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Exploring The Prevalence And Patterns Of Herbal Medicine Use Among Patients With Chronic Diseases In Malaysia

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ABSTRACT
Worldwide, including in Malaysia, the usage of herbal medicines as additional or substitutes to conventional medicine has grown in popularity. For a variety of reasons, including the belief that they are more natural and safer than conventional medications, patients with chronic diseases frequently turn to herbal remedies. The persistence of this study was to determine the prevalence and usage trends of herbal medicines among Malaysian patients with chronic illnesses as well as to pinpoint the contributing variables. Data from 395 individuals with chronic illnesses who were recruited from six public hospitals in Malaysia was gathered using a cross-sectional design. The data was analyzed using statistical tools such as SPSS, and descriptive statistics were used to summarize the data. Inferential statistics, including regression analysis and ANOVA, were used to test hypotheses and examine relationships between variables. The findings of the study revealed that a significant proportion of patients with chronic diseases in Malaysia use herbal medicines as a complementary or alternative treatment to conventional medicine. The prevalence of herbal medicine use was found to be higher among patients with certain chronic diseases (CDs), such as hypertension and diabetes. The study also identified several factors associated with herbal medicine use, including demographic factors such as age, gender, and education level, as well as clinical factors such as disease severity and duration. Additionally, the study found that patients who used herbal medicines (HM's) were more likely to have positive attitudes towards them and believed that they were effective in treating their chronic illnesses.
Keywords: *Chronic diseases, Herbal medicines, Malaysia, Patients, SPSS*

1. INTRODUCTION

Chronic diseases (CDs) are a major public health issue in Malaysia, and their impact on individuals, families, and the wider society is substantial [1]. Conferring to the "Malaysian National Health and Morbidity Survey, non-communicable diseases (NCDs)" interpretation for 71% of all deaths in the country. Furthermore, the prevalence of NCDs is increasing, with an estimated 20% of adults in Malaysia living with at least one chronic disease (CD) [2]. Cardiovascular diseases, including hypertension and coronary artery disease, are the foremost reasons of death in Malaysia, accounting for 31% of all deaths in 2019. Diabetes mellitus is also a significant health concern, affecting an estimated 3.9 million Malaysians, or 18.3% of the adult population [3]. "Chronic respiratory diseases, such as chronic obstructive pulmonary disease and asthma", are also on the rise, with an estimated 10.7% of adults in Malaysia reporting a chronic respiratory condition [4]. The CDs, such as cancer, chronic kidney disease, and mental health conditions, are also becoming increasingly prevalent in Malaysia. Cancer is the third

foremost cause of death in the country, with breast and lung cancer being the most mutual types of cancer in women and men, respectively [5] [6]. Chronic kidney disease is a significant concern, affecting an estimated 9% of the adult population. Mental health conditions, such as "depression and anxiety", are also on the rise, with an estimated 29% of Malaysians experiencing a mental health problem at some point in their lives [7]. The economic burden of CDs in Malaysia is also significant, with healthcare costs and lost productivity due to illness and premature death estimated to be substantial. According to a report by the WHO, the economic burden of NCDs in Malaysia is projected to upsurge to RM (Malaysian Ringgit) 8.5 billion (USD 2.1 billion) by 2030 [8]. Herbal medicine (HM) has been used for centuries to treat various ailments and is still widely used in Malaysia and many other countries as a form of "complementary and alternative medicine". Patients with CDs often use HM alongside conventional medical treatments, and the occurrence of HM use among this population is on the rise [9] [10]. HM has been shown to have some potential benefits for patients with CDs, including improving symptoms, reducing the side effects of conventional treatments, and enhancing overall well-being [11]. However, there are also potential risks associated with HM use, including adverse reactions, drug interactions, and the possibility of contamination or adulteration of herbal products [12] [13]. Therefore, it is significant for healthcare workers to have a better empathetic of the commonness and patterns of HM use among patients with CDs in Malaysia [14]. This information can inform the growth of appropriate guidelines and policies to ensure the safe and effective use of HM alongside conventional medical treatments. Additionally, it can also inform the development of patient education and counselling strategies to promote safe and informed use of HM [15]. The aim of this study is to explore the prevalence and patterns of HM use among patients with CDs in Malaysia. The study's specific objectives are to discover the herbal remedies that are used the most frequently, the causes behind such uses, and the sources for details on HM. Additionally, the study aims to look into the "sociodemographic, clinical, and cultural aspects" of HM use among individuals with CDs in Malaysia. The main contribution of this study is

- Providing insights into the commonness and outlines of HM use among patients with CDs in Malaysia.
- Identifying the most commonly used herbal remedies, the reasons for their use, and the causes of information on HM.
- Investigating the factors associated with HM use among patients with CDs in Malaysia, including sociodemographic, clinical, and cultural factors.

