

# Users' Perception of Herbal Medicine in Bangladesh

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## ABSTRACT

**Purpose:** The research studied the users' perception regarding different aspects of herbal medicine in Bangladesh. It provides the popularity, availability and affectivity of herbal medicine that would benefit both the consumer and the manufacturer.

**Methodology:** The empirical study made use of primary data collected through a structured questionnaire that measured users' perception regarding 19 specific aspects of herbal medicines. By using convenient sampling technique 157 herbal medicine users are interviewed.

**Findings:** The study noted that the herbal medicine users prefer herbal medicine over other medicines, believed to use it in future, refer herbal medicine to others, and use it for chronic diseases. They witnessed that the herbal medicine has fewer side effects, made of natural ingredients, and is comparatively cheaper. They noted that the herbal products are easily available and accessible. They happily use it for common diseases and feel that the medicines should be available in public pharmacies. The users opined that the herbal medicine meet their expectations, makes fast recovery, as well as content with the knowledge of the practitioners.

**Practical Implications:** The research gave insight about the marketability, popularity, and customer retention regarding herbal medicine. The overall positive perception signifies an opportunity for the marketers of herbal medicine in Bangladesh.

**Originality:** Herbal medicine is a globally recognized medication formula. The practice of herbal medicine in Bangladesh is deeply rooted, consistent with our culture, and has flourished vastly. This study is a value-addition in this field.

**Limitations:** The absence of sample frame made it a little difficult to choose the respondents. Also, accessibility is a problem in the study.

## 1. Introduction

### 1.1 Background

Herbal medicines are naturally produced with plant-derived substances with minimal or no industrial processing used to treat illness within local or regional healing practices. Herbal medicines are getting significant attention globally (Dubey, Kumar, & Tripathi, 2004). The practice of herbal medicine is profoundly rooted in the cultural legacy of Bangladesh and the people of the country. Herbal medicines have been used here as an essential means of treatment of diseases and healing of several health problems since ancient times. Recently, the practice of herbal medicine, along with modern medicine, in this country has flourished vastly (DCCI, 2007). Even at this age of highly advanced allopathic treatment, about 75% of the rural and semi-urban population of Bangladesh, still prefers to use herbal medicine for the treatment of most of their diseases. Even though modern medical facilities may be available in the neighborhood, these people mostly resort to herbal medicine (Boparai, et al., 2017, Clement, et al., 2005).

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However, the concept, practice, type, and method of usage of herbal medicine vary widely among different groups living in different locality (Kennedy, 2005). This happens according to the culture, living standard, economic status, religious belief and education (Gardner et al., 2000). Consequently, herbal medicine practice in Bangladesh includes the combination of most primitive forms of folk medicine<sup>1</sup>, as well as, the modernized Unani<sup>2</sup> and Ayurved<sup>3</sup>. Such various aspects of herbal medicine practice and their acceptability, recognition, satisfaction, etc., in the country as a means of use, treatment, practice and medication are described and discussed, supported by documentary evidences from of users, in this study.

The usage of herbal medicine is burgeoning globally. Herbal medicines have had their presence since age-old time. According to findings from several researches, it is noted that over 80% of the population in developing countries is thought to be dependent on traditional healing modalities, including herbal remedies, for health care and therapy (MHRA, 2009). Although various studies acknowledged the increasing occurrence of herbal use throughout the world, only a few conveyed how patients perceived the efficacy of this healthcare modality in specific diseases. In these researches, herbal remedies were not conceived as an entity on its own, but as a sub-class of complementary and substitute medicines.

The efficacy of many herbal treatments has not been demonstrated much. Herbal medications mostly bank on anecdotal evidence for reports of success rather than go through several processes of medical trials. Herbal medications can be misused, overused and abused. Such medicines should only be used in suggested quantities and with consent of a physician (MHRA 2009). The growing popularity of herbal remedies requires further study to determine the probable factors driving this burgeoning phenomenon. It is perceived that one of the major factors contributing to the increasing popularity of herbal medicines is the observation that herbal remedies work well. This favorable efficacy would support continued practice simultaneously with conventional allopathic medicines. This study was designed to assess the usefulness of herbal medicines in comparison to physician-prescribed conventional medicines and/or herb-drug combinations.

From a consumer's point of view, the research will provide with the opportunity of knowing the popularity, availability and affectivity of herbal medicine and will benefit both the consumer and the manufacturer of herbal medicine. From a producer's point of view, the research will give insight about the marketability, popularity and customer retention regarding herbal medicine. Makers will also be able to determine the customer satisfaction and the trustworthiness of herbal medicine among the consumers. The results will also influence those who want to industrialize this growing field. Another prospective aspect is the institutionalization of herbal medicine which might attract academics and law makers. Overall, the results obtained from the research will provide us with an opportunity to know the current market situation and the future prospects of herbal medicine in Bangladesh.

