ORIGINAL ARTICLE

Knowledge, Attitude, Usage Types, and Factors Affecting Dietary Herbal Supplements' Usage Pattern among Chronic Disease Patients

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Abstract

Aim: This study aimed to assess knowledge, attitude, usage and factors affecting dietary herbal supplements' usage pattern among chronic disease patients. **Materials and Methods:** A cross-sectional study was conducted among patients with chronic diseases. This study was conducted using a pre-validated, self-administered questionnaire, designed after an extensive literature review. **Results and Discussion:** Out of total 134 patients, 120 (89.6%) were males while 14 (10.4%) were females. Our studied patients had very good knowledge about dietary herbal supplements usage (mean knowledge score 7.8 (±3.45)) and majority had relatively positive attitude 103 (76.9%) toward dietary herbal supplements usage. This study found a strong positive correlation between the knowledge and attitude scores ($r = 0.903$, $P = 0.011$). Elderly, males, high-income and patients suffering from comorbidities had higher knowledge and positive attitude scores compared to the rest ($P < 0.05$). The study's findings showed that the majority of the patients with chronic illnesses used ginger 41 (13.1%), mint 35 (11.2%), fennel 34 (10.9%), and anise 34 (10.5%) as dietary herbal supplements. **Conclusion:** The good knowledge and moderate to strong attitude toward dietary herbal supplements still emphasized the role of healthcare providers especially clinical and hospital pharmacists to increase awareness about the benefits of dietary herbal supplements among the chronic disease patients suffering from multiple comorbidities.

Key words: Distress, warfarin therapy, Vitamin K, uncontrolled INR, PSS 10

INTRODUCTION

Chronic diseases such as diabetes mellitus, cardiovascular, respiratory, and renal diseases are the most prevailed diseases affecting patients from all over the world. High death rates are associated with having one or more comorbidities along with any chronic diseases and this is considered as one of the leading causes of death over the past 15 years. It is estimated that more than 50% of deaths result due to these chronic diseases worldwide.[1-4] Dietary herbal supplements are used to treat a variety of diseases, such as cancer, cardiovascular diseases, diabetes mellitus, anxiety, and depression.[1-4] Although the general populace does utilize dietary herbal supplements, however patients with chronic illnesses are also more prone to do so than the general population. According to research in 2018, around 70% of chronic illness patients used dietary herbal supplements.[5] Another different study conducted in 2018 on diabetes mellitus patients, found that approximately 30% of the patients used dietary herbal supplements. This study reported that the majority of the patients used honey, black seeds, fenugreek, and myrrh.[6] According to another study, more than 30% of patients with chronic liver disease

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also utilized dietary herbal supplements.[7] Furthermore, a study done in 2015 discovered that more than 25% of the patients with neurological problems had used dietary herbal supplements.[8]

Health-care professionals must therefore gain a better understanding of the prevalence of dietary herbal supplements use and ask and counsel patients about any potential side effects, drug interactions, or adverse events of the dietary herbal supplements if patients are taking them with other pharmaceutical agents. The widespread use of dietary herbal supplements also increases the risk of adverse events and drug interactions.[6-9] Undeniably, over time conventional pharmacotherapies for chronic diseases like cardiovascular disorders, such as beta blockers, angiotensin-converting-enzyme inhibitors, calcium channel blockers, and many other classes with proven efficacy in the alleviation of cardiac disease states were established. Unfortunately, they are associated with undesirable side effects and adverse reactions which also adversely affect patients' overall health state.[7-10] Hence, the need for dietary herbal supplements is emerging due to their synergistic effects when used with evidence-based prescribed therapies.

The majority of dietary herbal supplements are also present naturally inside of the human body and are essential for normal body growth and appropriate and smooth blood circulation.[11] Conversely, non-herbal dietary supplements, such as omega-3 fatty acids, coenzyme Q10, glucosamine sulfate, chondroitin sulfate, chromium, gamma-hydroxybutyrate, dehydroepiandrosterone, and s-adenosyl-l-methionine. The majority of these non-herbal dietary supplements have also been used in several studies to treat chronic diseases for four decades.[12] The major therapeutic roles of dietary herbal supplements in chronic disease patients are to aid in energy production inside body and help and protect smooth functioning of blood vessels as well as to act as antioxidants to neutralize harmful free radicals often produce among such patients. In literature fewer studies are evident which determined and investigated the benefits of dietary herbal supplements among chronic disease patients. Some studies have shown that dietary herbal supplements play a role in improving treatment outcomes and may prolong survival among patients using them.[11-13] According to a study, dietary herbal supplements were recommended to be taken daily along with other routine medicines in order to improve disease state and blood circulation among cardiac patients.[12,13] There is a greater scarcity in literature regarding dietary herbal supplements' apt usage among chronic disease patients suffering from various chronic diseases, especially in terms of their knowledge, attitude, and practice. This study was especially designed to investigate knowledge, attitude, and usage pattern among chronic disease patients. This study further evaluated various factors affecting dietary herbal supplements' usage patterns among chronic disease patients.

