Stress, Ineffective Coping, and Anxiety in Productive-Age Diabetes Mellitus Patients: Implications for Mental Health Diagnosis

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ABSTRACT
Diabetes mellitus cases increased significantly in the 15-54 age group, according to doctors' diagnoses**.** Diabetes Mellitus in this age range causes a variety of risk factors that might lead to early symptoms of mental health disorders, such as irritability, anxiety, fatigue, and fear. The presence of early symptoms of mental health disorders can have a negative impact on the quality of life of productive-age people with Diabetes Mellitus, including decreased concentration and work productivity, a considerable deterioration in body function, and a drop in social functioning. This study aimed to explore and understand in-depth experiences of mental health disorders in the productive age group with Diabetes Mellitus. This study employed a phenomenological approach. Six participants (two men and four women) who had been diagnosed with Diabetes Mellitus by a doctor served as informants for the research. Data was collected through in-depth interviews, observations, and questionnaires. Data analysis was performed using thematic analysis with NVivo 12 software. The findings of this study reveal major mental health issues in the form of psychological symptoms (stress and anxiety) during Diabetes Mellitus diagnosis and treatment. In conclusion, people with diabetes mellitus in the productive age group exhibit significant symptoms of mental health issues such as stress, ineffective coping, and anxiety, which means that a diagnosis is required to ensure appropriate mental health interventions.
Keywords: productive age group; mental health issues; diabetes mellitus

INTRODUCTION
Diabetes mellitus is a chronic degenerative condition that continues to increase in Indonesia, with the number of diagnosed cases rising steadily each year. According to the Indonesian Health Survey, the proportion of doctor-diagnosed diabetes mellitus among individuals aged 15 years and older increased from 2.0% in 2018 to 2.2% in 2023 [1]. In the Special Region of Yogyakarta, 2.9% of the population had doctor-diagnosed diabetes mellitus [2]. A substantial rise occurred among individuals aged 15–54 years, with 501,397 cases reported placing the majority of patients within the productive age group [2]. Under the Manpower Law (Law No. 13/2003), Indonesian citizens aged 19–54 are classified as being in the productive age range and legally eligible to work.

The health status of the working-age population is essential for maintaining productivity and overall quality of life [3]. Individuals in productive age groups who suffer from degenerative diseases such as diabetes mellitus are more vulnerable to stress, which may progress into mental health problems [4]. Data from the 2023 Indonesian Health Survey show that 496,143 Indonesians aged 15–54 working as laborers, drivers, domestic helpers, self-employed workers, farmers, private employees, fishermen, civil servants, military personnel, police officers, and employees of state-owned enterprises reported experiencing depression within the previous two weeks [2]. Tambunan et al. (2024) [5] also reported that 419 government employees of productive age with diabetes mellitus experienced stress. Wen et al. (2023) [4] found that among 216 productive-aged diabetes mellitus patients, 43.52% experienced stress and 44.91% experienced depression.

Productive-aged individuals with diabetes mellitus are at heightened risk for mental health problems due to factors such as long-term treatment, treatment side effects, unhealthy lifestyle patterns, hormonal and metabolic instability, and insufficient family or environmental support [6]. Additional workplace-related risk factors include non-conducive work environments, excessive workload, job insecurity, and inadequate income (WHO, 2024) [7]. These factors may trigger early symptoms of mental health disturbances, including irritability, anxiety, fatigue, and fear [8]. Mental health is as important as physical health in determining quality of life, and early symptoms of mental health problems can significantly impair concentration, productivity, physical functioning, and social interaction among productive-aged individuals with diabetes mellitus [9].

Data from Sleman Regency indicate that the prevalence of diabetes mellitus among productive-aged individuals is approximately 11.3%, higher than the provincial prevalence of 3.1% and nearly equal to the national prevalence of 11.7% [10]. These figures highlight the need for special attention to diabetes mellitus management within the Depok II Sleman Community Health Center's working area [10]. Appropriate interventions; including efforts to prevent and manage mental health problems are essential for improving the quality of life of productive-aged individuals with diabetes mellitus.

