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Does Digital Aging, Social Capital, and Macroeconomic Factors Matter in Recovery Advancement of Geriatric Renal Disease?

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Objectives : Indonesia is entering an aging society with population aged 60+ reaching 32.4 million people or (12%) in 2024. Renal disease is the highest comorbid factor in increasing mortality rate by 19.5 times in the elderly and 60% of the elderly patients must undergo dialysis. Geriatric renal disease recovery is influenced by multiple factors, including digital aging, social capital, dietary intake, and macroeconomic conditions. This study investigates how digital engagement, social capital, and economic indicators impact post-treatment recovery.
Methods : Using Indonesia Family Life Survey (IFLS), World Bank, and UNDP, dependent variable was post-treatment recovery outcomes (WHOQOL-BREF scores). Independent variables included digital device use (using smartphones for health tracking, online consultations, social interactions), social capital (community participation, social network size), dietary intake (caloric and protein consumption), GDP per capita, and healthcare expenditure. Control variables included age, gender, education, comorbidities, and household income. Mental health was assessed using the Geriatric Depression Scale (GDS). Multiple regression analysis, interaction effect modeling, and structural equation modeling (SEM) were conducted.
Results : Higher digital device use (β=0.45, p=0.001) improved recovery, indicating digital literacy's role in elderly healthcare engagement. Social capital (β=0.38, p=0.005) positively influenced recovery, suggesting that community involvement enhances well-being. Higher protein intake (β=0.40, p=0.001) and caloric consumption (β=0.30, p=0.002) were associated with better health outcomes. Macroeconomics variables depict in GDP per capita (β=0.22, p=0.015) and healthcare spending (β=0.33, p = 0.008) significantly improved recovery, emphasizing the importance of public health investments. Depression negatively affected recovery (β=-0.42, p=0.002), but digital engagement and social capital moderated this effect.
Conclusions : Digital aging and social capital significantly enhance geriatric renal disease recovery, while economic conditions and mental health play critical roles. Policies should promote digital health literacy, community-based programs, and mental health interventions to improve elderly healthcare outcomes. Increased healthcare investments are essential for better recovery rates.

Picture 1. Regression Analysis- Identifying Key Drivers of Recovery Outcomes.jpg

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Predictor Variable	Coefficient (β)	p-value	Interpretation
Digital Device Use	0.45	0.001	More digital engagement improves recovery.
Community Activity (Social Capital)	0.38	0.005	Socially active patients recover better.
Social Network Size	0.25	0.010	A larger social network leads to better outcomes.
Caloric Intake	0.30	0.002	Higher calorie consumption aids recovery.
Protein Intake	0.40	0.001	More protein intake correlates with better health scores.
Geriatric Depression Scale	-0.42	0.002	Higher depression scores worsen recovery.
GDP per capita	0.22	0.015	A stronger economy correlates with better health outcomes.
Healthcare Expenditure	0.33	0.008	Increased healthcare investment enhances recovery.
Digital Aging × Mental Health (Interaction Term)	0.21	0.009	Digital engagement reduces the negative impact of depression.
Social Capital × Mental Health (Interaction Term)	0.28	0.006	Social capital buffers against depression's negative effects.
Age	-0.28	0.012	Older individuals tend to recover more slowly.
Gender (Male = 1, Female = 0)	0.12	0.045	Men showed slightly better recovery.
Education Level	0.18	0.020	More education correlates with improved recovery.
Comorbidities	-0.35	0.003	Having multiple illnesses slows recovery.
Household Income	0.15	0.032	Wealthier individuals recover better.