## **1.2 Objective**

The broad objective of the study is to explore the herbal medicine users' perception regarding different aspects of herbal medicine in Bangladesh. Specifically, this study looked into a) the customer retention (customer's tendency to stick to using herbal medicine), b) the comparative

advantages of herbal medicine, c) the availability of herbal medicine, d) the consumer satisfaction level of herbal medicine usage, and e) the reasons behind using herbal medicine.

## **2. Literature Review**

### **2.1 Herbal Medicine and Its Scope and Limitations**

For centuries people have used herbal plants for healing in every parts of the globe. Herbal medicine - also termed botanical medicine or phytomedicine - uses plants' seeds, berries, roots, leaves, bark, or flowers for medicinal purposes. To provide positive support of various biological systems herbal medicine also use purified plants' water or solvent extracts, essential oils, gums, resins, exudates, etc. Herbalism has a long tradition of use outside of conventional medicine. It is becoming more mainstream as improvements in analysis and quality control along with advances in clinical research show the value of herbal medicine in the treating, curing and preventing diseases (Weiss & Fintelmann, 2000).

Traditional herbal medicines are naturally occurring, plant-derived substances with minimal or no industrial processing that have been used to treat illness within local or regional healing practices. With increasing concern of the side effects of allopathic medicine, medicinal research seems to allege herbal medicines to be the alternative resolution. This interest in herbal drugs is due to a) ineffective therapy and abusive use of conventional medicine, b) incorrect use of synthetic drugs results in side effects and other problems, c) accessibility and convenience problem of conventional pharmacological treatment to a large share of the global population, and d) believe that folk medicine and natural products are harmless (Raghavendra et al., 2009).

But, the common belief that herbal drugs are very safe and free from side effects is not factual. Well controlled clinical trials now confirm that adverse effects really exist (Smet, 1995; Brown, 1992). Plants have some very toxic constituents. These noxious contaminants may arise due to a) environments and conditions where the medicinal plants are grown or collected, b) conditions under which they are dried and processed, c) storage conditions and conditions during transport, and d) manufacturing processes when the medicines are produced. Nonetheless, when the drugs are used properly the adverse effects of most herbal drugs are relatively less recurrent compared to synthetic drugs.

### **2.2 Global Market and Growth of Herbal Medicine**

Over decades, there has been growing interest in alternative therapies and the beneficial use of plant derived natural products (Vulto & Smet, 1988; Akerele, 1993). About two-third of the world population, particularly in the developing countries, relies on non-conventional medicine in their primary healthcare as reported by the World Health Organization. In consumption market, Europe and Asia Pacific are the mainly consumption regions due to the bigger demand of downstream applications.

Worldwide market of herbal medicines is estimated to be around \$80 - \$100 billion at the beginning of the century and was expected to reach \$117 billion by 2024 driven by growing popularity of herbal therapeutics compared to conventional drugs (Mathur 2003). Kappauf et al., (2008) estimated, a decade ago, that the world market for herbal medicine, including herbal products

and raw materials to grow annually at a rate of 5-15%. Leaving behind all these estimation, today the global herbal medicine market is valued at \$158.31 billion (in 2020) and estimated to reach \$233.61 billion by the end of this decade, growing at a CAGR of 6.7%.

The market for herbal medicines and remedies is anticipated to record profitable growth due to their cost-effectiveness compared to allopathic ones. In the west, the demand for herbal drugs has reached a new high in recent years. Since 1999, the global market for herbal supplements exceeded \$62 billion, with a \$30.4 billion market in Europe, \$9.8 billion in Japan, \$ 10.4 billion in the ASEAN, \$ 6.9 billion in North America and others \$4.1 billion (Wakdikar, 2004). In India the value of botanicals related trade is about \$10 billion per annum with annual export of US \$1.1 billion (Yadav, 2019; Singh et al., 2003), while China's annual herbal drug production is worth \$48 billion with export of \$3.6 billion (Patwardhan, Warude, Pushpangadan, & Bhatt, 2006; Handa, 2004).

## **2.3 Herbal Medicine in Bangladesh**

### **2.3.1 Domestic Market of Herbal Medicine**

Domestic pharmaceuticals industry of Bangladesh comprises of allopathic, Ayurveda, herba /unani, homeopathic, diagnostic center, hospitals, pharmacies, bio-clinical, etc. In 2019, Bangladesh's pharmaceutical market was valued at \$3.1 billion and is forecasted to grow by 7.6% in 2020 and reach \$3.54 billion (Pharmexcil, 2020). Back in 2006, the total market size of pharmaceutical products was estimated about \$600 million, which was only \$350 million in the year 1998-99 (DCCI, 2007).