Previous studies on mental health among diabetes mellitus patients have primarily focused on curative interventions, such as reducing anxiety through five-finger hypnosis relaxation therapy [11], Al-Qur'an murotal therapy [12], and educational interventions delivered in hospital settings [13]. Other studies have examined risk factors for diabetes mellitus among productive-aged individuals (15–60 years) [14], or explored depression and diabetes among American workers using Behavioral Risk Factor Surveillance System data [6]. However, no studies have specifically identified the types of mental health problems experienced by productive-aged individuals with diabetes mellitus.

Early symptoms of mental health problems in this population may be linked to low mental health awareness [4]. Many productive-aged individuals with diabetes mellitus focus primarily on meeting work demands and adhering to routine treatment, while overlooking the "silent killer" effects of work-related stress and treatment-related stress that occur simultaneously [15]. Over time, this silent burden may transform a productive individual with diabetes mellitus into an unproductive one with diminished quality of life. Therefore, mental health problems among productive-aged individuals with diabetes mellitus require immediate attention. Based on the issues described above, this study aims to explore the phenomenon of mental health problems experienced by productive-aged individuals with diabetes mellitus.

METHODS
This study was conducted from January to February 2026 in the working area of the Depok II Community Health Center (Puskesmas Depok II), Sleman Regency, Indonesia. Data collection took place in Ngringin Hamlet, one of the seven hamlets served by the health center. A qualitative approach with a phenomenological design was employed to explore the lived experiences of productive-age individuals with diabetes mellitus

regarding their mental health problems. This design was selected to obtain a holistic understanding of subjective symptoms and psychological challenges rooted in the participants' real-life experiences.

The study population consisted of 76 productive-age individuals with doctor-diagnosed diabetes mellitus residing in the Depok II Community Health Center service area. These individuals were distributed across seven hamlets: Kentungan (11), Dero (13), Ngringin (17), Manukan (7), Gempol (13), Joho (7), and Pik Gondang (8). Sampling was conducted in Ngringin Hamlet, which had the largest number of productive-age diabetes mellitus patients. Participants were selected purposively based on the study objectives. Inclusion criteria included: 1) being within the productive-age range (15–64 years) according to the Indonesian Central Bureau of Statistics and WHO; 2) having been diagnosed with diabetes mellitus by a physician for at least one to two years; 3) attending monthly check-ups at the Depok II Community Health Center. Sampling continued until no new information emerged and theoretical saturation was achieved. Cadres from Ngringin Hamlet assisted researchers in contacting eligible participants using data provided by the health center.

Data were collected using in-depth interviews and direct observations. Interviews were conducted face-to-face, beginning with an explanation of the study objectives and data confidentiality, followed by obtaining informed consent. Interviews were unstructured and flexible, lasting 60–90 minutes, and focused on participants' subjective experiences of mental health issues during diabetes treatment. All interviews were recorded using the researcher's smartphone (audio/video), and non-verbal cues, social interactions, and behavioral expressions were documented in a field notebook. Observational notes were used to complement interview data and enrich contextual understanding. After data collection, all recordings were transcribed verbatim. A member-check procedure was conducted by asking participants to review and confirm the accuracy of their transcripts.

Data analysis followed an iterative and interactive process consisting of five stages: transcription, coding and categorization, thematic analysis, interpretation, and conclusion drawing. NVivo 12 software was used to organize raw data and facilitate centralized coding. Initially, transcripts were validated through member checks. Coding was then performed by grouping similar codes into broader categories. Thematic analysis was used to identify patterns, hierarchies, and relationships among data, leading to the development of subthemes that describe specific dimensions of mental health problems experienced by productive-age individuals with diabetes mellitus. The final conclusions were derived to reflect the empirical reality captured through participants' narratives.

This study adhered to ethical standards for research involving human participants. Ethical approval was obtained from the Health Research Ethics Committee of Panti Rapih Hospital Yogyakarta. All participants provided informed consent prior to data collection, and confidentiality was maintained throughout the research process.

