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Effect of Social Capital on Tertiary Preventive Behavior among Older Adults with Type 2 Diabetes Mellitus: A Structural Equation Modeling Approach

Anna Nugrahani[1)], Bhisma Murti[1)] Setyo Sri Rahardjo[2)], Argyo Demartoto[3)], Revi Gama Hatta Novika[1)]

[1)]Master's Program in Public Health, Universitas Sebelas Maret, Indonesia
[2)]Faculty of Medicine, Universitas Sebelas Maret, Indonesia
[3)]Faculty of Social and Political Science, Universitas Sebelas Maret

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ABSTRACT

Background: Diabetes Mellitus (DM), known as the "silent killer," continues to show an increasing number of cases. It has emerged as one of the most serious and common chronic diseases, leading to life-threatening complications, disability, and reduced life expectancy. The persistently high prevalence of diabetes in Karanganyar Regency, along with the interaction among multiple determinants, underlies the objective of this study, which is to analyze the influence of structural, cognitive, and relational social capital models on tertiary preventive behavior among elderly individuals with Type 2 Diabetes Mellitus.
Subjects and Method: This study employed a cross-sectional design. It was conducted in Karanganyar Regency (Jatipuro, Jatiyoso, and Karanganyar sub-districts), Central Java, from January to March 2025. A total of 210 elderly participants were selected using certified random sampling. Data were collected using a structured questionnaire. The analyses included univariate, bivariate, and multivariate analyses using a structural equation model (SEM). The dependent variable was tertiary preventive behavior among elderly individuals with Type 2 Diabetes Mellitus. The independent variables were social capital, comprising structural social capital, cognitive social capital, and relational social capital.
Results: Structural social capital had a positive and statistically significant effect on tertiary preventive behavior (b= 0.32; 95% CI= 0.13 to 0.52; p= 0.001). Relational social capital also showed a positive and significant effect on tertiary preventive behavior (b= 0.37; 95% CI= 0.15 to 0.59; p= 0.001). Age demonstrated a negative and statistically significant effect on tertiary preventive behavior (b= -0.09; 95% CI= -0.16 to -0.03; p= 0.003).
Conclusion: The findings of this study indicate that elderly individuals with Type 2 Diabetes Mellitus who have higher levels of social capital—comprising structural, cognitive, and relational dimensions—are more likely to engage in tertiary preventive behaviors.

Keywords: structural equation model, elderly, type 2 diabetes mellitus

Correspondence:
Bhisma Murti. Master's Program in Public Health, Universitas Sebelas Maret. Jl. Ir. Sutami 36A, Surakarta 57126, Central Java, Indonesia. Email: bhisma.murti@gmail.com.

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BACKGROUND

Diabetes Mellitus (DM), known as the "silent killer," continues to show an increasing number of cases. It has emerged as one of the most serious and common chronic diseases, leading to life-threatening complications, disability, and reduced life expectancy. The International Diabetes Federation (IDF) reported that the global prevalence of diabetes among individuals aged 20 to 79 years was 10.5% (536.6 million people) in 2021 and is projected to rise to 12.2% (783.2 million) by 2045. The prevalence is similar between men and women and is highest among those aged 75 to 79 years. In 2021, the prevalence was higher in urban areas (12.1%) than in rural areas (8.3%), and in high-income countries (11.1%) compared to low-income countries (5.5%) (IDF, 2022).

Data from the Indonesian Health Research (Riskesdas, 2018) showed that the prevalence of diabetes in Indonesia increased from 1.5% in 2013 to 2.0% in 2018. Central Java ranked 12th, with an increase in prevalence from 1.6% in 2013 to 2.1% in 2018 (Ministry of Health Republic Indonesia, 2022). Based on the Karanganyar District Health Profile Report (2022), there were 15,571 cases of diabetes mellitus, which increased to 17,141 cases in 2023. These figures include patients who visited primary healthcare centers and other healthcare facilities.