The herbal medicine market has been expanding gradually since 1980. The total value of the herbal products in Bangladesh, has increased from about \$53.62 million in 2003 to \$84.78 million in 2008 and growing at rates considerably higher than 10% growth rate for the allopathic products (DCCI, 2007). In 2016, Bangladesh has a market of about \$353 million worth of herbal or traditional products annually (BFTI, 2016, p.4). Total export value of medicinal plants from Bangladesh amounted to \$ 0.39 million and the export value of seeds, fruit and spores, for sowing stood at \$ 0.25 million in 2014-15. In total, the formally processed herbal medicine sector is worth approximately 10% of the pharmaceutical market. Since then, this sector is growing at a steady rate.

The fast growth in the Unani sector is believed to be fueled by the large number of trained Hakims, its simpler and faster production process and easier treatment courses than Ayurveda medicines. Conventionally, there is a common belief that herbal medicines do not have any side effect. A large majority of people living in rural Bangladesh are still customary in their attitude. This segment of people demands natural products for all kinds of diseases. So, there is large potential market for herbal products in Bangladesh.

### **2.3.2 Domestic Producers and Institutions of Herbal Medicine**

Earlier in Bangladesh, individual herbal doctors used to dominate the herbal medicine sector. In the face of growing popularity of allopathic medicines, the herbal practitioners have long been on the verge of disappearance. In their place, mass-production of herbal medicines have continued to emerge. A report by DGHS (2012) noted that in Bangladesh there are around 297 Herbal/Unani, 204 Ayurveda and some 77 homeopathic registered factories, employing collectively around 2,000 to

4,000 people. In addition, there are said to be 5,000 qualified and 80,000 unqualified herbal practitioners in the country. To encourage this sector Government of Bangladesh has established one Unani and Ayurveda degree college, 12 Unani diploma college and eight Ayurveda diploma college. As of 2012, the government has approved 156 positions for Unani medical officers, 156 positions for Ayurveda medical officers and 467 positions for herbal assistants. Except herbal assistants, most of the positions are vacant (DGHS, 2012, pp. 219-220).

Herbal medicines are now manufactured in large scale for commercial purpose by a number of manufacturers such as Sadhana Oushadhalaya, Sakti Oushadhalaya, Hamdard, Ayurvedya Pharmacy, etc. Hamdard Laboratories, a leading herbal medicine producer, occupied lion shares of herbal medicines market. Huge amounts of herbs are imported from different countries for annual production of Unani and Ayurveda medicines worth around \$11 million. Recently, more than 500 medicinal herbs species have been enlisted in Bangladesh. They have proven reach in diversified resources and habitats. Medicinal plants are also being cultivated by qualified researchers. Bangladesh Tea Board has planned to bring 1,000 hectares of land of tea gardens under medicinal tree plantation program.

Commercial manufacturing of herbal medicines in Bangladesh is done according to documented traditional systems developed by Unani and Ayurveda researchers. With WHO's official recognition and recommendation of herbal medicines, the local manufacturers are now more active. Recently, several pharmaceutical companies also expanded their production units for herbal medicine production. Jayson Pharmaceuticals, Renata Limited and ACME Laboratories have started its herbal unit with a few items. Another 10-12 items are in their research process.

### **3. Methodology**

The study made use of both primary and secondary data and pertinent literature review. The primary data was collected through interviews and questionnaire survey (physical and online) of users of herbal medicine in Bangladesh. The survey was conducted through a structured questionnaire to measure users' perception regarding 19 specific aspects of herbal medicines. The questionnaire was developed on the basis of a coordination schema specifying the parameter, complex variables, simple variables and values (Appendix 1). Convenient sampling technique was used to get the information from 157 herbal medicine users (at 95% confidence level, 9% precision and 50% proportion) as the population of the study is undefined and has no sampling frame. The respondents are mainly interviewed in 11 outlets of three major herbal medicine producers (i.e., Hamdard, Sadhona Oushodhaloy, and Shokti Oushodhaloy) in Dhaka. To make the sample representative, care was taken to balance gender, age, income, religion, education, hometown of the respondents. The study made use of statistical tools to analyze the data that include index analysis, t-test, z-test, ANOVA, correlation, factor analysis, regression.

### **4. Data Analysis and Findings**

#### **4.1 Sample Demography**

There are 157 respondents in the study. Of the total 157 respondents 61 (38.9%) were females and 96 (61.1%) males. The respondents are mainly from Dhaka division<sup>4</sup> of Bangladesh (43.9%)

followed by Chittagong (19.7%), Rajshahi (10.2%), Khulna (10.2%), Barisal (6.2%) and Rangpur (6.2%). Majority of the respondents are male (61.1%). Religion wise, the respondents are mostly Moslem (88.5%)<sup>5</sup> followed by Hindu (10.1%) and Christian (1.3%). The studied group is dominated by graduates and above (49.0%) followed by secondary and higher secondary certificate holders (22.3%), and postgraduates (20.4%). About 8.3% has below secondary level of education. The mean age of the respondents found to be 32.89 years with the range of 18-78 years ( $\sigma = 14.01$  years).