RESULTS

Table 2. Thematic analysis of interview results

Category	Main theme	Subtheme	Synthesis of findings	Quotation (verbatim)	Informant
Productive-age group with diabetes mellitus	Clinical condition	Disease history	Diabetes was detected at varying stages and often unnoticed	"free blood sugar check… over 300"	P1, P3
		Initial symptoms	Generally asymptomatic; symptoms appear when condition worsens	"no warning" "blood sugar reached 500"	P2, P4
		Blood sugar levels	Mostly fluctuating; some stable	"up and down" "highest was 145"	P1, P2
		Clinical status	Blood sugar frequently unstable	"often goes up and down"	P4, P1, P2, P3, P5, P6
	Causative factors	Lifestyle	Unhealthy eating and sleeping patterns	"love sweet foods" "irregular"	P1, P2
		Genetic	Strong family history	"it runs in the family"	P3, P5
		Psychological	Stress affects physical condition	"thoughts… high emotions"	P1, P4
	Disease management	Treatment	Oral medication & insulin; routine check-ups	"metformin… insulin"	P1, P2
		Adherence	Varying levels of adherence	"sometimes forget to take medicine"	P1, P6
		Lifestyle	Diet & exercise help control condition	"regular exercise" "jogging"	P2, P5
	Self-management	Self-awareness	Control depends on personal discipline	"must come from oneself"	P1, P2
		Consistency	Not all are consistent	"sometimes crave food"	P3, P1
	Social support	Family	Family support is essential	"my husband helps"	P4, P3, P5, P6
		Environment	Supportive neighborhood	"kind neighbors"	P4
	Disease impact	Daily activities	Some experience limitations; others remain active	"limited movement"	P4, P5
		Life experiences	Traumatic experiences influence condition	"lost a child"	P5
Mental health condition	Main problems	Behavioral	Non-adherence to treatment	"not routine"	P6
		Psychological	Stress affects condition	"afraid… overthinking"	P1, P6
	Coping strategies	Activities	Activities reduce stress	"fishing" "morning walk"	P1, P4
		Spiritual & adaptive	Spiritual approach & positive coping	"praying" "seeking information"	P5, P3
	Psychological condition	Emotional response	Emotions vary (stable–stressed)	"sometimes sad" "not thinking about it"	P4, P2
		Illness perception	Diabetes can be controlled	"cannot be cured, but can be controlled"	P2
	Mental health	Emotional response	Emotions range from stress, sadness, anxiety to stability	"high emotions" "not thinking about it"	P1, P4, P6, P2
		Stress level	Stress increases blood sugar	"when stressed, sugar rises"	P1, P4, P6
		Anxiety & fear	Feelings of fear and worry	"afraid of relapse"	P6, P4
		Self-acceptance	Some accept the illness well	"just take it easy"	P3, P5
		Coping mechanisms	Adaptive coping (activities, spirituality)	"fishing" "prayer"	P1, P5, P6
		Psychological influence	Psychological state directly affects physical condition	"when emotions rise, sugar rises"	P1, P4
		Stable mental health	Stable mental state supports disease control	"not stressed"	P2, P3
		Traumatic experiences	Trauma affects mental health	"lost a child"	P5
		Motivation & hope	Strong motivation and hope for recovery	"want to be healthy"	P4, P6

Depok II Community Health Center is a primary-level health facility located in Condong Catur Village, Depok District, Sleman Regency. The center provides maternal and child health services, dental and oral health care, and an innovative mental health program known as *KAK DEWA* (You Are Us, Leading in Mental Health), which focuses on routine monitoring of individuals with mental disorders through outreach and mobile

cadre-based services. In addition, the center prioritizes noncommunicable disease (NCD) management, particularly diabetes mellitus, by implementing prevention and control strategies through education, screening, and routine monitoring, including the *Prolanis* (Chronic Disease Management Program). NCD services at Depok II Community Health Center extend beyond clinical care, emphasizing the role of community health cadres in conducting home visits to provide education and monitor diabetes mellitus patients. This dual approach presents both opportunities and challenges in delivering community-based health services.

According to 2025 data, Depok II Community Health Center recorded 76 diabetes mellitus patients under the age of 60, distributed across seven hamlets in Condong Catur Village. The qualitative exploration of productive-age individuals with diabetes mellitus revealed a wide range of mental health experiences, including emotional responses, stress levels, anxiety and fear, self-acceptance, coping mechanisms, psychological influences, stable mental health, traumatic experiences, motivation, and hope. Observations during the interviews showed considerable variation in participant responses, ranging from highly expressive and enthusiastic to quiet and reserved.