Tertiary preventive behavior refers to preventive actions undertaken in the advanced stage after a disease or disorder has occurred, aiming to improve health conditions, restore function, and prevent more severe complications (Notoatmodjo, 2012). Social capital is considered an important element influencing individuals' perceptions of tertiary preventive behavior. It also affects self-perception regarding the control of diabetes-related complications (Oliveira, 2018). Social capital is categorized into three key dimensions: structural, relational, and cognitive (Heru, 2017).

Recent studies over the past five years have highlighted that social capital, particularly social support from family, friends, and the community, is positively associated with self-management practices among patients with diabetes. Wang et al. (2024) reported that structural social capital significantly increased physical activity and health check-up behaviors among the elderly, although it reduced the likelihood of smoking cessation behavior. Cognitive social capital increased the likelihood of adequate sleep and physical activity among older adults. This finding is supported by Syafei (2019), who reported that self-care management in patients with Type 2 DM was influenced by social support (24.9%), patient education (13.3%), nutritional literacy (7.9%), and self-efficacy (8.2%). Furthermore, Werfalli et al. (2020) found that elderly individuals receiving more intensive social support were more adherent to dietary recommendations, physical activity, and self-care practices such as foot care and blood glucose monitoring. Such support facilitates better understanding of health information and adherence to medication schedules, thereby indirectly contributing to improved glycemic control.

Among the elderly, social capital becomes increasingly crucial as the aging process leads to declines in physical function, cognitive capacity, and social roles. Elderly individuals with Type 2 Diabetes Mellitus face additional challenges, including complex self-management demands, higher risks of complications, and greater psychological burden compared to those without chronic conditions. Therefore, social capital serves as a protective mechanism that enhances the ability of elderly individuals to adapt to these conditions. Given the high

prevalence of diabetes mellitus in Karanganyar Regency and the interaction among its determinants, this study aims to examine the influence of social capital on tertiary preventive behavior among elderly individuals with Type 2 Diabetes Mellitus using a structural equation model. The independent variables include social capital (structural, cognitive, and relational dimensions), while the dependent variable is tertiary preventive behavior.

SUBJECTS AND METHOD

1. Study Design

This study employed an analytic observational design with a cross-sectional approach. It was conducted at elderly integrated health service posts (Posyandu Lansia) in Karanganyar Regency, covering the working areas of Jatipuro, Jatiyoso, and Karanganyar sub-districts. The study was carried out from January to March 2025.

2. Population and Sample

The population in this study is elderly individuals with Type 2 Diabetes Mellitus at elderly integrated health service posts (Posyandu Lansia) in the working areas of Jatipuro, Jatiyoso, and Karanganyar sub-districts. This study sample used 210 elderly individuals who were selected using stratified random sampling with a non-proportional approach, in which the population was divided into several strata based on geographic areas and an equal number of samples was randomly selected from each stratum.

3. Study Variables

The dependent variable in this study is tertiary preventive behavior. The independent variables are social capital, which include structural social capital, cognitive social capital, and relation social capital.

4. Definition of Variables

Tertiary preventive behavior is defined as preventive actions undertaken after the disease has occurred, aimed at preventing disability, avoiding further complications, reducing the impact of the disease, and improving quality of life.

Structural social capital is defined as the level of elderly participation in social networks, measured by the frequency of participation, membership, and interaction within social organizations that support health maintenance and diabetes management (Claridge, 2018).

Cognitive social capital is defined as the level of elderly individuals' perceptions of trust, mutual support, care, and social norms within family, neighbors, and the community that facilitate diabetes self-management behaviors (Claridge, 2018).

Relation social capital is defined as the quality of relationships between elderly individuals and family members, neighbors, friends, and healthcare providers, characterized by personal trust, emotional support, and a sense of security in interactions that support diabetes management (Claridge, 2018).

5. Study Instruments

The instrument used for data collection was a questionnaire developed by the researcher based on existing theories and had undergone validity and reliability testing. The structural social capital construct consisted of 5 items, cognitive social capital consisted of 4 items, relational social capital consisted of 5 items, and tertiary preventive behavior consisted of 6 items.