MATERIALS AND METHODS

Study design

This was a cross-sectional study done among patients suffering from various chronic diseases.

Study inclusion and exclusion criteria

The study subjects were screened for inclusion and exclusion criteria with the aid of an integrated computerized system of patients' records. At first, information sheet was handed-over to the patients and informed consent was taken. The questionnaire was delivered personally to the patients by the research team who also collected them back after their completion.

Sampling technique

The convenient sampling method was used to obtain the required sample size.

Sample size calculation

The sample size was calculated according to the below formula,

$$Z2 \times (p) \times [(1\text{-}p)/C2]$$

Where Z is the standard normal distribution = 1.96 at a 95% confidence interval; p is the hypothesized proportion of outcome of interest and C is the acceptable allowable error of 0.05. A total of 169 patients were initially approached for this study and among them, 134 patients were selected based on inclusion and exclusion criteria.

Study research tool

A pre-validated, self-administered research tool was used to obtain the desired data. This research tool was adopted and modified after extensive literature review with the help of previous studies. The tool had five parts to assess demographics, knowledge, attitude, usage type, and pattern of dietary herbal supplements among the studied patients. The first part of the study tool assessed socio-demographic, clinical and patient reported characteristics of the participants such as age, gender, educational level, income, occupation, comorbidities, number of chronic diseases, and types of chronic diseases.

The second part had 10 multiple-choice questions that assessed participants' knowledge about dietary herbal supplements. Scoring of the knowledge part of the research tool was done according to a previously published study whereby each correct answer was given a

score of 1 and each wrong answer was given a score of 0. The knowledge score was interpreted as good, moderate, and poor knowledge. For correct scores of 7 or higher, a good level of knowledge was assigned. For scores from 4 to 6, a moderate level of knowledge was assigned and for scores of 3 correct answers or below, a poor level of knowledge was assigned. The third part assessed the attitude of patients about dietary herbal supplements usage. It was done using 10 questions on a 5-point Likert scale. Each statement ranged from "strongly agree," "agree," "neutral," "disagree" and "strongly disagree" and scored as (strongly disagree = 1, disagree = 2, neutral = 3, agree = 4, strongly agree = 5). Scores were summed and a total score was obtained for each patient. The mean score was calculated and positive attitude was interpreted for scores equal or more than the mean. Scores below than mean score were interpreted as negative attitude toward dietary herbal supplements usage. The fourth part of the research tool was about patients' practice of usage of dietary herbal supplements. Questions assessed indication of usage, product recommendation, brand of non-herbal dietary supplements, dose taken, cost paid, and any side effect they had while using the dietary herbal supplements. The fifth part of the study tool was about usage type of the dietary herbal supplements among the studied patients. The recommendation of usage, frequency of usage, names of the dietary herbal supplements, timings of the usage, either with the pharmacological medicines or alone usage etc.

Cronbach's alpha which is the most common tool to measure the internal consistency of a research tool was also used to ascertain the reliability of our study research tool. Cronbach's alpha value for part II was 0.875, part III 0.873, part III 0.927, and part IV 0.933. The obtained values of Cronbach's alpha showed that the reliability of the research tool was established.

Statistical analyses

All data were analyzed using Statistical Package for Social Sciences software (version 25). Normality of the data was checked (kurtosis of normally distributed data falls between +2 and −2).[13] Normally, distributed data were presented in mean and standard deviation. Categorical data were presented as frequencies and percentage. For correlation between knowledge and attitude, Pearson correlation test was used. Independent t-test and one-way analysis of variance were also used to determine whether there were any statistically significant differences between the means of two, three or more independent groups/ variables. Chi-square test for univariate analysis and multiple logistic regression test for multivariate analysis were also used to determine the pure factors affecting usage pattern of the dietary herbal supplements among the studied patients.

RESULTS

According to the obtained study results, out of total 134 patients, 120 (89.6%) were males while 14 (10.4%) were females. This shows that the majority of the patients were males. The mean age (±SD) of the respondents for this study was 58.51 (±8.531) years. Non-elderly patients, (considering elderly age to be over 60 years old),[14] were the majority of the study subjects. The major proportion of the study subjects received secondary education, and was diagnosed with various chronic diseases. These results are presented in Table 1.

