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Association of Age, Gender, Educational Level, and Duration of Illness with Coping Mechanisms among Patients with Type 2 Diabetes Mellitus

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Abstract

Studies showed that diabetes-related distress and coping are influenced by sociodemographic and illness-related factors. This study examined the associations of age, gender, educational level, and duration of illness with coping mechanisms among patients with T2DM. This quantitative analytic study used a cross-sectional design and was conducted at Singandaru Public Health Center, Serang City from April to May 2023. A total of 30 respondents were recruited using total sampling. Data were collected using a 20-item coping-mechanism questionnaire scored on a Likert scale. Univariate analysis was used to describe respondent characteristics, bivariate analysis to assess associations between independent variables and coping mechanisms, and multivariate analysis to identify the most dominant factor. Most respondents were 46-55 years old (63.3%), female (53.3%), had junior high school education (43.3%), had been living with diabetes for 2 years (43.3%), and demonstrated adaptive coping mechanisms (80.0%). Bivariate analysis showed significant associations between coping mechanisms and age ($p < .001$), gender ($p = .044$), educational level ($p = .001$), and duration of illness ($p = .032$). In the multivariate model, age remained the most dominant factor ($B = -0.693$, $p = .023$). Age, gender, educational level, and duration of illness were significantly associated with coping mechanisms among patients with T2DM, with age emerging as the strongest predictor. These findings highlight the need for primary-care interventions that integrate psychosocial assessment, tailored education, and emotional support.
Keywords: age, coping mechanisms, diabetes mellitus, duration of illness, educational level

Hubungan Usia, Jenis Kelamin, Tingkat Pendidikan, dan Durasi Penyakit dengan Mekanisme Koping pada Pasien Diabetes Melitus Tipe 2

Abstrak

Penelitian terdahulu menunjukkan bahwa tekanan akibat diabetes dan mekanisme koping dipengaruhi oleh faktor sosiodemografis dan terkait penyakit. Penelitian ini mengidentifikasi hubungan usia, jenis kelamin, tingkat pendidikan, dan durasi penyakit dengan mekanisme koping pada pasien DMT2. Studi analitik kuantitatif ini menggunakan desain potong lintang dan dilakukan di Puskesmas Singandaru, Kota Serang pada bulan April hingga Mei 2023. Sebanyak 30 responden dipilih dengan menggunakan teknik total sampling. Data dikumpulkan dengan menggunakan kuesioner mekanisme koping 20 item yang dinilai pada skala Likert. Analisis univariat digunakan untuk menggambarkan karakteristik responden, analisis bivariat untuk menilai asosiasi antara variabel independen dan mekanisme koping, dan analisis multivariat untuk mengidentifikasi faktor yang paling dominan. Sebagian besar responden berusia 46-55 tahun (63,3%), perempuan (53,3%), memiliki pendidikan SMP (43,3%), telah hidup dengan diabetes selama 2 tahun (43,3%), dan menunjukkan mekanisme koping adaptif (80,0%). Analisis bivariat menunjukkan hubungan yang signifikan antara mekanisme koping dan usia ($p < 0,001$), jenis kelamin ($p = 0,044$), tingkat pendidikan ($p = 0,001$), dan durasi penyakit ($p = 0,032$). Dalam model multivariat, usia tetap menjadi faktor paling dominan ($B = -0,693$, $p = 0,023$). Usia, jenis kelamin, tingkat pendidikan, dan durasi penyakit secara signifikan dikaitkan dengan mekanisme koping pada pasien DMT2, dengan usia muncul sebagai prediktor terkuat. Temuan ini menyoroti perlunya intervensi perawatan primer yang mengintegrasikan penilaian psikososial, pendidikan yang disesuaikan, dan dukungan emosional.
Kata Kunci: *diabetes melitus, durasi penyakit, mekanisme koping, tingkat Pendidikan, usia*

Introduction

Type 2 diabetes mellitus is a chronic disease that requires long-term adaptation because effective disease control depends not only on pharmacological treatment but also on sustained lifestyle change, self-monitoring, regular use of health services, and active patient participation in daily self-care. These ongoing demands can create psychological strain, especially when patients must manage treatment routines, fear of complications, and the lifelong burden of glycemic control (Captieux et al., 2018; Zu et al., 2024).