6. Analysis Data

Univariate analysis was used to obtain the frequency distribution and percentage of the study subjects' characteristics. Bivariate analysis was conducted to examine the association between independent and dependent variables, while multivariate analysis was performed using a structural equation model (SEM). This study analyzed the influence of social capital, including struc-

tural social capital, cognitive social capital, and relational social capital, on tertiary preventive behavior among elderly individuals with Type 2 Diabetes Mellitus. Data analysis was conducted using STATA.

7. Research Ethics

Ethical considerations, including informed consent, anonymity, and confidentiality, were carefully addressed throughout the study. Ethical approval was obtained from the Faculty of Medicine, Universitas Islam Al-Azhar on January 13, 2025, with approval number 004/EC-02/FK-06/UNIZAR/I/2025.

RESULTS

1. Univariate Analysis

Univariate analysis was conducted to provide an overview of the demographic characteristics of the respondents. Based on Table 1, a total of 210 respondents were included in this study. The gender distribution showed that 144 respondents (68.57%) were female, while 66 respondents (31.43%) were male. This indicates that female participants were more represented in this study than male participants.

Table 1. Distribution of Respondents' Gender Characteristics

Variabel	Category	Frequency (n)	Percentage (%)
Gender	Male	66	31.43
	Female	144	68.57

Based on Table 2, the mean age of the respondents was 68.27 years with a standard deviation of 5.43, indicating that most respondents were in the elderly category, with an age range of 61 to 83 years. Furthermore, the social capital variables showed relatively homogeneous values. Structural social capital had a mean of 8.77 with a standard deviation of 1.82, ranging from 5 to 10, while cognitive social capital had a mean of 6.48 with a standard deviation of 1.18, ranging from 3 to 8. In addition, relational social capital had a mean of 6.66 with a standard deviation of 1.24, with minimum and maximum scores of 4 and 10, respectively, indicating that the quality of respondents' social relationships was at a relatively good level. Meanwhile, tertiary preventive behavior had a mean score of 6.89 with a standard deviation of 2.63, ranging from 1 to 12, suggesting greater variability compared to the other variables.

Table 2. Distribution of Age, Structural Social Capital, Cognitive Social Capital, Relational Social Capital, and Tertiary Preventive Behavior

Variable	Mean	SD	Minimum	Maximum
Age	68.27	5.43	61	83
Structural Element	8.77	1.82	5	10
Cognitive Element	6.48	1.18	3	8
Relational Element	6.66	1.24	4	10
Tertiary Preventive Behavior	6.89	2.63	1	12

2. Bivariate Analysis

Table 3 presents the path analysis results to examine the effects of structural social capital, relational social capital, and age on tertiary preventive behavior among elderly individuals with Type 2 Diabetes Mellitus.

Interpretation was based on the path coe¬fficient (b), 95% confidence interval (95% CI), and p-value.

Structural social capital had a positive and statistically significant effect on tertiary preventive behavior (b= 0.32; 95% CI= 0.13 to 0.52; p= 0.001). Relational social capital also showed a positive and significant effect on tertiary preventive behavior (b= 0.37; 95% CI= 0.15 to 0.59; p= 0.001). Age demonstrated a negative and statistically significant effect on tertiary preventive behavior (b= -0.09; 95% CI= -0.16 to -0.03; p= 0.003). This indicates that increasing age is associated with a lower likelihood of engaging in tertiary preventive behaviors.

Table 3. Results of Bivariate Analysis of the Effects of Social Capital, Gender, and Age on Tertiary Preventive Behavior among Elderly with Type 2 Diabetes Mellitus

Variable	Path Coefficient (b)	CI 95%		p
		Lower Limit	Upper Limit	
Structural Element	0.32	0.13	0.52	0.001
Relational Elementl	0.37	0.15	0.59	0.001
Age	-0.09	-0.16	-0.03	0.003

3. Multivariate Analysis

Figure 1 presents the results of the structural equation model (SEM) examining the effect of social capital on tertiary preventive behavior among elderly individuals with Type 2 Diabetes Mellitus. The figure shows that social capital is constructed from three main components: structural social capital, cognitive social capital, and relational social capital.