The mean (±SD) knowledge score was very good i.e., 7.8 (±3.45) with the maximum score of 10. The majority of the study subjects 68 (50.7%) had good knowledge level, and 35 (26.1%) had moderate knowledge. And 31 (23.1%) of the study subjects had poor knowledge about dietary herbal supplements and their usage pattern. These results are presented in Table 2.

In univariate analysis, there was a statistically significant difference ($P < 0.05$) observed in four variables regarding knowledge mean score and dietary herbal supplements usage. These variables were age (years), gender, comorbidities, and monthly income of the study subjects. These results are presented in Table 3.

The mean (±SD) attitude score toward dietary herbal supplements usage among the studied patients was 47.7 (±2.44). Most of the study subjects had positive attitude toward dietary herbal supplements usage. These results are presented in Table 4.

In univariate analysis, there was a statistically significant difference ($P < 0.05$) observed in three variables regarding attitude score (with moderate to strong positive correlation) and dietary herbal supplements usage. These variables were age (years) (moderate positive correlation, $r = 0.523$), gender (strong positive correlation, $r = 0.709$), and comorbidities (weak positive correlation, $r = 0.444$). These results are presented in Table 5.

This study also revealed a statistically significant ($P = 0.011$) strong positive correlation ($r = 0.903$) between knowledge score and attitude score, implying that knowledge level increases with the increase in attitude. This can also be said that with increase in knowledge, attitude of the dietary herbal supplements users becomes positive. The results are reported in Table 6.

Among the total studied 8 variables, as shown in Table 1, only 2 variables showed statistically significant association ($P < 0.05$) in multivariate analysis. In multivariate analysis, gender, and comorbidities were found to be the pure factors affecting usage of dietary herbal supplements among the studied chronic disease patients. These results are presented in Table 7.

The study's findings showed that the majority of the patients with chronic illnesses used ginger 41 (13.1%), mint 35 (11.2%),

Table 1: Sociodemographic and clinical characteristics of patients (*n*=134)

Characteristics	*n* (%)	Mean (±SD)
Age (years)		
Elderly (≥60 years)	71 (53.0)	58.51 (±8.531)
Non-elderly (<60 years)	63 (47.0)	
Gender		
Male	120 (89.6)	
Female	14 (10.4)	
Highest education		
≤Primary	25 (18.7)	
≥Secondary	109 (81.3)	
Monthly income		
≤$500	68 (50.7)	
$501–$1000	33 (24.6)	
$1001–$1500	23 (17.2)	
≥$1501	10 (7.5)	
Employment/Job		
Professional	54 (40.3)	
Technical	28 (20.9)	
Clerical	11 (8.2)	
Self-employed	10 (7.5)	
Unemployed	16 (11.9)	
Pensioner	15 (11.2)	
Comorbidities		
Yes	121 (90.3)	
No	13 (9.7)	
Number of chronic diseases		
≤2	83 (68.6)	
≥2	38 (31.4)	
Types of chronic diseases		
DM	57 (25.8)	
CVS	43 (19.5)	
GIT	39 (17.6)	
Respiratory	22 (10.0)	
Renal	21 (9.5)	
Ortho	17 (7.7)	
Cancer	13 (5.9)	
CNS	9 (4.1)	

fennel 34 (10.9%), and anise 34 (10.5%) as dietary herbal supplements. These findings are presented in Figure 1.

DISCUSSION

According to the obtained study results, elderly patients were comprised of 53% of the total study subjects, which

Table 2: Knowledge score of patients about dietary herbal supplements

Characteristics	*n* (%)	Mean (±SD)
Knowledge score		7.8 (±3.45)
Good (≥7)	68 (50.7)	
Moderate (4–6)	35 (26.1)	
Poor (≤3)	31 (23.1)	

Table 3: Knowledge toward dietary herbal supplements (univariate analysis)

Age (years)	*n*	Mean (±SD)	*P*-value*
Elderly (≥60 years)	71	5.13 (±1.98)	0.013[a]
Non-elderly (<60 years)	63	2.34 (±1.71)	
Gender			
Male	120	5.21 (±3.45)	0.047[a]
Female	14	4.61 (±2.43)	
Comorbidities			
Yes	121	5.12 (±3.43)	0.036[a]
No	13	3.98 (±4.07)	
Monthly income			
≤$500	68	5.98 (±1.82)	0.025[b]
$501–$1000	33	5.34 (±3.55)	
$1001–$1500	23	4.58 (±2.63)	
≥$1501	10	2.59 (±3.59)	

