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ORIGINAL ARTICLE

The use of herbal medicines and related factors among diabetic patients

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ABSTRACT

Diabetes mellitus (DM) is a chronic non-communicable disease characterized by elevated blood glucose levels due to insulin dysfunction. The use of herbal medicine has increased among patients with diabetes due to the widespread availability of information about herbal treatments globally. Many believe herbal remedies have minimal side effects and are more natural. The purpose of this study was to identify the factors associated with the use of herbal medicine among DM patients at Puskesmas Kampung Baru, Medan Maimun District. This quantitative, cross-sectional study was conducted from February to April 2025. The independent variables examined were age, education, income, knowledge, attitude, and belief, while the use of herbal medicine served as the dependent variable. The study population included all 809 registered DM patients at Puskesmas Kampung Baru. A sample of 189 was selected using a proportion difference test formula and a simple random sampling method. Bivariate data analysis was performed using the chi-square test. The results indicate that 164 (86.6%) respondents use herbal medicine. A significant association was found between herbal medicine use and age (p=0.019), income (p=0.000), knowledge (p=0.000), attitude (p=0.000), and belief (p=0.000). However, no significant association was found with education (p=0.089). Based on these findings, it is recommended that patients with diabetes mellitus receive counseling on the safe and evidence-based use of herbal medicine, with a strong emphasis on consulting healthcare professionals.

Keywords: diabetes mellitus, use of herbal medicine, age, income, behavior

Introduction

Diabetes mellitus (DM) is a chronic metabolic disease with a globally increasing prevalence. The condition is characterized by high blood glucose levels (hyperglycemia) resulting from impaired insulin production or function.[1] This can lead to various serious complications, including cardiovascular diseases, visual impairment, kidney failure, and lower-extremity amputation.[2] In Indonesia, the incidence of DM also shows an upward trend. According to 2018 Riskesdas data[3], the prevalence of DM among the population aged 15 years and older was 2%, a notable increase from 1.5% in 2013. This trend is also reflected in Medan City, particularly in the Medan Maimun District, where the number of DM patient visits to Puskesmas Kampung Baru exceeded 800 cases throughout 2023.[4]

Coinciding with the rising number of DM patients, a portion of the community has begun to shift towards alternative therapies, such as herbal medicine. The choice of herbal medicine is often based on the perception that these remedies are more natural, economical, and have relatively fewer side effects compared

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to conventional drugs.[5,6] In Indonesian culture, the use of *jamu* and traditional medicine has been a part of long-standing health practices. However, many people still lack a sufficient understanding of the effectiveness, safety, and benefits of using herbal medicine, especially in managing chronic diseases like DM.[7]

Research indicates that various factors influence the use of herbal and traditional medicine. Socio-demographic characteristics such as age, gender, education level, income, and geographical region play significant roles.[8,9] Cultural preferences, inherited knowledge, and beliefs in traditional medicine also contribute to its use.[8,10] Knowledge about herbal medicines, pro-CAM attitudes, and both magical and holistic health beliefs are associated with increased likelihood of herbal medicine use.[10] The presence of chronic diseases and the number of chronic disease episodes are additional factors influencing traditional medicine usage.[9] During the COVID-19 pandemic, patients chose herbal medicines due to their perceived efficacy, healing properties, safety, and reasonable pricing. Healthcare professionals' recommendations also played a role in patients' decisions to use herbal medicines.[11]

Despite the growing use of herbal medicine, its adoption rate in some regions, including Medan City, remains lower than that of modern medicine. Therefore, it is essential to identify the factors influencing the use of herbal medicine, particularly among patients with Diabetes Mellitus who are at risk of complications and require long-term management. This study aims to evaluate the factors associated with the use of herbal medicine among DM patients at Puskesmas Kampung Baru, Medan Maimun District.