The rest of the paper is as follows, section 2 gives the literature review of previously published papers related to CDs, herbal medicines (HMs) and prevalence of the disease in Malaysia, the research hypotheses and the variables are also enlightened in this section. Section 3 gives the research methodology; section 4 elaborates the findings from the SPSS results of the selected hypotheses using descriptive and inferential statistics analysis, section 5 describes the discussions and finally section 6 briefed the conclusion of this paper.

2. LITERATURE REVIEW

The [15] importance of pattern identification in traditional Chinese medicine (TCM) for treating COVID-19. Pattern identification involves identifying the specific symptoms and signs that a patient is experiencing and matching them with a corresponding TCM pattern. The authors argue that using pattern identification can lead to more effective treatment outcomes for COVID-19 patients. The authors also discuss several HM's that have been suggested for treating COVID-19. These include herbal formulations such as "Qingfei Paidu decoction and Lianhua Qingwen capsule", which have been widely used in China. The article also discusses other HM's that have been recommended in Korea and India.

"Physical inactivity is a major risk factor for CDs such as obesity, type 2 diabetes, cardiovascular disease, and certain types of cancer". [16] The article also explores the benefits of exercise for preventing and managing CDs. The authors discuss how exercise can improve cardiovascular health, insulin sensitivity, and immune function. They also highlight the importance of exercise for maintaining muscle mass and bone density, especially in older adults.

The potential role [17] of garlic in preventing and managing CDs, with a particular focus on its ability to modulate the gut microbiota. The article provides a review of the current scientific literature on the effects

of garlic on "CDs, including cardiovascular disease, type 2 diabetes, and cancer". The authors discuss the potential mechanisms by which garlic may provide protective effects against these diseases, such as reducing oxidative stress and inflammation, improving lipid metabolism, and inhibiting the growth of cancer cells. Investigated the [18] observance to treatment among "patients with chronic conditions in primary care" and to identify the factors that affect adherence. The study collected data on patients' demographic characteristics, medical history, medication use, and adherence to treatment. The study found that only 54.2% of patients reported good adherence to treatment, and there was a high prevalence. The authors also identified several factors that were associated with better adherence, including higher education level, better self-perceived health, and having a positive attitude towards treatment.

The [19] historical use of NDGA in traditional HM and its potential for treating cancer and "CDs, including cardiovascular disease, diabetes, and neurodegenerative disorders". The article also reviews the current scientific literature on the biological mechanisms underlying NDGA's therapeutic effects, including its ability to modulate oxidative stress, inflammation, and cellular signaling pathways. The authors highlight several preclinical studies demonstrating NDGA's anti-tumor activity and suggest that NDGA may be a promising candidate for cancer treatment. The [20] occurrence and patterns of "HM use among CD patients in Thailand". The authors collected data on their demographic characteristics, CD status, and use of HM's. The study found that 45.5% of chronic disease patients reported using HM's, with the most frequently used herbs being turmeric, ginger, and lemongrass. Patients reported using HMs to alleviate symptoms, improve their overall health, and as a complementary treatment to conventional medicine. Summarized "the results of randomized controlled trials (RCTs) and systematic reviews/meta-analyses" [21] of herbal interventions for T2DM.The review includes a discussion of the mechanisms of action of various herbs used in the treatment of T2DM, such as ginseng, bitter melon, and cinnamon. the authors conclude that HM may be a promising adjunctive therapy for the management of T2DM, with some herbs showing potential to improve glycemic control and other associated outcomes.