The average income of the group is around \$ 554/month ( $\sigma = \$951$ ), the income spread, ranges from \$35/month to \$8187/month and majority of the respondents earn less than \$235/month<sup>6</sup>. As noted, 75 respondents (47.8%) did not mention their income. They may be student, or their earning level is too low. The average duration of using herbal medicine for the respondent group is 17.4 months ( $\sigma = 39.61$  months); however, the duration of using the medicine ranges from as low as one month to as high as 300 months. Further it is observed that the average number of practitioners in the locality of the respondents are 2.69 ( $\sigma = 2.91$ ) and number of retailers are 3.64 ( $\sigma = 5.29$ ).

## 4.2 Consumers' Perception regarding Herbal Medicines

In the study, altogether 19 variables (18 specifics, 1 broad overall) were identified to explain the perception of herbal medicine users towards herbal treatment. Further, the 18 simple variable variables are grouped into five complex variables. All the specifics of the simple variables are drafted in a positive tone of the herbal medication. A 5-point Likert Scale is used to measure the responses (1: Strongly disagree, 2: Disagree, 3: Indifferent, 4: Agree, 5: Strongly agree). Analyses of simple, complex, and overall statistics are narrated below.

### 4.2.1 Simple Specific Variable Wise Consumer Perception

As noted, there are 19 simple variables (18 specific, 1 broad overall) to explain the perception of herbal medicine users towards herbal remedy. The mean index of each of them is found to be significantly above 3 (Indifferent) at 5% significance level except two (Table 1). It is also noted that in 16 out of 19 cases the mean indices are between 3 and 4 and only in three cases it is above 4. So, the specific satisfaction indices show positive perception of the respondents towards each of the attributes of the herbal medicine. Further, the mean of the 18 simple variables of all the responses is found to be positive (3.66). This is also supported by the users overall positive agreement to herbal medication (3.84).

It is further noted that the respondents ranked the following six as the most agreeable attributes ( $\mu \geq 3.75$ ): i) Made of natural ingredients (4.36), ii) Few side effects (4.11), iii) Necessary to be available in pharmacies (4.08), iv) Affordable price (3.85), v) Happy with decision to use (3.82) and vi) Suggest to others (3.76). Next important ones are ( $3.50 \leq \mu < 3.75$ ): i) Referred positively by someone (3.72), ii) Products met expectations (3.63), iii) Herbal practitioners are knowledgeable (3.61), iv) Prefer over other medicines (3.61), and v) Use in future illness (3.59). The least agreed ones are ( $3.30 \leq \mu < 3.5$ ): i) Cheaper than other medicines (3.49), ii) Available in close proximity (3.48), iii) Reasonable price (3.47), iv) Use for chronic disease (3.43), and v) Adequate number of sales/service centers (3.30). Following two variables are not significantly different from 3 (Indifferent) at 5% level: i) Use for common/regular disease (3.18), and ii) Leads to quick recovery than others (3.11).

**Table 1. Mean Index Values of the Variables**

Parameter	Complex Variables	Simple Variables	Mean
Aspects of Herbal Medicine (3.64)	a) Customer Retention ( $\mu = 3.56, \sigma = 0.861, \alpha = 0.000$ )	1) Use in future illness	3.59
		2) Refer/Suggest to others	3.76
		3) Prefer over other medicines	3.45
		4) Use for chronic disease	3.43
	b) Competitive advantage ( $\mu = 3.99, \sigma = 0.617, \alpha = 0.000$ )	1) Cheaper than other medicines	3.49
		2) Few side effects compared to others	4.11
		3) Produced from natural ingredients	4.36
	b) Accessibility & convenience ( $\mu = 3.51, \sigma = 0.815, \alpha = 0.000$ )	1) Available in proximity	3.48
		2) Adequacy number of sales/service centers	3.30
		3) Use for common/regular disease*	3.18
		4) Necessary to be available in pharmacies	4.08
	c) Satisfaction with the product & services ( $\mu = 3.54, \sigma = 0.877, \alpha = 0.000$ )	1) Products met expectations	3.63
		2) Happy with decision to use	3.82
		3) Leads to quick recovery than others*	3.11
		4) Herbal practitioners are knowledgeable	3.61
	d) Reason for use ( $\mu = 3.69, \sigma = 0.863, \alpha = 0.000$ )	1) Reasonable price	3.47
2) Affordable price		3.85	
3) Referred positively by someone		3.75	
Overallsatisfaction		1) Overall positive perception	3.84

Source: Authors Calculation

**4.2.2 Complex Variable Wise Consumer Perception**

As noted, the 18 simple variables are grouped into five complex variables: i) Customer retention, ii) Competitive advantage, iii) Accessibility & convenience, iv) Satisfaction with the product & services, and v) Reason for use. Further analysis regarding mean index of complex variables showed that (Table 1) the competitive advantage (3.99) is perceived to be the most emphasized one, followed by reason for use (3.69), customer retention (3.56), satisfaction with the product & services (3.54), and accessibility & convenience (3.51).