Method

This study employed a quantitative approach with a cross-sectional design to explore the relationship between age, education level, income, knowledge, attitude, and belief with the use of herbal medicine among patients with Diabetes Mellitus at Puskesmas Kampung Baru, Medan Maimun District, Medan City. The research was conducted from February to April 2025. The population for this study included all 809 registered Diabetes Mellitus patients at Puskesmas Kampung Baru, according to 2023 visit data. A sample of 189 respondents was determined using a proportion difference test formula and was selected through simple random sampling to ensure a proportional representation of the population.

Data were collected via structured interviews using a pre-designed questionnaire. This questionnaire, composed of closed-ended questions with coded answers, was used to measure all study variables, including age, education, income, knowledge, attitude, belief, and the use of herbal medicine. Variable measurements were based on pre-established operational definitions. The dependent variable was the use of herbal medicine (used/not used), while the independent variables included age (adolescent, adult, elderly), education level (low, medium, high), income level (low, medium, high), and the dimensions of knowledge, attitude, and belief, which were classified based on questionnaire scores.

Data analysis was performed using SPSS version 25 software. Univariate analysis was used to describe the frequency distribution of each variable, while bivariate analysis utilized the chi-square test to examine the relationship between the independent and dependent variables at a 95% confidence level ($p<0.05$).

Results

Table 1 displays the frequency distribution of respondents' characteristics. Analysis by age demonstrates that the majority were adults (100 respondents, 52.9%), followed by elderly individuals (86 respondents, 45.5%), while adolescents comprised a small minority (3 respondents, 1.6%). Regarding education, over half of the respondents possessed a medium level of education (junior high to high school), totaling 103 individuals (54.5%). Respondents with low educational attainment (elementary school) numbered 32 (16.9%), whereas those with high educational attainment (university level) accounted for 54 individuals (28.6%).

The distribution of income indicated that most respondents had a medium income (101 respondents, 53.4%), while the low-income group comprised 86 individuals (45.5%). Only a small proportion fell into the high-income category (2 respondents, 1.1%). In terms of knowledge, the majority (155 respondents, 82%) demonstrated good knowledge, while 34 respondents (18%) had poor knowledge. Attitude results showed that 168 respondents (88.9%) exhibited a positive attitude, whereas 21 respondents (11.1%) displayed a negative attitude. With respect to beliefs, a substantial proportion (164 respondents, 86.8%) expressed belief in herbal medicine, while 25 respondents (13.2%) did not share this belief. Similarly, 164 respondents (86.8%) reported using herbal medicine, and 25 respondents (13.2%) indicated non-use.

Table 1 Respondent characteristics

Characteristics	Frequency (n=189)	Percentage (%)
Age		
Adolescents (10-18 years)	3	1,6%
Adults (19-59 years)	100	52,9%
Elderly (≥ 60 years)	86	45,5%
Education		
Low (Primary School)	32	16,9%
Intermediate (Junior High-Senior High)	103	54,5%
High (University)	54	28,6%
Income		
Low (< IDR 500,000)	86	45,5%
Intermediate (IDR 3,500,000 - 6,500,000)	101	53,4%
High (> IDR 6,500,000)	2	1,1%
Knowledge		
Poor (<75%)	34	18%
Good (≥ 75%)	155	82%
Attitude		
Poor (<75%)	21	11,1%
Good (≥ 75%)	168	88,9%
Belief		
No	25	13,2%
Yes	164	86,8%
Use of Herbal Medicine		
No	25	13,2%
Yes	164	86,8%

A breakdown of the bivariate analysis, presented in Table 2, illustrates the distribution of respondents according to the relationship between age and herbal medicine use at Puskesmas Kampung Baru, Medan Maimun District. Among the 164 respondents who reported using herbal medicine, 89 (89%) were adults aged 19–59 years, one (33.3%) was an adolescent, and 74 (86%) were elderly individuals aged ≥60 years. The chi-square test assessing the association between age and herbal medicine use yielded a p-value of 0.019 ($p < 0.05$), indicating a statistically significant relationship.

