient	33	47,8
Poor	10	14,5
Total	69	100

DISCUSSION

This study provides a critical snapshot of CKD risk knowledge among diabetic patients in a primary care setting in Palu, Indonesia. The central finding that less than half (37.7%) of respondents possessed good knowledge illuminates a significant gap in patient awareness that has direct implications for CKD prevention efforts. This aligns with a global corpus of literature reporting suboptimal CKD awareness among high-risk populations. For instance, studies in both high-income and low-and-middle-income countries consistently find that a majority of patients with diabetes are unaware of their heightened risk for kidney disease (Tuot et al., 2019). The fact that 47.8% of our cohort had only adequate knowledge underscores a state of partial understanding that may be insufficient to motivate the sustained behavioral changes necessary for risk mitigation, such as stringent glycemic control, regular urine albumin screening, and adherence to renoprotective medications (Narva et al., 2015).

The sociodemographic profile of our respondents offers vital context for interpreting these knowledge levels. The predominance of middle-aged and older adults (72.5% aged ≥55 years) and individuals with limited formal education (over half with junior high school education or less) identifies key subgroups that are particularly vulnerable. These findings resonate with established evidence linking lower health literacy to older age and lower educational attainment (Berkman et al., 2011). Health literacy, the capacity to obtain, process, and understand basic health information, is a foundational prerequisite for disease-specific knowledge (Nutbeam, 2008). Our observational trend suggesting poorer knowledge among older and less-educated respondents is thus not surprising and highlights a critical target for intervention. Tailored educational strategies that move beyond written materials to incorporate visual aids, verbal counseling, and family involvement are essential for these groups (Mayer & Villaire, 2021).

The high proportion of female respondents (68.1%), predominantly housewives, presents another important dimension. While this likely reflects healthcare-seeking patterns rather than population prevalence, it indicates that women are a primary audience for clinic-based education. This offers an opportunity, as studies suggest women often function as health gatekeepers for their families, potentially amplifying the impact of knowledge gained (Gipson et al., 2019). However, educational content must be accessible and relevant, avoiding overly technical language to ensure comprehension across varied literacy levels (Dickens & Piano, 2013).

Our finding that a notable minority (14.5%) had poor knowledge is a cause for concern. This group is at the highest risk for delayed diagnosis and adverse outcomes, as poor disease awareness is a strong predictorB/ of late presentation to nephrology care and faster CKD progression (Plantinga et al., 2020). In a resource-constrained setting like ours, preventing progression to end-stage renal disease (ESRD) is a public health imperative due to the catastrophic costs of dialysis (Jha et al., 2022). Therefore, primary healthcare centers must implement systematic, protocol-driven screening for

CKD knowledge alongside biomedical screening for the disease itself. Simple, validated questionnaires can be integrated into routine diabetes visits to identify knowledge deficits in real-time (Wright-Nunes et al., 2021).

The implications for clinical practice and health policy are clear. First, the documented knowledge gap calls for an immediate, structured educational intervention at the Talise Community Health Center. This should be based on adult learning principles, culturally adapted, and focused on actionable messages (Moran et al., 2021). Second, our data argue for integrating CKD education into Indonesia's standardized diabetes management protocol (PROLANIS). A multi-modal approach—combining brief counseling from healthcare providers, take-home visual materials, and support from community health workers (*kader*)—is likely to be most effective (Vassalotti et al., 2022). Finally, empowering patients with knowledge is a cornerstone of patient-centered care, which has been shown to improve self-efficacy, adherence, and clinical outcomes in chronic disease management (Alegría et al., 2018).

Study Limitations and Future Research

This study has limitations inherent to its descriptive cross-sectional design. The sample, while calculated appropriately, is from a single health center, limiting generalizability. The knowledge assessment, though structured, may not capture deeper comprehension or real-world application. Most importantly, the observed associations between demographics and knowledge level are preliminary and require confirmation through analytical studies with appropriate statistical testing. Future research should employ case-control or cohort designs to definitively identify the determinants of CKD knowledge in this population. Furthermore, intervention studies are needed to develop and test the efficacy of culturally tailored educational tools aimed at raising awareness and, ultimately, changing health behaviors to curb the growing burden of CKD in Indonesia.

CONCLUSIONS AND SUGGESTIONS

This study concludes that CKD risk knowledge among diabetic patients in this primary care setting is suboptimal, with only 37.7% possessing good awareness. The findings highlight a critical educational gap in a population characterized by older age and limited formal education. Immediate integration of structured CKD education into routine diabetes consultations at the health center level is essential, utilizing visual and simplified materials tailored for low-literacy patients. Future research should employ analytic designs to confirm knowledge determinants and develop tested educational interventions.

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