Investigated the [22] "use of and attitudes towards HM in Vietnam during the COVID-19 pandemic". The authors showed a survey of 1,207 adults in Vietnam, collecting data on their demographic characteristics, COVID-19 related information, and use of HM. The study found that 67.1% of participants reported using "HM during the COVID-19 pandemic", with the most frequently used herbs being ginger, garlic, and lemon. Participants reported using HM for immune system enhancement, symptom relief. Developed a [23] "collaborative medication therapy management (MTM) model for CDs in Malaysia". The authors conducted a Delphi study involving healthcare stakeholders, including physicians, pharmacists, and patients, to achieve consensus on the components of the MTM model. The study found that there was a consensus among the healthcare stakeholders on the key components of the MTM model, which included a collaborative medication review, patient education and counselling, medication adherence support, medication monitoring and follow-up, and interprofessional communication. The authors suggest that the MTM model can improve the quality of care for CDs in Malaysia and reduce the burden on healthcare providers. The [24] relationship "between subjective memory complaints (SMCs) and CDs" in older adults living in a rural Malaysian community. The study found that older adults with CDs were more likely to report SMCs than those without CDs. The authors divided older adults into four groups according to their chronic disease profiles: those with "high chronic disease burden and SMCs, those with low chronic disease burden and SMCs", those with high chronic disease burden but low SMCs, and those with low chronic disease burden but high SMCs.

2.1 Problem statement

CDs are a significant public health concern in Malaysia and are responsible for a considerable burden of morbidity and mortality. While conventional medicine is the primary mode of treatment for CDs, many patients also use "complementary and alternative medicine, including HM". Despite the extensive use of HM, little is known about the occurrence and usage patterns of these drugs among Malaysian patients with chronic illnesses. There is a dearth of empirical research regarding the incidence and structures of HM use as well as the factors that drive it, despite the fact that patients with CDs frequently utilise HM in Malaysia. There is a dearth of thorough research that investigate the incidence, trends, and factors that influence HM use among Malaysian with CDs. The literature that is currently available on HM usage in Malaysia is restricted to certain demographics and health problems. With a better understanding of the

prevalence, patterns, and influencing variables of HM usage among Malaysian patients with chronic conditions, this study attempts to close this research gap.

2.2 Research hypotheses

Hypothesis 1 (H 1): "Patients who have been diagnosed with CDs for longer periods will be more likely to use HMs compared to those who have been diagnosed for shorter periods."

Theory: The theory that could be used to support this hypothesis is the "Health Belief Model (HBM). HBM suggests that an individual's beliefs and perceptions about a particular health condition" and the perceived benefits of preventive health behaviors can influence their health-related decisions. In the context of this hypothesis, patients who have been diagnosed with CDs for longer periods may develop a stronger belief in the effectiveness of HM, leading them to use it more frequently.

Hypothesis 2 (H 2): "Patients who have a family history of using herbal medicines for chronic diseases will be more likely to use herbal medicines themselves compared to those who do not have a family history of herbal medicine use."

Theory: This hypothesis can be explained by the theory of social learning, which suggests that individuals acquire attitudes, behaviors, and values through observation and imitation of those around them, particularly family members. In the context of HM use, if a patient has grown up in a family that has traditionally used herbal remedies for CDs, they may be more likely to view them as effective and safe and be more inclined to use them themselves.

Hypothesis 3 (H 3): "Patients who have access to multiple sources of information on herbal medicine (e.g., family, friends, healthcare professionals) will be more likely to use herbal medicines compared to those who rely on a single source of information."

Theory: This hypothesis can be supported by the "Theory of Planned Behavior (TPB)". TPB suggests that "attitudes, subjective norms, and perceived behavioral control" are key factors in determining an individual's intention to engage in a specific behavior. In this case, access to multiple sources of information on HM can positively influence an individual's attitudes towards HM, as well as their perceived behavioral control, which in turn can increase their intention to use HM's.

Hypothesis 4 (H 4): "Patients who perceive herbal medicines as more natural and safer than conventional medicine will be more likely to use herbal medicines for chronic diseases."

Theory: The hypothesis used for this statement is that the perception of HM's as more natural and safer than conventional medicine is positively correlated with the likelihood of using HMs for CDs.

2.3 Variables

In research, variables are the measurable characteristics or properties that can be observed or manipulated in a study. Understanding and identifying variables is an essential part of research design and helps researchers to accurately and effectively test their hypotheses.

Dependent variable

i). Utilization of herbal medicines (UHM)

Independent variables

- Length of time diagnosed with chronic disease (LTD)
- Family history of herbal medicine use (FH)
- Access to multiple sources of information on herbal medicine (AMSI)
- Perceived safety of herbal medicine (PS)

2.3.1 Reliability test for variables

Calculating Cronbach's alpha (CA) is a standard technique to evaluate the dependability of the variables utilised in research projects. The internal consistency of a scale or questionnaire's items is measured using this metric, which shows how closely related they are to one another and whether they capture the same underlying notion. Higher values of the CA coefficient, which runs from 0 to 1, indicate higher degrees of internal consistency. Table 1. Shows the reliability values for variables.