Table 2. Bivariate analysis

Variable	Use of Herbal Medicine				Total		*p-value*
	Use		Not use				
	N	%	n	%	n	%	
Age							
Adolescents (10-18 years)	1	33,3	2	66,7	3	100	0,019
Adults (19-59 years)	89	89	11	11	100	100	
Elderly (≥ 60 years)	74	86	12	14	86	100	
Education							
Low (Primary School)	24	75	8	25	32	100	0,089
Intermediate (Junior High-Senior High)	91	88,3	12	11,7	103	100	
High (University)	49	90,7	5	9,3	54	100	
Income							
Low (< IDR 500,000)	66	76,7	20	23,3	86	100	<0,001
Intermediate (IDR 3,500,000 - 6,500,000)	97	96	4	4	101	100	
High (> IDR 6,500,000)	1	50	1	50	2	100	
Knowledge							
Poor (<75%)	19	55,9	15	44,1	34	100	<0,001
Good (≥ 75%)	145	93,5	10	6,5	155	100	
Attitude							
Poor (<75%)	4	19	17	81	21	100	<0,001
Good (≥ 75%)	160	95,2	8	4,8	168	100	
Belief							
No	4	16	21	84	25	100	<0,001
Yes	160	97,6	4	2,4	164	100	

Analysis of the association between education level and herbal medicine use revealed that, among the 164 users, 91 (88.3%) had completed secondary education (SMP–SMA), 24 (75%) had primary education (SD), and 49 (90.7%) had higher education (university). The chi-square test produced a p-value of 0.089 (p

> 0.05), suggesting no significant association between education level and herbal medicine use. Regarding income, among the 164 herbal medicine users, 97 (96%) reported medium income levels (Rp 3,500,000–Rp 6,500,000), one (50%) reported high income (> Rp 6,500,000), and 66 (76.7%) reported low income (< Rp 3,500,000). The chi-square analysis yielded a p-value of 0.000 ($p < 0.05$), indicating a significant relationship between income and herbal medicine use. The association between knowledge and herbal medicine use revealed that, of the 164 users, 145 (93.5%) demonstrated good knowledge, whereas 19 (55.9%) had poor knowledge. The chi-square test results, with a p-value of 0.000 ($p < 0.05$), indicate a significant relationship between knowledge level and herbal medicine use.

Concerning attitude, among the 164 respondents who used herbal medicine, 160 (95.2%) exhibited a positive attitude, while 4 (19%) had a negative attitude. The chi-square test produced a p-value of 0.000 ($p < 0.05$), confirming a significant association between attitude and herbal medicine use. Finally, the relationship between belief and herbal medicine use showed that of the 164 users, 160 (97.6%) believed in the efficacy of herbal medicine, while 4 (16%) did not. The chi-square analysis resulted in a p-value of 0.000 ($p < 0.05$), demonstrating a significant relationship between belief and herbal medicine use.

Discussion

Based on the research findings, a significant association was identified between age and the use of herbal medicine among patients with diabetes mellitus at Puskesmas Kampung Baru. Age influences a patient's inclination to choose herbal medicine as an alternative or complementary treatment alongside conventional therapy. Biologically and socially, older adults—particularly the elderly—are more likely to prefer or combine conventional medicine with herbal remedies. As individuals age, the prevalence of chronic conditions such as diabetes, hypertension, and rheumatism generally increases, motivating them to seek alternative treatments perceived as more natural and carrying fewer side effects.[8] Additionally, older patients often possess extensive prior experience with traditional medicine, fostering greater trust in its efficacy. Limited access to modern healthcare facilities and the influence of social factors, such as familial and community support for traditional practices, further encourage the elderly to use herbal remedies to maintain or restore health.[12,13] These findings align with previous studies demonstrating a significant relationship between age and herbal medicine utilization.[14]

In contrast to age, this study found no significant association between formal education level and the use of herbal medicine among patients with diabetes mellitus at Puskesmas Kampung Baru. Although education can shape health knowledge, the use of herbal medicine is often driven by entrenched traditional beliefs and cultural practices and does not necessarily correlate with formal education levels.[8,15] This suggests that other factors (such as cultural norms, family habits, and accessibility of alternative health services) have a more substantial influence on the decision to use herbal medicine than educational attainment. This observation concurs with other research that similarly reported no significant relationship between education and herbal medicine use.[16] Furthermore, several studies propose that personal experience and the influence of key individuals or social environments play crucial roles in treatment decisions.[17]