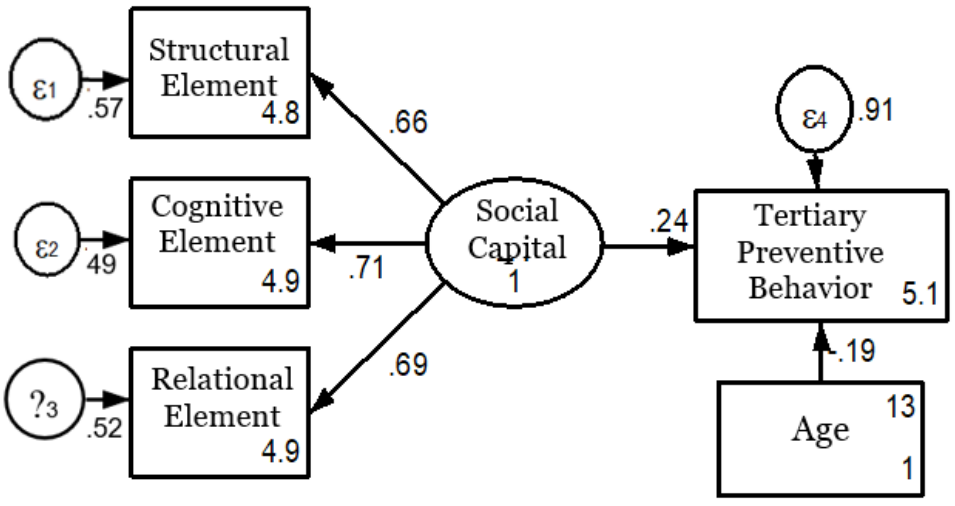

Figure 1. Structural Equation Model (SEM) of the Effect of Social Capital on Tertiary Preventive Behavior among Elderly with Type 2 Diabetes Mellitus

Figure 1 presents the results of the structural equation model (SEM) examining the effect of social capital on tertiary preventive behavior among elderly individuals with Type 2 Diabetes Mellitus. The measurement components in the path

analysis indicate that structural, cognitive, and relational social capital have positive factor loadings on the latent variable of social capital. Social capital has a positive direct effect on tertiary preventive behavior.

Based on Table 4, structural social capital made a substantial and statistically significant contribution to the formation of the social capital construct (b= 0.66; 95% CI= 0.54 to 0.77; p<0.001). Cognitive social capital also showed a substantial and statistically significant contribution to the social capital construct, with a stronger effect than structural social capital. Shared values, perspectives, and life goals determine the level of social capital (b= 0.71; 95% CI= 0.60 to 0.82; p<0.001). Relational social capital similarly contributed substantially and significantly to the social capital construct (b= 0.69; 95% CI= 0.57 to 0.80; p<0.001).

Overall, social capital had a substantial and statistically significant effect on tertiary preventive behavior. Higher levels of social capital among the elderly were associated with better engagement in tertiary prevention practices for Type 2 Diabetes Mellitus, such as regular medical check-ups, healthy lifestyle management, and adherence to treatment (b= 0.24; 95% CI= 0.08 to 0.38; p= 0.002). Age showed a negative and statistically significant effect on tertiary preventive behavior, indicating that increasing age is associated with a lower likelihood of engaging in such behaviors (b= -0.19; 95% CI= -0.32 to -0.68; p= 0.003).

Table 4 also demonstrated a good model fit, with the following indices: p= 0.062, RMSEA= 0.073, CFI= 0.962, TLI= 0.925, and SRMR= 0.038. These results indicate that the proposed model fits the observed data .

Table 4. Results of Structural Equation Model (SEM) Analysis on the Effect of Social Capital on Tertiary Preventive Behavior among Elderly with Type 2 DM

Dependent Variable	Independent Variable	Path coefficient (b)	95% CI		p
			Lower limit	Upper Limit	
Measurement Model					
Social Capital	← Structural	0.66	0.54	0.77	<0.001
	← Cognitive	0.71	0.60	0.82	<0.001
	← Relational	0.69	0.57	0.80	<0.001
Structural Model					
Tertiary Preventive Behavior	← Social Capital	0.24	0.08	0.38	0.002
	← Age	-0.19	-0.32	-0.68	0.003
n observation = 210					
Goodness of Fit Indices:					
p=0.062 (p>0.05), RMSEA= 0.073 (<0.08), CFI = 0.96 (≥0.09), TLI=0.92 (≥0.90), SRMR=0.038 (<0.08), Coefficient of Determination (CD) = 0.74					

DISCUSSION

Relationship between Structural Social Capital and Social Capital

Structural social capital showed a positive and statistically significant effect on the formation of the social capital construct. The coefficient value of 0.66 indicates that structural aspects such as participation in organizations, formal social networks, and community involvement make a substantial contribution to overall social capital.