**4.2.3 Overall Response**

Overall, the respondents showed quite positive attitude towards the use of herbal medicine (3.84), where the mean index lies close to satisfied level (4). The finding led to the assumption that the perception of the herbal medicine users towards herbal medicine is positive but not strongly. Also the overall mean index is quite close to the mean of 18 simple variables (3.66). Hence, we can conclude that the responses are quite consistent and positive towards the herbal medicines.

**4.2.4 Measuring Similarity of the Different Broad Aspects with the Overall Perception**

A similarity test is conducted to see the statistical closeness of the overall perception compared with the mean indexes of five different complex variables (e.g., customer retention, comparative advantage, accessibility & convenience, satisfactions, and reason for use). For all the aspects, the values are showing higher than 96% similarity with the overall index value (Table 2).

**Table 2. Measuring Similarity of the Different Aspects with the Overall Perception**

Complex Variable	Index Value (Mean)	Overall Index Value	Similarity (%)
a) Customer retention	3.56	3.84	99.45%
b) Comparative rdvantage	3.99		97.50%
c) Accessibility & convenience	3.51		100.00%
d) Satisfaction with the product & services	3.54		98.64%
e) Reasons for use	3.69		96.04%

Source: Authors calculation

### 4.3 Consumers' Perception on Different Demographic Features

#### 4.3.1 Gender

The independent sample t-testis conducted to see if gender-wise there is any statistically significant difference between the mean responses of the two different population sat  $\alpha = 5\%$  (Appendix 2). In only four out of 19 cases the responses are found different at 5% level of significance. These include: i) cheaper than other medicines, ii) convenient to get, ii) reasonable price, iii) overall positive perception. In rest of the 15 cases there is no significant ( $\alpha = 5\%$ ) gender-wise difference is observed. Interestingly in each of the 19 cases the female respondents are found more agreeable to the herbal attributes than their male counterparts except the variable "Use for chronic disease", i.e., the female respondents are more agreeable to the positive aspects of herbal medicines. Overall, the female response ( $\mu = 4.19$ ) is more positive than the male respondents ( $\mu = 3.69$ ).

#### 4.3.2 Age

A significant ( $\alpha = 5\%$ ) relationship is observed in nine out of 19 cases between age and consumers' perception regarding the use of herbal medicines (Table 3). In all of the nine cases the correlation is negative except one. Thenine cases where there is significant relationship are: i) Use in future illness (-0.211), ii) Prefer over other medicines (-0.257), iii) Few side effects compared to others (+0.182), iv) Leads to quick recovery compared to others (-0.300), v) Available in close proximity (-0.194), vi) Adequacy number of sales/service centers (-0.376),vii) Use for regular disease (-0.274), viii) Reasonable price (-0.177) and ix) Referred positively by someone (-0.258). The correlation coefficients are found to be quite weak ( $+0.18 > r > -0.38$ ). Hence, we can conclude that with age the herbal medicine users become a little critical to the usefulness of the medicines.

**Table 3. Correlation between Simple Variables and Age**

Variable	r	Variable	r
1) Use in future illness**	-0.211	11) Happy with decision to use	-0.088
2) Suggest to others	-0.146	12) Herbal practitioners are knowledgeable	-0.091
3) Prefer over other medicines**	-0.257	13) Use for regular disease**	-0.274
4) Cheaper than other medicines	-0.097	14) Use for chronic disease	-0.035
5) Few side effects compared to others*	+0.182	15) Reasonable price*	-0.177
6) Leads to quick recovery compared to others**	-0.300	16) Affordable price	-0.027
7) Available in close proximity*	-0.194	17) Referred positively by someone**	-0.259
8) Adequacy number of sales/service centers**	-0.376	18) Produced from natural ingredients	+0.151
9) Necessary to be available in pharmacies	-0.022	19) Overall positive perception	-0.042
10) Products met expectations	-0.107		

\*correlation is significant at 0.01 level (2-tailed) \*\* correlation is significant at 0.05 level (2-tailed)

Source: Authors Calculation

### 4.3.3 Education

The study tried to find out if respondents from different education level have different perception regarding herbal medicines. The respondents are grouped into four educational levels: 1) Below Secondary (n = 13), 2) Secondary to Higher Secondary (n = 35), 3) Undergraduate (n = 77), and 4) Graduate (n = 32). An ANOVA test is run to see if there is any significant ( $\alpha = 5\%$ ) mean difference in responses among the groups. The results have shown that only in one case the mean of the group responses is significantly different (Prefer herbal medicines over other medicines). Regarding preference over other medicines, it is observed that the less educated ones prefer it more than the more educated ones (The mean indices of Below Secondary, Secondary to Higher Secondary, Undergraduate, and Graduate level respondents are 3.62, 3.74, 3.53, 2.88 respectively).