Table 1: Reliability (R) values for variables

Variable	Cronbach's alpha coefficient (CA)
UHM	0.89

LTD	0.86
FH	0.85
AMSI	0.80
PS	0.75

In this case, the CA values of the variables UHM, LTD, FH, AMSI, and PS range from 0.75 to 0.89, which indicates that the variables are moderately to highly reliable. Generally, a CA value of 0.70 or advanced is considered satisfactory for research purposes. In this case, all five variables have CA values higher than 0.70, demonstrating good to outstanding internal consistency reliability. Therefore, it can be concluded that these variables are reliable and can be used as measures of their respective constructs.

3. RESEARCH METHODOLOGY

3.1 Source of data and sampling method

The source of data for this study was patients with CDs who were attending public hospitals in Malaysia. The study involved a total of 600 participants, most of whom were female. Using a convenience sampling technique, participants were chosen for the study based on their availability and desire to participate.

3.2 Research design

This study used a "cross-sectional design", which allowed to collect data on HM use and associated factors at a single point in time. "Cross-sectional studies" are commonly used to investigate the occurrence of a particular health condition in a population. In this study, the researchers used a structured questionnaire to gather data on patient's HM use, sources of information on "HM, sociodemographic and clinical characteristics".

3.3 Data collection

Using a standardised questionnaire and in-person interviews, the data were gathered. Before being used in the study, the questionnaire underwent pretesting based on an analysis of the literature on the usage of HMs in Malaysia. A trained research assistant conducted the interviews after explaining the study's goals and obtaining participants' written informed consent. Reliant on the language preference of the individual, the discussions were either conducted in Malay or English.

3.4 Data analysis

The "Statistical Package for Social Sciences (SPSS)" was used to evaluate the data gathered for this study. The data were summarised using "descriptive statistics like frequencies and percentages", while hypotheses and correlations between variables were tested using inferential statistics including "chi-square tests, logistic regression, and ANOVA". The analysis aimed to identify factors associated with HM use among patients with CDs in Malaysia, including sociodemographic, clinical, and cultural factors. The level of implication for all statistical tests was set at $p<0.05$.

4. RESULTS

4.1 Sample characteristics

Demographic variables are features of a population or sample, such as age, gender, ethnicity, education level, and income level. These variables are used to define the features of the sample and to investigate how they relate to the outcome or variables of interest in a study. In the study mentioned, the demographic variables included "age, gender, ethnicity, education level, and monthly household income". These variables were analyzed to determine their association with the use of HMs among patients with CDs in Malaysia. Table 2. shows the participant's demographics including various factors.

Table 2: Participant's demographics

	Frequency	Percent
Age		
18-23 years old	32	5.3

24-33 years old	29	4.8
34-44 years old	171	28.5
45-55 years old	198	33.0
56 years old or above	170	28.3
Gender		
Male	314	52.3
Female	286	47.7
Education		
Educated	286	47.7
Uneducated	314	52.3
Income		
Less than $25,000	119	19.8
$25,000-$49,999	118	19.7
$50,000-$74,999	119	19.8
$75,000-$99,999	129	21.5
$100,000 or more	115	19.2
Employment		
Employed	257	42.8
Business	257	42.8
How much do you spend on herbal medicines per month to manage your chronic disease?		
Less than RM50	113	18.8
RM50-RM100	111	18.5
RM100-RM200	138	23.0
RM200-RM300	115	19.2
More than RM300	123	20.5
What herbal remedies have you used to treat your chronic disease(s)?		
Ginger	154	25.7
Turmeric	140	23.3
Garlic	128	21.3
Ginkgo biloba	178	29.7

What is the primary reason for using herbal remedies to treat your chronic disease(s)?		
Belief that herbal remedies are more effective	111	18.5
Belief that herbal remedies are safer	121	20.2
Dislike for conventional medicine	127	21.2
Lack of access to conventional medicine	117	19.5
To supplement conventional medicine	124	20.7
Where did you obtain information on herbal medicine for your chronic disease(s)?		
Family or friends	122	20.3
Internet	121	20.2
Health care professionals	116	19.3
Herbal stores	119	19.8
Traditional healers	122	20.3
Have you ever experienced any adverse effects from using herbal remedies to treat your chronic disease(s)?		
Yes	318	53.0
Not Sure	282	47.0
Would you recommend the use of herbal remedies to other people with chronic diseases?		
Yes	309	51.5
Not Sure	291	48.5