These findings suggest that structural social capital plays an important role in strengthening the overall social capital construct. Elements such as participation in formal organizations, engagement in community activities, and structured social networks contribute meaningfully to enhancing social capital. Structural social capital can be viewed as a medium that enables individuals to build and maintain productive social relationships (Weiler et al., 2024). Similarly, Islam and Walk (2020) reported that involvement in formal organizations and social networks significantly contributes to increased social cohesion and collaborative behavior. Their study found that communities with strong structural social networks have greater capacity to resolve social conflicts and foster solidarity.

Furthermore, research by Pitas and Ehmer (2020) during the COVID-19 pandemic highlighted the important role of social structures such as community groups and local organizations in maintaining collective well-being. They concluded that strong social structures can enhance social resilience during times of crisis.

Relationship between Cognitive Social Capital and Social Capital

In this study, it was found that cognitive social capital has a positive and significant effect on social capital among elderly individuals with Type 2 Diabetes Mellitus. The coefficient value indicates that cognitive aspects such as interpersonal trust, perceived fairness, and shared social values play a dominant role in shaping social capital.

Kouvonen et al. (2021) stated that interpersonal trust and perceived social support are closely related to quality of life and treatment adherence among elderly individuals with chronic diseases. When older adults feel trusted and are able to trust their social environment, they tend to have better psychological well-being and are more likely to engage in positive health behaviors.

Shared values and perceptions of fairness also play an important role in strengthening social capital. Gao et al. (2020) found that these factors increase a sense of belonging to the community and contribute to stronger social cohesion among the elderly population. This indicates that cognitive social capital not only influences individual perceptions but also enhances collective relationships within the community.

In addition, Lazar et al. (2020) highlighted that cognitive aspects are important in improving social resilience among older adults. In the context of Type 2 Diabetes Mellitus, when elderly individuals perceive that their environment is supportive and fair, they are more motivated to maintain their health and actively participate in social activities. Rahmawati et al. (2023) also emphasized that the psychological dimension of social capital supports adaptive behavior and self-acceptance among elderly individuals with chronic diseases. Therefore, strengthening cognitive social capital through building trust, reinforcing shared values, and improving perceptions of fairness is essential to enhance social capital and support better health behavior among the elderly.

Relationship between Relational Social Capital and Social Capital

In this study, it was found that relational social capital has a positive and significant effect on the social capital construct among elderly individuals with Type 2 Diabetes Mellitus. Relational social capital reflects the quality of interpersonal relationships formed through continuous interaction and shared social experiences. These relationships create a supportive environment in

which elderly individuals feel safe, accepted, and valued, thereby strengthening overall social capital, especially among those living with chronic conditions such as Type 2 Diabetes Mellitus.

Farina et al. (2020) stated that warm and supportive interpersonal relationships among the elderly are positively associated with better mental health and quality of life. In this context, trust and reciprocity function not only as social bonding elements but also enhance individuals' sense of security and belonging within the community.

Claridge (2018) emphasized that relational social capital represents a core dimension of social capital, as it reflects the quality of relationships between individuals. These relationships are built through ongoing interactions and shared experiences, creating a social climate that encourages elderly individuals to engage in social activities and receive emotional support.

In Indonesia, Setyawati et al. (2022) found that norms of mutual assistance and high interpersonal trust are closely related to the sustainability of elderly community health posts and community-based social activities. Reciprocity also plays a key role in encouraging active participation and strengthening social cohesion. Furthermore, Kurniawan and Dewi (2023) reported that elderly individuals who have meaningful social relationships and feel supported by their social environment demonstrate higher treatment adherence and greater life satisfaction. Relational social capital also helps reduce feelings of isolation, which are commonly experienced by elderly individuals with chronic conditions.