[a]Independent-samples t-test. [b]One-Way analysis of variance test. *$P<0.05$ shows significance

Table 4: Attitude score of patients about dietary herbal supplements

Attitude	Frequency (%)	Mean (±SD)
Positive (≥47.7)	103 (76.9)	47.7 (±2.44)
Negative (<47.7)	31 (23.1)	

was very probable and expected because age is known as one of the main risk factors of almost all types of chronic diseases.[14,15] In aging, symptoms of various chronic diseases especially cardiovascular diseases often start to appear due to weaknesses in body muscles especially in cardiac muscles where blood vessels become less flexible, making it harder for blood to move easily and difficulty in contractions and blood pump. In addition, poor nutrition, less exercise, tobacco smoking, and other chronic comorbidities like diabetes mellitus can further increase the risks of getting these diseases more severe.[16] Similarly, among non-elderly patients which were 47% in this study situation was not very different. This was not because of aging or comorbidities but maybe due to sedentary lifestyles which are very common these days. Adults are also speedily getting diagnosed with numerous chronic diseases due to their sedentary life styles and unbalanced diets (high in junk foods and less in fiber

and nutrients).[17] Several published studies reported that men are 3–4 times more likely to have various chronic diseases especially cardiovascular diseases than women due to gender differences in psychosocial and behavioral risk factors.[18]

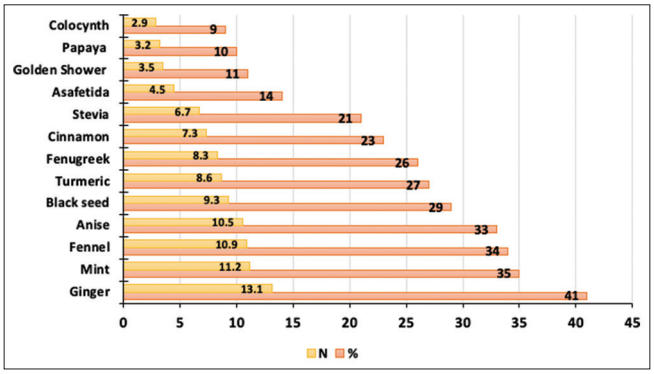

Figure 1: Types and frequency of dietary herbal supplements usage among the patients

Table 5: Attitude toward dietary herbal supplements usage (univariate analysis)

Characteristics	Attitude score	*P*-value*
Age (years)		
Elderly (≥60 years)	0.523	0.022[c]
Non-elderly (<60 years)		
Gender		
Male	0.709	0.008[a]
Female		
Comorbidities		
Yes	0.444	0.028[c]
No		

[a]Independent-samples t-test. [c]Pearson correlation test. **P*<0.05 shows significance

Table 6: Correlation between knowledge and attitude score

Characteristic	Attitude score*
Knowledge score	0.903[c] (0.011)

[c]Pearson correlation test. **P*<0.05 shows significance

This study showed that the knowledge of patients about dietary herbal supplements was good although there is a misconception about herbal products and dietary supplements among the general public regarding their adverse events and side effects. However, most of the study individuals were interested in receiving additional information about dietary herbal supplements and their usage. Furthermore, patients had good to moderate knowledge regarding dose, cost, side effects, adverse reactions, and evidence-based health benefits of the dietary herbal supplements in chronic diseases. The majority of the patients had a history of cardiovascular diseases and diabetes mellitus as comorbidities. Cardiovascular diseases are among the leading causes of mortality, which usually account for 25% of all deaths, all over the globe due to other chronic diseases.[19,20] The majority of study subjects that consumed dietary herbal supplements revealed that the reason for taking dietary herbal supplements was their existing chronic diseases and the comorbidities. All of the study subjects did not experience any major side effect while using dietary herbal supplements. As a fact, older patients tend to take more supplements than youngers, thus resulting in a higher knowledge level. In our study, the use of dietary herbal supplements was higher among elderly patients and they were shown to be well-educated about their supplements' usage pattern, dose, and frequency.[21]

This study showed a statistically significant difference in knowledge level according to monthly income which can be due to the affordability of dietary herbal supplements in high-income subjects. In addition to that, males, the elderly, educated, high-income, and improved lifestyle patients, often used multivitamins and minerals supplements more often than others. These findings were in line with another study done in the United States where the authors reported similar results.[21-23] The results of this study also showed that male patients and patients with comorbidities consumed more dietary herbal supplements than the rest of the patients. Most of the study subjects revealed moderate to strong positive attitude toward