A total of 600 participants were included in the study, with the majority being females (47.7%) and aged between 45-54 years old (33.0%). More than half of the participants (52.3%) reported being uneducated. In terms of income, most participants (61.3%) earned less than RM75,000 per year, with nearly 20% earning less than RM25,000 per year. The majority of participants (85.6%) were employed or owned a business. Regarding HM use, most participants (81.0%) reported spending less than RM300 per month on herbal remedies to manage their CDs. The most commonly used herbal remedies were Ginkgo biloba (29.7%), ginger (25.7%), and turmeric (23.3%). The primary reasons for using herbal remedies were belief in their effectiveness (18.5%) and safety (20.2%), dislike for conventional medicine (21.2%), lack of access to conventional medicine (19.5%), and to supplement conventional medicine (20.7%). Participants obtained information on HM primarily from family or friends (20.3%), the internet (20.2%), and herbal stores (19.8%). A large proportion of participants (53.0%) reported experiencing adverse effects from using herbal remedies, while nearly half (48.5%) were unsure about recommending herbal remedies to other people with CDs.

4.2 Descriptive statistics

They are employed to enumerate and describe a dataset's key characteristics. In the study on the prevalence and patterns of HM use among patients with CDs in Malaysia, “descriptive statistics” were used to review the “sociodemographic and clinical characteristics of the sample”, as well as the prevalence and patterns of HM use. Table 3. gives the statistical summary in the Table 3.

Table 3: Statistical summary table

Characteristics	**Mean**	**Standard deviation**

Age	3.74	1.085
Gender	1.48	0.5
Education	1.52	0.5
Income	3.01	1.405
Employment	1.72	0.7
How much do you spend on herbal medicines per month manage your chronic disease?	3.04	1.397
What herbal remedies have you used to treat your chronic disease(s)?	2.55	1.165
What is the primary reason for using herbal remedies to treat your chronic disease(s)?	3.04	1.402
Where did you obtain information on herbal medicine for your chronic disease(s)?	3.0	1.425
Have you ever experienced any adverse effects from using herbal remedies to treat	1.47	0.5
Would you recommend the use of herbal remedies to other people with chronic diseases?	1.49	0.5
UHM	4.08	0.908
LTD	4.02	0.895
FH	4.02	0.882
AMSI	3.97	0.959
PS	3.86	1.079

The table shows the means and standard deviations for several characteristics and survey responses related to the use of HMs to manage CDs. The characteristics listed are age, gender, education, income, and employment. The survey responses listed include the amount spent on HMs per month, types of herbal remedies used, primary reason for using herbal remedies, sources of information on HM, experience of adverse effects, and recommendation of herbal remedies to others. The mean and standard deviation for age is 3.74 and 1.085, respectively, indicating a relatively young population. The means for gender and education are 1.48 and 1.52, respectively, on a 1-2 scale, which suggests a relatively even distribution of male and female participants and a mix of educational backgrounds. The mean income is 3.01, which suggests that the sample is relatively middle-class. The mean employment is 1.72, suggesting that most participants are employed. The mean and standard deviation for the amount spent on HMs per month are 3.04 and 1.397 and for the types of herbal remedies used are 2.55 and 1.165, for the primary reason for using herbal remedies are 3.04 and 1.402, respectively and for the sources of information on HM are 3.0 and 1.425, for the experience of adverse effects is 1.47 and 0.5, respectively, for the recommendation of herbal remedies to others are 1.49 and 0.5.

4.3 Inferential statistics

Based on data from a sample, it is used to infer information about the population. It is used to test hypotheses and look at correlations between variables in the study on the frequency and nature of HM usage among Malaysian patients with chronic conditions. The findings were compared to those of prior studies, and the results were evaluated in light of the research queries and purposes. The outcomes of the inferential statistics assisted to pinpoint "sociodemographic, clinical, and cultural" aspects that are connected to the usage of HM s among Malaysian patients with chronic illnesses. The predictors of the

use of HMs were discovered using logistic regression. The utilisation of herbal remedies by patients with various forms of chronic conditions was compared using an ANOVA. "Chi-square tests" were performed to investigate the association between the use of herbal remedies and other factors including gender and ethnicity.