During the interviews, the first informant demonstrated strong enthusiasm and spoke extensively about her clinical condition following her diabetes diagnosis, as well as the mental health challenges she encountered. Similarly, the sixth informant was highly engaged, particularly when describing her psychological experiences and mental health difficulties after being diagnosed. Other informants were initially hesitant to discuss their clinical condition and psychological struggles openly. Despite differences in communication styles; such as soft speech, calm demeanor, or emotional reactions when discussing family support all informants ultimately provided coherent narratives and shared their lived experiences with diabetes mellitus.

Based on these findings, the researcher conducted a thematic analysis to identify categories, main themes, subthemes, observational insights, and informant statements. The following table summarizes the thematic analysis of mental health issues among productive-aged individuals with diabetes mellitus based on interviews with six informants.

DISCUSSION

Productive age group with diabetes mellitus

The research findings presented in Table 2 show that respondents of the productive age group are unaware that they have diabetes. As a result, when they were examined, they had blood sugar values of 300 mg/dl while having no visible diabetic symptoms because their blood sugar changed frequently. This finding is congruent with the studies undertaken by McInerney Am (2022) [9].

According to Priyatno (2024) [16], genetic shifts in pancreatic beta cells derived from parents with type 2 diabetes mellitus influence pancreatic beta cell function abnormalities. Furthermore, respondents realized that high blood sugar levels were caused by everyday sweets consumption, abnormal sleep patterns, a hereditary propensity for diabetes mellitus passed down from their parents, and stress. The current illness process has made respondents more concerned about the necessary treatments, such as taking metformin and insulin injections. Self-awareness and social support (from family, close friends, and relatives) significantly raised respondents' concern about their health.

Diabetes Mellitus remains a noncommunicable disease, with a rising number of cases reported each year [10]. The findings of this study show that diabetes mellitus affects those aged 19 to 54, often known as the productive age group. This issue results from a lack of public awareness of the symptoms of diabetes mellitus. Furthermore, symptoms of diabetes mellitus occur gradually and are only known when the condition is chronic, such as a dramatic spike or decrease in blood sugar [9].

According to data from the Centers for Disease Control and Prevention (CDC), prediabetes and type 2 diabetes mellitus are becoming more common, particularly among people aged 20 to 44. Genetic and environmental factors influence the pathogenesis of type 2 diabetes mellitus. Genetic shifts in pancreatic beta cells derived from parents with type 2 diabetes mellitus alter pancreatic beta cell function in insulin production as well as insulin performance in blood glucose regulation [16]. In productive-age diabetes mellitus patients who have a risky diet, they are three times more likely to suffer from diabetes mellitus compared to respondents who have a non-risky diet [17]. Gender (male), obesity, and smoking behaviours (smoking) are all risk factors for diabetes mellitus, except occupational factors. The contributing factors listed above should serve as a resource for those providing optimal health care to diabetes mellitus sufferers. Diabetes Mellitus patients' efforts to maintain blood glucose levels above normal by paying attention to contributing factors, persuasive approaches to maintaining an ideal body mass index, regular exercise, quitting smoking through self-control, and posters on how to quit smoking to improve their health and quality of life at a productive age [18].

Mental health conditions

The adaptation process in the treatment of Diabetes Mellitus as a lifelong condition demands full support from all aspects [19]. One of the factors that contributes to non-compliance with Diabetes Mellitus management is lifelong treatment [20]. Non-compliance is one of the signs of psychological issues experienced by Diabetes Mellitus patients. Furthermore, stress caused by a lack of knowledge about the condition has an impact on the mental health of people with Diabetes Mellitus. Unstable mental health disorders necessitate the use of optimal coping strategies to ensure treatment quality. According to the interview data, the most common coping strategies utilised by respondents include stress-reduction activities, spiritual approaches, and positive self-affirmations. In Diabetes Mellitus sufferers, stress causes the release of hormones in the body that are connected to the insulin hormone generated by the pancreas [14]. Diabetes Mellitus patients who encounter stress need to relax their brains and will require numerous hormones, one of which is insulin, to keep blood sugar constant [14]. These three coping strategies are associated with emotional responses and disease perceptions. Respondents felt emotionally unstable and believed that diabetes could be managed.