Relationship between Social Capital and Tertiary Preventive Behavior

In this study, it was found that social capital has a positive and significant effect on tertiary preventive behavior among elderly individuals with Type 2 Diabetes Mellitus. Higher levels of social capital—whether structural, cognitive, or relational—are associated with better engagement in preventing complications, such as routine medical check-ups, healthy lifestyle management, and adherence to treatment.

Although the magnitude of the effect is moderate, its statistical significance highlights that social capital remains an important factor in encouraging elderly individuals to engage in preventive actions for Type 2 Diabetes Mellitus complications. These include regular medical examinations, treatment adherence, and maintaining a healthy lifestyle.

Jian et al. (2026) stated that elderly individuals with strong social networks and perceived social support are more likely to actively manage chronic diseases, including attending regular check-ups and maintaining dietary patterns. Strong social capital provides emotional support, access to information, and motivation needed to sustain healthy behaviors.

Yamada et al. (2019) also reported that social capital, particularly in the form of social trust and reciprocity, is associated with improved treatment adherence among patients with chronic diseases. When elderly individuals feel socially connected and trust their surrounding environment, they are more motivated to maintain their health and follow medical recommendations.

Furthermore, Chen et al. (2020) found that communities with high levels of social capital create supportive environments for sharing health information, promoting collective healthy behaviors, and helping individuals overcome barriers to preventive actions. In the context of elderly individuals with Type 2 Diabetes Mellitus, social capital enables support from peers and family members, encouraging them to remain consistent in health monitoring and healthy lifestyle practices.

Relationship between Age and Tertiary Preventive Behavior

The negative path coefficient indicates that increasing age is associated with a lower likelihood of engaging in tertiary preventive behaviors. This finding suggests that age is a significant limiting factor in elderly individuals' participation in activities aimed at preventing complications of type 2 DM, such as routine medical check-ups, treatment adherence, and healthy lifestyle management.This decline can be explained by several factors. Chen et al. (2020) found that age-related declines in physical and cognitive function may hinder elderly individuals' ability to maintain healthcare routines, particularly in managing chronic diseases. These barriers include limitations in mobility, memory, and reduced motivation to undergo regular health monitoring.

Lee et al. (2021) also reported that older elderly individuals tend to experience limited access to healthcare services due to geographic barriers, transportation constraints, and lack of family support. This results in reduced participation in preventive actions, even when they are aware of the importance of disease management. In the Indonesian context, Nurhasanah and Sulastri (2022) found that older elderly individuals tend to be more passive and have less initiative in seeking healthcare services or participating in health promotion activities. This may be related to the perception that illness is a natural part of aging or to fatigue from long-term treatment routines.

Furthermore, Nguyen et al. (2020) reported that self-efficacy tends to decline with age, leading elderly individuals to feel less capable of consistently performing preventive behaviors. This condition may be exacerbated in the absence of strong social support systems.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

REFERENCES

American Diabetes Association. (2023). Standards of medical care in diabetes 2023. Diabetes Care. 46(Suppl 1): S1–S291. doi: 10.2337/dc23-SINT.

Chen YM, Lin HS, Lin PY. (2017). Self-care behaviors of older people with chronic disease: a longitudinal study. J Nurs Res. 25(5): 368–375. doi: 10.1097/jnr.0000000000000189.

Claridge T. (2018). Dimensions of social capital: structural, cognitive, and relational. Soc Cap Res. 1: 1–4.

Farina E, Riva M, Pruneri F, Malnati M. (2020). Social support and quality of life in older adults: the role of interpersonal relationships. Aging Ment Health. 24(10): 1653–1660. doi: 10.1080/13607863.2019.1622620.

Gao M, Wang C, Sun X. (2020). Social capital and health in older adults: a systematic review and meta-analysis. Arch Gerontol Geriatr. 91: 104236. doi: 10.1016/j.archger.2020.104236.

Ghozali I. (2016). Aplikasi analisis multivariate dengan program IBM SPSS 23. Badan Penerbit Universitas Diponegoro.