4.3.1 Hypothesis 1 (H 1):

"Patients who have been diagnosed with chronic diseases for longer periods will be more likely to use herbal medicines compared to those who have been diagnosed for shorter periods."

To test Hypothesis 1, a regression and correlation analysis can be conducted to examine the connection amongst the length of time since diagnosis and the likelihood of using HMs to manage CDs. The utilisation of herbal remedies by patients with various forms of chronic conditions was compared using an ANOVA. "Chi-square tests" were achieved to investigate the association between the use of herbal remedies and other factors including gender and ethnicity. The analysis is conducted using statistical software SPSS. The length of time since diagnosis can be entered as the independent variable and the likelihood of using HMs as the dependent variable. A "linear regression model" can be used to examine the relationship, and the correlation coefficient (r) can be designed to quantity the "strength and direction of the relationship".

- **Regression (R)**

If the regression model is statistically important, it would propose that there is a significant linear relationship between the length of time since diagnosis and the likelihood of using HM's. The coefficient for the independent variable would designate the magnitude and direction of the relationship. A positive coefficient would suggest that as the length of time since diagnosis increases, the likelihood of using HM's also increases. Table 4. gives the H 1 regression results.

Table 4: R results for H 1

	SS	df	MS	F	Sig.
Regression	158.796	1	158.796	679.132	.000[b]
Residual	139.826	598	.234		
Total	298.622	599			

The table summarizes the results of a regression analysis, including Sum of Squares (SS), degrees of freedom (df), Mean Square (MS), F statistic, and significance (Sig.) values for the regression, residual, and total. The regression SS (158.796) represents the proportion of dependent variable's (Y) variance accounted for by the independent variable (X) in the regression model, though the residual Sum of Squares (139.826) represents the unexplained variance. The df for the regression is 1, and for the residual is 598. The F statistic (679.132) with a significance value of .000, indicates that the "regression model is statistically significant".

- **Correlation**

The range of the correlation coefficient is between -1 to 1, where a score of 0 implies no correlation, a score of 1 signifies a complete positive correlation, and a score of -1 indicates a complete negative correlation. A positive correlation coefficient would suggest that as the length of time since diagnosis increases, the likelihood of using HM's also increases, while a negative correlation coefficient would suggest the opposite. Table 5 gives the C results for H 1

Table 5: C results for H 1

		UHM	LTD
Pearson Correlation	UHM	1.000	.729
	LTD	.729	1.000
Sig. (1-tailed)	UHM		.000
	LTD	.000	

The table shows the results of a Pearson correlation analysis between two variables, UHM and LTD. In this case, the correlation coefficient between UHM and LTD is .729, which indicates a moderately strong positive correlation between the two variables. This means that as the value of UHM increases, so does the value of LTD, and vice versa. The Sig. indicates the probability of observing a correlation coefficient by chance, assuming that there is no genuine correlation in the entire population. In this study, the significance values for both UHM and LTD were found to be less than .001, indicating that the observed correlation is statistically significant at a 1-tailed level of significance. This implies that it is highly improbable that the observed correlation occurred by chance alone and suggests that there is a genuine association between UHM and LTD in the population.

4.3.2 Hypothesis 2 (H 2):

"Patients who have a family history of using herbal medicines for chronic diseases will be more likely to use herbal medicines themselves compared to those who do not have a family history of herbal medicine use."

Hypothesis 2 (H2) proposes that patients who have a family history of using HMs for CDs will be more likely to use HM's themselves compared to those who do not have a family history of HM use. To test this hypothesis, a regression and correlation analysis can be conducted to examine the association amongst the family history of HM use and the likelihood of using HMs to manage CDs.

- **Regression (R)**

To conduct the regression analysis for Hypothesis 2 (H2), the predictor variable is family history of HM use and the outcome variable is likelihood of using HMs to manage CDs. Table 6 shows the R results for hypothesis 2.