Table 7: Factors affecting usage of dietary herbal supplements (multivariate analysis)

Variables	β	S.E.	AOR	95% CI		*P*-value
				Lower	Upper	
Gender						
Female (referent)						
Male	0.329	0.553	3.729	2.213	5.432	0.021
Comorbidities						
No (referent)						
Yes	0.498	0.442	2.117	2.488	4.731	0.042

AOR: Adjusted odds ratio, CI: Confidence interval

dietary herbal supplements usage. This maybe because knowledge often influences behavior through attitudes. Elderly patients showed more positive attitude than the non-elderly patients because older patients tend to consume more dietary herbal supplements than younger patients, thus resulting in a more positive attitude.[21-24] Knowledge level increases with the increase in attitude score. This can be understood that the more knowledgeable patients have more positive attitude toward dietary herbal supplements usage. Patients with increased knowledge about dietary herbal supplements tend to consume more dietary herbal supplements.[22-24]

Historically, ginger has been used to cure a number of conditions, such as arthritis, motion sickness, nausea, and vomiting.[23-25] Since mint possesses antispasmodic qualities, it has long been used as a digestive aid. For many years, non-ulcer dyspepsia and irritable bowel syndrome have also been treated with mint oil. Furthermore, a number of research have shown that people frequently inhale mint leaf steam to relieve upper respiratory tract issues and cough.[26-28] However, colic, diarrhea, bloating, and bowel spasms have also been treated with fennel and anise.[26-28] Numerous investigations have documented a comparable trend of use of numerous dietary herbal supplements, such as ginger, mint, and fennel.[28-30] Most of the participants in our study felt that the dietary herbal supplements they took orally had potent healing properties and that using them didn't require a prescription from a licensed healthcare professional. Similar results were also noted in another study, wherein over 80% of participants thought that dietary herbal supplements were safe and beneficial to their health.[31] Because the dietary herbal supplements were natural or herbal goods, our study participants also felt that they had potent healing effects and posed no risks. Our study's findings also showed that patients who used dietary herbal supplements thought they were easier to get than prescription drugs or other items, and that they had fewer side effects. It's interesting to note that while just a small percentage thought dietary herbal supplements would have some negative effects similar to those of pharmaceutical medications, conversely some of them also thought they were superior to therapeutic pharmaceuticals.

Two factors (after adjusting confounders) were found to be associated with the use of dietary herbal supplements among the studied patients suffering from chronic diseases. First pure factor was gender, which showed a statistically significant association (P = 0.021) regarding the use of dietary herbal supplements among the studied patients, whereby male patients were found to use more dietary herbal supplements than the female patients with the odds of 3.729. Second factor (without confounders) was the presence of comorbidities which also showed a statistically significant association (P = 0.042) regarding the use of dietary herbal supplements among the studied cohort of the chronic disease patients. The usage of dietary herbal supplements was significantly increased among the patients with multiple comorbidities. Patients suffering from more comorbidity were found to use more dietary herbal supplements than the less comorbid patients with the odds of 2.117. Previous studies have also reported findings that males tend to use more dietary herbal supplements,[32,33] and patients with comorbidities are among the substantial and frequent users of dietary herbal supplements.[34] More attention is needed for these specific populations to avoid any unwanted adverse effects.

Most of the study subjects stated that their friends or family members recommended them to consume various dietary herbal supplements. This was to be expected as the prescribing trends of dietary herbal supplements were lower by the prescribers in this population. Since dietary herbal supplements were not provided in public hospitals as a therapeutic agent, this also led to the low usage of the dietary herbal supplements which can be considered as a limitation of the study. Apart from that, since this study only collected data from a single study site, it may not reflect the knowledge, attitude and pattern of use of dietary herbal supplements on a larger scale.

CONCLUSION

This study concluded that most chronic disease patients suffering from various comorbidities had good knowledge about dietary herbal supplements usage and relatively a positive attitude toward their benefits. Hence, there was a positive correlation found between patients' knowledge and their age. Gross monthly income level was also positively associated to the knowledge level. In addition, more positive attitude was reported among older patients. These findings also indicate the necessity of a comprehensive education program targeting not only chronic disease patients suffering from various comorbidities but also healthcare providers to improve their awareness about the potential benefits of complementary and alternative medicine in general and about dietary herbal supplements in particular. Health care professionals especially pharmacists should also improve their knowledge and attitude which will increase their confidence in apt counseling about the use of dietary herbal supplements among chronic disease patients.

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