People with type 2 diabetes mellitus and their families require health education and motivation to provide better support and guidance, and reduce anxiety. It is intended that health services will develop programs and counselling to alleviate anxiety in people with type 2 diabetes mellitus [19]. The study findings revealed that productive-age diabetes mellitus patients had a variety of psychological issues related to their medical condition, including stress, anxiety, fear, and sadness. Informants were concerned about the risk of relapse, complications, and the disease's influence on daily activities and productivity. These findings are backed by earlier research, which demonstrates that diabetics' mental health requires substantial attention. Chronic diabetes can provide a variety of obstacles in daily living. This condition can make individuals more vulnerable to psychological disorders like depression, anxiety, and stress. Mental health issues might impair patients' abilities to get treatment and manage their conditions. As a result, patients' physical health and quality of life may worsen [21].

The findings also explain that from a psychological perspective, several psychological conditions, such as "stress," "anxiety," "sadness," "fear," and "helplessness," are implied in concerns about the disease. This is evidenced by informants' statements such as "*fear of relapse," "sometimes sad,"* and the recognition that emotional states might alter blood sugar levels. These findings suggest that those with Diabetes Mellitus face emotional burdens as a result of the chronic condition, which must be managed for the rest of their lives. This is consistent with prior research, which found that sufferers can experience a variety of emotional responses that affect their mental well-being. Common symptoms include

hopelessness, depression, loneliness, helplessness, anxiety, anger, sadness, shame, and guilt. Individuals may also engage in more passive behavior and rely more heavily on others. Some sufferers may experience discomfort, confusion, and difficulty coping with their current condition. The accumulation of these various conditions can lead to feelings of discomfort and a lower overall quality of life [22].

This study also discovered that informants perceive a significant correlation between mental health and diabetes management. Most informants agreed that stress and negative emotions can raise blood sugar levels, evidenced in phrases like "when you're stressed, your blood sugar goes up" and "when your emotions go up, your blood sugar goes up." This study is consistent with psychoneuroendocrine theory, which states that stress can enhance the production of cortisol and adrenaline, influencing blood glucose regulation. In addition to physiological impacts, poor psychological well-being has the potential to diminish adherence to medication, dietary patterns, and physical activity required for diabetes management. As a result, mental health is a crucial factor to consider when working to manage diabetes effectively. This is corroborated by past research, which demonstrates that mental health is equally important as physical health in maintaining human life [23].

A healthy mental state enables individuals to accomplish various functions and activities to their full potential. Maintaining mental health allows other aspects of a person to develop and function more effectively. Furthermore, mental and physical health are related and influence one another. Thus, achieving a healthy mental state is fundamentally related to maintaining excellent physical health. As a result, people with diabetes mellitus in their productive years are expected to be able to enjoy a fulfilling life while managing their diabetes [23].

CONCLUSION

In conclusion, the study discovered that productive-age persons with diabetes mellitus had mental health issues after being diagnosed and treated. Various symptoms associated with mental health issues affect the quality of life of diabetes mellitus patients. People of productive age with diabetes mellitus have used social support, self-awareness, and coping skills to balance rising mental health issues with the positive ability to deal with the stress of long-term treatment. As a result, more action is required, specifically the diagnosis of mental health issues experienced by productive-age adults with diabetes mellitus, followed by the provision of appropriate mental health interventions.

Ethical consideration, competing interest, and source of funding

-This research has received approval from the Research Ethics Committee of the Yogyakarta Ministry of Health Polytechnic, with ethical clearance number DP.04-03/e-KEPK.1/1195/2025. This study adhered to ethical standards for research involving human participants. Ethical approval was obtained from the Health Research Ethics Committee of Panti Rapih Hospital Yogyakarta. All participants provided informed consent prior to data collection, and confidentiality was maintained throughout the research process.
-There are no conflicts of interest in this research.
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