Income level was significantly associated with herbal medicine use among patients with diabetes mellitus at Puskesmas Kampung Baru. Socioeconomic status broadly affects access to and utilization of health services, including treatment choices. Notably, herbal medicine use was not restricted to low-income groups but was also prevalent among those with moderate incomes. Individuals with higher incomes typically have greater access to a variety of treatment options, both conventional and alternative, while lower-income groups may prefer herbal remedies primarily due to affordability.[17] These findings are supported by other studies indicating that herbal medicine use spans diverse income groups and is influenced by multiple factors (including economic considerations, cultural beliefs, and public perceptions) rather than income alone.[18]

The results also indicate a significant association between knowledge and the use of herbal medicine. Respondents with good knowledge about herbal treatments were more likely to utilize them for managing their health conditions. Knowledge serves as a primary determinant in health-related decision-making, including the adoption of herbal therapies. Individuals with adequate understanding of the benefits, mechanisms, and safety of herbal medicine tend to demonstrate greater confidence in their use. Information obtained from healthcare professionals, the media, or personal experience can reinforce these beliefs. These findings corroborate prior research showing that comprehensive knowledge of traditional medicine is pivotal in encouraging self-use of herbal remedies among patients with chronic diseases.[19]

This study further reveals a significant association between attitude and herbal medicine use. Patients holding positive attitudes towards herbal medicine were more inclined to incorporate it into their treatment regimen.[20] Such attitudes often reflect beliefs that herbal medicine is safe, natural, and effective in controlling blood glucose levels. Attitude constitutes a key component in treatment decision-making, shaped by knowledge, beliefs, and prior experience. Moreover, social norms (including influences from family members, community leaders, and local cultural beliefs) can further shape individuals' attitudes towards traditional medicine.[16]

Finally, the findings demonstrate a significant association between belief and herbal medicine use. Patients with strong beliefs in the effectiveness and safety of herbal medicine tend to use it more frequently. These beliefs often derive from personal experience, familial influence, cultural heritage, and community endorsement of herbal remedies' efficacy in managing diabetes symptoms. Traditional medicine is frequently regarded as a cultural legacy validated over generations, which bolsters public trust in its effectiveness. Additionally, perceptions of herbal medicine as safer and associated with fewer side effects than chemical drugs reinforce a positive public attitude towards its use. Consequently, belief constitutes a critical factor in understanding and promoting herbal medicine use, especially within the context of chronic disease management.[21] Consistent with these findings, other research highlights that patients' motivation to use herbal medicine may stem from dissatisfaction or uncertainty regarding conventional treatments and concerns about the excessive use of chemical pharmaceuticals.[22–24]

Conclusion

This study included 189 respondents, predominantly adults and elderly individuals with intermediate levels of education and income. The majority demonstrated good knowledge, positive attitudes, and strong beliefs regarding herbal medicine, as reflected by the high prevalence of herbal medicine use (86.8%). Statistical analysis revealed significant associations between several factors and herbal medicine utilization. Age was a particularly strong predictor, with adults and elderly respondents exhibiting higher likelihoods of use, potentially due to more deeply rooted traditional experiences and beliefs within these groups. Income was also significantly correlated with use; although herbal medicine usage was not confined to low-income respondents, a substantial proportion of middle-income individuals reported using it. These findings suggest that economic factors, alongside perceptions and beliefs, critically influence treatment choices, irrespective of income level. Additionally, knowledge, attitude, and belief emerged as important determinants, with respondents possessing good knowledge, positive attitudes, and strong convictions regarding the efficacy of herbal medicine being more likely to utilize it. Such beliefs often originate from personal experience, cultural heritage, and the perception that herbal medicine offers a safer, more natural alternative to conventional pharmaceuticals. Notably, no significant relationship was observed between formal education level and herbal medicine use, implying that cultural beliefs, familial practices, and individual experience predominantly drive utilization decisions rather than formal educational attainment.

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