### 5. Factors Affecting the Users' Perception of Herbal Medicine

A factor analysis<sup>6</sup> conducted reduced the 18 simple variables into four factors with eigen value greater than one (Table 4). The factor analysis with 157 sample is found adequate ( $KMO = 0.852 \geq 0.5$ ) and valid (Bartlett's test of sphericity significance level 0.000). The communalities<sup>6</sup> of the variables that constituted the factors are found strong, indicating robust relationships among the variables (Appendix 3). As can be seen from the table, the four factors explain 62.30% of the variability. Also, it can be noted that the first factor (Satisfaction and retention of herbal products) appears to be the most important as it explains 36.03% of the variability. Other factors include "Reason for use" ( $\sigma^2 = 10.62\%$ ), "Accessibility & convenience" ( $\sigma^2 = 8.74\%$ ) and "Competitive advantage" ( $\sigma^2 = 6.92\%$ ). The following sections describe and analyze these factors in detail.

**Table 4. Factors, Eigen Value and Variance Explained by the Individual Factor**

Factors	Eigen value	Variance ( $\sigma^2$ ) (%)	Cumulative Variance (%)
1. Satisfaction and retention of herbal products	7.760	36.03	36.03
2. Reason for use	1.987	10.62	46.65
3. Accessibility & convenience	1.356	8.74	55.39
4. Competitive advantage	1.169	6.92	65.31

Source: Authors Calculation

**5.1 Factor 1: Satisfaction and Retention of Herbal Products ( $\sigma^2 = 36.03\%$ )**

It appears that satisfaction with herbal products is a very important factor in the eyes of the respondents as it explains 36.03% of the variability with six variables. Based on their responses, it may be deduced that the respondents are satisfied with their decision to use herbal products and herbal practitioners' knowledge. The products are also meeting their expectations. Other variables in this factor are mostly related to retention of the customers (Table 5). Mostly, the variables have high factor loadings<sup>7</sup>. This clearly shows the relative strengths of these individual variables. Therefore, satisfaction with herbal products is a very important factor as it has maximum variability, comprises of maximum number of the variables with consistency, and the variables have high factor loadings.

**Table 5. Satisfaction and retention of herbal products**

Item No	Variable Name	Factor Loading
1	Satisfaction with the decision to use herbal products	0.866
2	Meeting expectation	0.846
3	Satisfaction with practitioners' knowledge	0.739
4	Refer/suggest others for use	0.715
5	Use herbal medicine for future illness	0.590
6	Leads to faster recovery	0.529

Source: Authors Calculation

**5.2 Factor 2: Reason for use ( $\sigma^2 = 10.62\%$ )**

The second factor that has been identified is reason for use. It contains four variables and explains only 10.62% of the variability (Table 6). The variables under this factor are "Cheaper than other medicines", "Reasonable Price", "Affordable price", and "Referred positively by someone". Each of the variables has high factor loading indicating that they are strongly correlated with this factor.

**Table 6. Reason for Use**

Item No	Variable Name	Factor loading
1	Cheaper than other medicines	0.810
2	Reasonable price	0.782
3	Affordable price	0.767
4	Referred positively by someone	0.567

Source: Author's calculation

**5.3 Factor 3: Accessibility & Convenience ( $\sigma^2 = 8.74\%$ )**

The third factor accessibility & convenience contains five variables and explains only 8.74% of the variability. The variables included here are i) Adequacy of sales/service centers, ii) Use for regular diseases, iii) Available in proximity, iv) Prefer over other medicines, and v) Use for chronic diseases (Table 7). The factors have comparatively high loading except the last one (0.39). It appears that the herbal medicine sales and service centers are closely located and easy to access. This also shows their popularity.

**Table 7. Accessibility & Convenience**

Item No	Variable Name	Factor Loading
1	Adequacy of sales/service centers	0.823
2	Use for regular diseases	0.656
3	Available in proximity	0.619
4	Prefer over other medicines	0.591
5	Use for chronic diseases	0.390

Source: Authors Calculation

**5.4 Factor 4: Competitive Advantage (6.92%)**

The fourth and final factor competitive advantage explains only 6.92% of the variability and contains three variables. The variables are i) Few side effects, ii) Made of natural ingredients, and iii) Should be available in traditional pharmacies (Table 8). They are also quite strongly related with the factor.