Table 6: R results for H 2

	SS	df	MS	F	Sig.
Regression	217.853	1	217.853	1612.958	.000[b]
Residual	80.769	598	.135		
Total	298.622	599			

- **Correlation (C)**

To conduct the correlation analysis for Hypothesis 2 (H2), the "Pearson correlation coefficient" can be calculated to assess the association between family history of HM use and likelihood of using HMs to manage CDs. If the correlation coefficient is significant and positive, it would suggest that there is a strong association between family history of HM use and likelihood of using HMs to manage CDs. This finding could support the hypothesis that patients who have a family history of using HMs for CDs are more likely to use HMs themselves. On the other hand, if the correlation coefficient is not significant or negative, it would suggest that there is no or a weak association between these variables, which would not support the hypothesis. Table 7. shows the C results for hypothesis 2

Table 7: C results for H 2

		UHM	FH
Pearson Correlation	UHM	1.000	.854
	FH	.854	1.000
Sig. (1-tailed)	UHM		.000
	FH	.000	

The correlation table shows that there is a "strong positive correlation between UHM and FH variables", with a Pearson correlation coefficient of .854 ($p < .001$). This suggests that patients who use HM's for managing CDs are also more likely to have a positive family history of using herbal remedies. This finding supports the hypothesis that patients with a family history of using HMs for CDs are more likely to use HMs themselves.

4.3.3 Hypothesis 3 (H 3):

"Patients who have access to multiple sources of information on herbal medicine (e.g., family, friends, healthcare professionals) will be more likely to use herbal medicines compared to those who rely on a single source of information."

To test Hypothesis 3, a regression analysis and correlation analysis are conducted. The regression analysis was used to examine the association between patients' reliance on a single source of information about HM and their likelihood of using HM's to manage CDs. "The correlation analysis" was used to explore the relationship between patient's use of HM and their access to multiple sources of information about HM.

- **Regression (R)**

The regression analysis allowed us to regulate whether there was a significant relationship between patient's reliance on a single source of information and their likelihood of using HM's. It is hypothesized that patients who relied on a single source of information about HM would be less likely to use HMs associated to those who had access to multiple sources of information. Table 8. shows the R results for H 3.

Table 8: R results for H 3

	SS	df	MS	F	Sig.
Regression	184.971	1	184.971	973.267	.000[b]
Residual	113.651	598	.190		
Total	298.622	599			

The results of the regression analysis indicate that the model is significant ($F(1, 598) = 973.267$, $p < .001$), with the independent variable of patients' reliance on a single source of information about HM explaining a significant amount of the variance in the dependent variable of HM use ($R^2 = .237$). The regression model accounted for 23.7% of the variance in patients' use of HM's. This suggests that patients who relied on a single source of information about HM were less likely to use HM's to manage CDs compared to those who had access to multiple sources of information. Table 9. shows the C results for H 3.

- **Correlation (C)**

Hypothesis 3 (H3) suggests that patients who have access to multiple sources of information on herbal medicine are more likely to use herbal medicines than those who rely on a single source of information. To test this hypothesis, a correlation analysis to examine the relationship between the number of sources of information on herbal medicine and the likelihood of using herbal medicines to manage chronic diseases is conducted. The correlation analysis allows us to explore whether there is a relationship between these two variables and the strength of this relationship.

Table 9: Correlation (C) results for H 3

		UHM	AMSI
Pearson Correlation	UHM	1.000	.787
	AMSI	.787	1.000
Sig. (1-tailed)	UHM		.000
	AMSI	.000	

The correlation coefficient between UHM (Use of HM) and AMSI (Attitudes towards Medicines and Supplements Information) is 0.787, which indicates a "strong positive relationship between the two variables". The p-value of .000 for both variables suggests that this correlation is statistically significant at the 0.05 level. Therefore, it is concluded that there is a significant positive relationship between the use of HM and attitudes towards medicines and supplements information, and patients who have positive attitudes towards medicines and supplements information are more likely to use HM.

4.3.4 Hypothesis 4 (H 4):

"Patients who perceive herbal medicines as more natural and safer than conventional medicine will be more likely to use herbal medicines for chronic diseases."

To test the hypothesis that patients who perceive HM's as more natural and safer than conventional medicine will be more likely to use HM's for CDs, a regression analysis and correlation were conducted. The independent variable in this analysis is the patients' perception of HM's as more natural and safer than conventional medicine, and the dependent variable is their likelihood to use HM's for CDs.

- **Regression (R)**

The regression analysis will be used to test the relationship between the perception of HM's as natural and safe and the likelihood of using HM's for CDs. The analysis will involve estimating the parameters of a regression equation that best predicts the outcome variable (use of HM's) based on the predictor variable (perception of HM's as natural and safe). Table 10. R results for H 4.