Within the context of chronic illness, coping mechanisms are central to the ways individuals appraise health threats, regulate emotional responses, make decisions, and maintain self-care behaviors. Adaptive coping can support acceptance of the diagnosis, improve help-seeking behavior, strengthen treatment adherence, and preserve quality of life. In contrast, maladaptive coping may intensify emotional distress, undermine adherence, and interfere with effective disease management (Freeman-Hildreth et al., 2019; McCoy & Theeke, 2019).

A growing body of evidence shows that diabetes-related distress and coping are influenced by sociodemographic and illness-related factors. Several studies have reported that age, educational attainment, and duration of diabetes are associated with how patients experience diabetes-related stress, although the direction and strength of these relationships may vary across settings and populations (Aljuaid et al., 2018; Bhaskara et al., 2022; German et al., 2023; Huynh et al., 2021). Gender differences have also been described, particularly in emotional expression, social support utilization, and perceived burden of self-management (Chew et al., 2016; McCoy & Theeke, 2019).

The present study was conceptually informed by the Common-Sense Model of Self-Regulation, which proposes that individuals form cognitive and emotional representations of illness and then respond through coping efforts and self-management behaviors (Hagger & Orbell, 2022; Leventhal et al., 2016). From this perspective, personal characteristics such as age, gender, educational level, and duration of illness may influence how patients interpret diabetes and which coping strategies they adopt in daily life. This study aimed to analyze the associations of age, gender, educational level, and duration of illness with coping mechanisms among patients with type 2 diabetes mellitus in Puskesmas Singandaru, Serang City.

Methods

This study employed a quantitative analytic design with a cross-sectional approach. The research was conducted in the Puskesmas Singandaru, Serang City, from April to May 2023.

The study population comprised all patients with type 2 diabetes mellitus who visited the health center during the study period. The sample was determined using total sampling, and 30 respondents who met the inclusion criteria were enrolled in the study.

Data were collected using a 20-item coping-mechanism questionnaire scored on a Likert scale. The independent variables were age, gender, educational level, and duration of illness, whereas the dependent variable was coping mechanism, categorized as adaptive or maladaptive according to the total questionnaire score. Because the original dataset did not report detailed psychometric statistics for the instrument, the results should be interpreted with caution.

Data analysis was conducted in three stages. Univariate analysis was used to describe respondent characteristics and the distribution of coping mechanisms. Bivariate analysis was performed to assess the associations between each independent variable and coping mechanisms. Multivariate analysis was then conducted to identify the most dominant factor associated with coping mechanisms. Statistical significance was set at $p < .05$.

This study received ethical approval from the Research Ethics Committee of Faletehan University under reference number 287/KEPK.UF/VI/2023.

Result and Discussion

The characteristics of respondents and the distribution of coping mechanisms are presented in Table 1.

Table 1. Characteristics of Respondents and Coping Mechanisms (n=30)

Variabel	n	%
Age		
46-55 years	19	63.3
56-65 years	7	23.3

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>65 years	4	13.3
Gender		
Male	14	46.7
Female	16	53.3
Educational level		
Elementary school	4	13.3
Junior high school	13	43.3
Senior high school	10	33.3
College/university	3	10.0
Duration of illness		
2 years	13	43.3
3 years	8	26.7
4 years	2	6.7
5 years	6	20.0
>=6 years	1	3.3
Coping mechanism		
Adaptive	24	80.0
Maladaptive	6	20.0

Most respondents were 46-55 years old, female, had junior high school education, and demonstrated adaptive coping mechanisms. This distribution suggests that the sample was dominated by middle-aged adults who had been living with diabetes long enough to develop relatively constructive responses to illness-related stress. Although descriptive findings alone cannot explain coping patterns, they provide an important context for interpreting the inferential analysis.