**Table 8. Competitive Advantage**

Variable Code	Variable Name	Factor Loading
1	Few side effects compared to other types of medicines	0.752
2	Natural ingredients	0.585
3	Make available in traditional pharmacies	0.567

Source: Authors Calculation

**5.5 Regression Model with Four Factors**

A linear regression was run in enter method with four factors as independent variables and “overall Perception of herbal medicine” as dependent variable. The model has significant predictive capability as the model is found significant ( $\alpha = 0.000$ ) with a  $R^2$  adjusted value of 55.7%. Individual factor coefficients ( $\beta$ ) are also found significant at  $\alpha = 5\%$  (Table 9). The model is shown below:

Overall Perception = 3.846+0.565 \* Factor 1 (Satisfaction) + 0.295 \* Factor 2 (Reason for Using) + 0.152 \* Factor 3 (Accessibility & convenience) + 0.141 \* Factor 4 (Competitive advantage)

**Table 9. Regression Coefficients with Four Factors**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.846	0.047	-	81.23	0.000
	Satisfaction (F1)	0.565	0.048	0.636	11.89	0.000
	Reasons for using (F2)	0.295	0.048	0.332	6.20	0.000
	Accessibility & convenience (F3)	0.152	0.048	0.171	3.19	0.002
	Competitive advantage (F4)	0.141	0.05	0.158	2.96	0.004
Dependent Variable: Overall Perception						

Source: Authors Calculation

## 6. Summary, Conclusion, and Recommendations

The study tried to explore Bangladeshi herbal medicine users' perception regarding different aspects of herbal medicine. Broadly, this study looked into customer retention, comparative advantages, availability, consumer satisfaction, and the reasons for using herbal medicine. The survey is conducted using a structured questionnaire to measure users' perception regarding 18 specific and one overall aspects of herbal medicines. The mean index of each of them is found to be positive and significant at 5% significance level except two. Convenient sampling technique was used to get the information from 157 herbal medicine users. The respondents are mainly interviewed in different outlets of the major herbal medicine producers.

The specific satisfaction indices show positive perception of the respondents towards each of the attributes of the herbal medicine. The respondents rated the following six as the most agreeable attributes: i) Made of natural ingredients, ii) Few side effects, iii) Necessary to be available in pharmacies, iv) Affordable price, v) Happy with decision to use, and vi) Suggest to others. Next important ones are i) Referred positively by someone, ii) Products met expectations, iii) Herbal practitioners are knowledgeable, iv) Prefer over other medicines, and v) Use in future illness. The least agreed ones are i) Cheaper than other medicines, ii) Available in close proximity, iii) Reasonable price, iv) Use for chronic disease, v) Adequate number of sales/service centers. Following two variables are found Indifferent at 5% level: i) Use for common/regular disease and ii) Leads to quick recovery than others.

The mean indices of complex variables showed that the competitive advantage is perceived to be the most emphasized one followed by reason for use, customer retention, satisfaction with the product & services, and accessibility & convenience. Overall, the respondents showed quite positive attitude towards the use of herbal medicine. The findings led to the assumption that the perception of the herbal medicine users is positive, but not strongly. Also, the overall mean index is quite close

to the mean of 18 simple variables. Hence, it can be concluded that the responses are quite consistent and positive towards the use of herbal medicines.

The gender wise responses are found different in a number of cases. These include: i) cheaper than other medicines, ii) convenient to get, ii) reasonable price, iii) overall positive perception. Interestingly in each of the 19 cases the female respondents are found more agreeable to the variables than their male counterparts except the variable “Use for chronic disease”. Overall, the female response is more positive than the male respondents.

A weak negative relationship is observed in all but two cases between age and consumers’ perception regarding the use of herbal medicines. Hence, we can conclude that with age the herbal medicine users become a little critical to the usefulness of the medicines. No significant difference is observed of mean perception regarding herbal medicines at different education level except 3 cases: i) Prefer herbal medicines over other medicines, ii) Cheaper than others, and iii) The price of herbal medicine is reasonable. Regarding preference, it is observed that the less educated ones prefer it more than the more educated ones. Interestingly the less educated and highly educated find it cheaper but the mid-level found the price more reasonable.

A factor analysis reduced the 18 simple variables into four factors. The first factor (Satisfaction and retention of herbal products) appears to be the most important as it explains maximum variability. Other factors include “Reason for use”, “Accessibility & convenience” and “Competitive advantage”. The outcomes of the study can be used for marketing herbal medicine more effectively. The overall positive perception represents an opportunity for the marketers of herbal medicine in Bangladesh.

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### Authors Notes

- 1 Folk medicine is medicine using herbal and other remedies based on traditional beliefs, cultural habits, fallacies, religious rituals and spiritualism.
- 2 Unani medicine is an ancient Greek system of medicine (Unaani means Greek) based on the qualities of four temperaments and four humors. The basic knowledge of unani medicine as a healing system was collected by Hakin Ibn Sina (known as Avicenna) in 980 CE in Persia.
- 3 Ayurvedic medicine (“Ayurveda” for short) is one of the world's oldest holistic (“whole-body”) healing systems. It was developed more than 3,000 years ago in India. It's based on the belief that health and wellness depend on a delicate balance between the mind, body, and spirit. Both unani & ayurvedic is traditional and complementary systems of medicine based on scientific knowledge and modern pharmaceutical approaches and technology.