Table 10: R results for H 4

	SS	df	MS	F	Sig.
Regression	96.926	1	96.926	287.370	.000[b]
Residual	201.696	598	.337		
Total	298.622	599			

- **Correlation (C)**

In the case of Hypothesis 4, the correlation analysis to examine the relationship between the variables "UHM" (perception of HM's as natural and safe) and "PS" (likelihood to use HM's for CDs). A strong positive correlation between these variables would support Hypothesis 4, as it would suggest that patients who perceive HM's as more natural and safer are more likely to use them for CDs. On the other hand, a weak or negative correlation would not support the hypothesis. Table 11. shows the C results for H 4.

Table 11: C results for H 4

		UHM	PS
Pearson Correlation	UHM	1.000	.570
	PS	.570	1.000
Sig. (1-tailed)	UHM		.000
	PS	.000	

The correlation coefficient between UHM and PS is 0.570, which indicates a moderate positive correlation between the two variables. The p-value is less than 0.05, suggesting that the correlation is statistically significant. This means that as the level of UHM use increases, the likelihood of using PS also tends to increase. However, the strength of the correlation is not as strong as some of the other correlations observed in this study.

5. DISCUSSIONS

Based on the regression and correlation analyses, it can be concluded that all four hypotheses have significant associations with the likelihood of using HM's for CDs. For Hypothesis 1, the regression analysis showed a "significant positive relationship between the length of time since diagnosis and the likelihood of using HM's". This suggests that patients who have been living with CDs for longer periods are more likely to turn to HM's as a complementary or alternative therapy. The correlation analysis also supported this hypothesis, indicating a moderate positive correlation between the variables. Hypothesis 2 was also supported by the results, with both regression and correlation analyses showing a significant positive relationship between having a family history of using HM's for CDs and the likelihood of using them oneself. This suggests that family history plays a role in shaping attitudes towards HM use and can influence patient behaviour. For Hypothesis 3, the regression analysis demonstrated a "significant positive

relationship between the number of sources of information on HM and the likelihood of using them". This suggests that having access to multiple sources of information, such as family, friends, and healthcare professionals, can increase patients' knowledge and awareness of HM's, which in turn can influence their decision to use them. The correlation analysis also supported this hypothesis, indicating a moderate positive correlation between the variables. Lastly, Hypothesis 4 was supported by both regression and correlation analyses. Patients who perceive HM's as more natural and safer than conventional medicine were found to be more likely to use them for CDs. This suggests that patient attitudes and beliefs about the safety and efficacy of HM's play a crucial role in their decision to use them as a complementary or alternative therapy. The results suggest that various factors, including length of diagnosis, family history, access to information, and attitudes towards HM, can influence the likelihood of using HM's for CDs. Healthcare professionals should take these factors into consideration when discussing treatment options with patients and provide accurate information about the potential benefits and risks of HM use.

6. CONCLUSIONS

This study provides valuable insights into the commonness, patterns, and features related with herbal medicine use among patients with chronic diseases in Malaysia. The findings reveal that a significant proportion of patients with chronic illnesses use herbal medicines as a complementary or alternative treatment to conventional medicine. The most commonly used herbal remedies include ginger, garlic, and turmeric, and patients use herbal medicines for various reasons, including to supplement their conventional medications, relieve symptoms, and improve overall health. The study also identifies several factors associated with herbal medicine use, including demographic factors such as age, gender, and education level, as well as clinical factors such as disease severity and duration. Additionally, the study found that patients who used herbal medicines were more likely to have positive attitudes towards them and believed that they were effective in treating their chronic illnesses. These findings highlight the need for healthcare professionals to be aware of the prevalence of herbal medicine use among patients with chronic diseases and to understand the factors that influence their use of these remedies. This knowledge can inform the development of interventions aimed at promoting safe and effective use of herbal medicines and improving communication between patients and healthcare providers regarding their use. Further research is needed to explore the potential interactions between herbal medicines and conventional medications and to investigate the safety and efficacy of commonly used herbal remedies among patients with chronic diseases in Malaysia.

DECLARATIONS:

ETHICS APPROVAL

No ethics approval is required.

HUMAN AND ANIMAL ETHICS:

Not Applicable.

DECLARATION OF INTERESTS

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

DATA AVAILABILITY STATEMENT

Data sharing is not applicable to this article as no datasets were generated or analysed during the current study.

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