Hair JF, Black WC, Babin BJ, Anderson RE. (2014). Multivariate data analysis. 7th ed. Pearson Education.

International Diabetes Federation. (2022). IDF diabetes atlas: global, regional and country-level diabetes prevalence

estimates for 2021 and projections for 2045. Diabetes Res Clin Pract. 183: 109119. doi: 10.1016/j.diabres.2021.109119.

Islam MR, Walk M. (2020). Community social capital and individual social capital: a study on their interrelationship and roles in disaster recovery. Int J Disaster Risk Reduct. 50: 101735. doi: 10.1016/j.ijdrr.2020.101735.

Jian C, Peng X, Tian H, Ding Q (2026). The influence of social support on active aging in chronic disease patients among older adults: mediating role of coping strategies. Front Public Health. 14:1747285. https://doi.org/10.3389/fpubh.2026.1747285.

Kementerian Kesehatan Republik Indonesia. (2018). Laporan nasional riset kesehatan dasar (Riskesdas) tahun 2018. Badan Penelitian dan Pengembangan Kesehatan.

Kouvonen A, Vahtera J, Oksanen T, De Vogli R, et al. (2021). Chronic disease, social capital, and health-related quality of life among older adults. J Aging Health. 33(1–2): 3–15. doi: 10.1177/0898264320931900.

Kurniawan H, Dewi SR. (2023). Modal sosial dan kepatuhan pengobatan lansia dengan penyakit kronis di wilayah perkotaan. J Geriatri Indones. 7(1): 20–29.

Lazar A, Fingerman KL, Luo M. (2020). Perceived fairness, trust, and social engagement among older adults: implications for community health. Gerontologist. 60(6): 1092–1101. doi: 10.1093/geront/gnaa048.

Lee HY, Jang SN, Lee SA. (2021). Barriers to health care access and utilization among older adults: a cross-national study. Int J Environ Res Public Health. 18(2): 689. doi: 10.3390/\ijerph18020689.

Murti B. (2013). Prinsip dan metode riset epidemiologi. Gadjah Mada University Press.

Nguyen HT, Pham T, Vu LH. (2020). Self-efficacy and health behaviors among the elderly with chronic diseases. BMC Geriatr. 20: 256. doi: 10.1186/s12877-020-01626-w.

Notoatmodjo S. (2012). Promosi kesehatan dan perilaku kesehatan. Rineka Cipta.

Nurhasanah I, Sulastri F. (2022). Perilaku preventif lansia terhadap penyakit kronis ditinjau dari usia dan dukungan sosial. J Keperawatan Kesehat Masy. 11(2): 85–92.

Oliveira CDL. (2018). What is the association between social capital and diabetes mellitus? a systematic review. Diabetes Metab Syndr Clin Res Rev. 12(4): 601–605. doi: 10.1016/j.dsx.2018.03.021.

Perkins DD, Brown BB, Taylor RB. (2021). Social networks, neighborhood structures, and community engagement. Community Dev J.

Pitas N, Ehmer C. (2020). Social capital in the response to COVID-19. Am J Health Promot. 34(5): 527–529. doi: 10.1177/0890117120924531.

Rahmawati I, Setiawan R, Kurniasih D. (2023). Modal sosial kognitif dan penerimaan diri lansia penderita penyakit kronis. J Keperawatan Kesehat Masy. 12(1): 14–23.

Setyawati R, Hidayati R, Mahendra A. (2022). Pengaruh modal sosial terhadap partisipasi lansia dalam kegiatan komunitas: studi pada kelompok posyandu lansia. J Sos Humaniora Terap. 4(2): 112–124.

Syafei A, Darmaja S. (2019). Determinan manajemen perawatan diri pasien diabetes melitus tipe 2 di puskesmas Keca-

matan Ciputat, Kota Tangerang Selatan. J Penelit Pengemb Pelayanan Kesehat. 3(2): 73–85.

Wang Z, Fang Y, Zhang X. (2024). Impact of social capital on health behaviors of middle-aged and older adults in China: an analysis based on CHARLS 2020 data. Healthcare (Basel). 12(11): 1154. doi: 10.3390/healthcare121111-54.