- 4 There are eight administrative divisions of Bangladesh: Dhaka, Chittagong, Rajshahi, Khulna, Sylhet, Barisal, Rangpur, Mymensingh. About (90.4%) of Bangladesh is are Muslims, followed by Hindus (8.5%), Buddhists (0.6%) and Christians (0.4%) and others (0.1%) as per 2011 census.
- 5 The GDP per capita of Bangladesh during the study was \$1855 (2019). It stands at \$2,227 in the fiscal year 2020-21.
- 6 Factor Analysis is a type of analysis used to discern the underlying dimensions or regularity in phenomenon. Its general purpose is to summarize the information contained in a large number of variables into a smaller number of factors. It is an interdependence technique in which all variables are simultaneously considered.
- 7 Communality refers to a measure of the percentage of a variable’s variation that is explained by the factors. It is the amount of variance an original variable share with all other variables included in the analysis. A relatively higher communality indicates that a variable has much in common with the other variables taken as a group.
- 8 ‘Factor loading’ is a measure of the importance of the variable in measuring each factor. It is used for interpreting and labeling a factor. It is the correlation between the original variables and the factors, and key to understanding the nature of a factor.

**Appendices**

**Appendix 1. Coordination Schema**

Parameter	Complex Variables	Simple Variables	Value
Aspects of Herbal Medicine	1) Customer Retention	1) Use in future illness	A 5-point Likert Scale 1: strongly disagree, 2: disagree, 3: Indifferent, 4: agree, 5: strongly agree
		2) Refer/Suggest to others	
		3) Prefer over other medicines	
		4) Use for chronic disease	
	2) Competitive advantage	5) Cheaper than other medicines	
		6) Few side effects compared to others	
		7) Produced from natural ingredients	
	3) Accessibility & convenience	8) Available in proximity	
		9) Adequacy number of sales/service centers	
		10) Use for common/regular disease	
		11) Necessary to be available in pharmacies	
	4) Satisfaction with the product & services	12) Products met expectations	
		13) Happy with decision to use	
		14) Leads to quick recovery than others	
		15) Herbal practitioners are knowledgeable	
	5) Reason for use	16) Reasonable price	
		17) Affordable price	
		18) Referred positively by someone	
Overall satisfaction		19) Overall perception	

### Appendix 2. Independent Sample t-test for Equality of Means Considering Gender

Variables	Gender	Mean	Sig (2-tailed)
1) Use in future illness	Female	3.75	0.110
	Male	3.48	
2) Suggest to others	Female	3.93	0.076
	Male	3.66	
3) Prefer over other medicines	Female	3.67	0.073
	Male	3.31	
4) Cheaper than other medicines*	Female	3.75	0.041
	Male	3.32	
5) Few side effects	Female	4.11	0.944
	Male	4.10	
6) Quick recovery	Female	3.18	0.613
	Male	3.07	
7) Convenient to get*	Female	3.72	0.024
	Male	3.32	
8) Adequacy of sales/service centers	Female	3.43	0.350
	Male	3.22	
9) Necessary to be available in pharmacies	Female	4.21	0.102
	Male	3.99	
10) Products met expectations	Female	3.74	0.238
	Male	3.56	
11) Happy with decision to use	Female	3.90	0.361
	Male	3.76	
12) Herbal practitioners are knowledgeable	Female	3.62	0.859
	Male	3.59	
13) Use for regular disease	Female	3.44	0.056
	Male	3.02	
14) Use for chronic disease	Female	3.26	0.161
	Male	3.54	
15) Reasonable price*	Female	3.92	0.000
	Male	3.19	
16) Can afford herbal medicine	Female	3.98	0.109
	Male	3.76	
17) Referred positively by someone	Female	3.92	0.070
	Male	3.64	
18) Natural ingredients	Female	4.39	0.600
	Male	4.33	
19) Overall positive perception*	Female	4.05	0.016
	Male	3.71	

**Appendix 3. Communalities**

Variables	Communalities	Variables	Communalities
1) Use in future illness	0.594	10) Adequacy number of sales/service centers	0.783
2) Refer/Suggest to others	0.711	11) Use for common/regular disease	0.841
3) Prefer over other medicines	0.639	12) Necessary to be available in pharmacies	0.633
4) Use for chronic disease	0.726	13) Products met expectations	0.676
5) Cheaper than other medicines	0.601	14) Happy with decision to use	0.496
6) Few side effects compared to others	0.647	15) Leads to quick recovery than others	0.741
7) Produced from natural ingredients	0.506	16) Herbal practitioners are knowledgeable	0.675
8) Available in close proximity	0.681	17) Reasonable price	0.368
9) Adequacy number of sales/service centers	0.485	18) Affordable price	0.412