Table 2. Bivariate Associations Between Respondent Characteristics and Coping Mechanisms

Variabel	p value	Interpretation
Age	< .001	Significant
Gender	.044	Significant
Educational level	.001	Significant
Duration of illness	.032	Significant

Table 2 shows that age, gender, educational level, and duration of illness were significantly associated with coping mechanisms. These findings are broadly consistent with the literature indicating that coping in T2DM is shaped by both demographic factors and the lived experience of disease management, although prior studies have also shown that these associations may differ according to context, population characteristics, and the way distress or coping is measured (Aljuaid et al., 2018; Bhaskara et al., 2022; German et al., 2023).

Age was significantly associated with coping mechanisms and remained the most influential factor in the multivariate model. This result may reflect differences in emotional maturity, life experience, role expectations, and adaptation to chronic illness. Older adults may have had more time to adjust to long-term treatment demands, whereas younger or middle-aged adults may experience greater disruption of employment, family responsibilities, and future plans, which can influence the way they cope with diabetes-related stress (Huynh et al., 2021; McCoy & Theeke, 2019).

Gender was also associated with coping mechanisms. Gender-related differences in coping may arise from variation in emotional expression, help-seeking behavior, caregiving roles, and access to social support. Women often report the emotional burden of chronic illness more openly, while men may be less likely to disclose vulnerability or seek support, and these differences can shape the coping profiles observed in clinical settings (Chew et al., 2016; McCoy & Theeke, 2019).

Educational level showed a significant relationship with coping mechanisms in the bivariate analysis. Education may enhance health literacy, improve understanding of symptoms and treatment, and support more effective problem solving. Patients with higher educational attainment may therefore be better positioned to appraise disease-related challenges and adopt more adaptive coping responses (Arifin et al., 2019; Captieux et al., 2018).

Table 3. Multivariate Analysis of Factors Associated with Coping Mechanisms

Variabel	Coefficient (B)	p value
Age	-0.693	.023
Educational level	-0.327	.052
Duration of illness	0.150	.599
Gender	0.036	.833

In the multivariate model, age remained the only statistically significant factor. This finding suggests that age may capture broader differences in illness appraisal, psychological adaptation, and social role demands that are not fully explained by the other variables. However, the multivariate

results should be interpreted cautiously because the sample was small, several categories contained few respondents, and the model may have been underpowered to detect independent effects of education, duration of illness, and gender.

Duration of illness was significantly associated with coping in the bivariate analysis but not in the final model. Living longer with diabetes may expose patients to both cumulative stressors and opportunities for adaptation. On one hand, prolonged illness can contribute to treatment fatigue and fear of complications; on the other hand, experience with disease management may foster resilience and more stable coping strategies (Perrin et al., 2019; Zu et al., 2024). The loss of significance in the multivariate model may therefore reflect the small sample rather than the absence of a clinically meaningful relationship.

Overall, the findings indicate that coping mechanisms among patients with T2DM are influenced not only by clinical circumstances but also by personal and social characteristics. The results support the importance of primary-care nursing interventions that include psychosocial assessment, tailored education, and emotional support. Strengthening adaptive coping may improve treatment engagement and long-term self-management, particularly among patients who are younger, have limited educational attainment, or are still adjusting to the demands of chronic illness (Freeman-Hildreth et al., 2019; Hagger & Orbell, 2022).

This study has several limitations. The sample size was relatively small and was drawn from a single primary-care setting, which limits generalizability. In addition, the psychometric properties of the coping questionnaire were not reported in detail, and several variable categories contained small cell counts, which may reduce the stability of the multivariate estimates. Future studies should use larger samples, validated instruments, and broader clinical settings to confirm these findings.

Conclusion

Most patients with type 2 diabetes mellitus in Puskesmas Singandari, Serang City demonstrated adaptive coping mechanisms. Age, gender, educational level, and duration of illness were significantly associated with coping mechanisms in the bivariate analysis, and age was identified as the most dominant factor in the multivariate model. These findings underscore the need for nursing care that integrates psychosocial assessment and individualized educational support to strengthen adaptive coping in patients living with chronic illness.

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