

A BINARY ANALYSIS OF FACTORS INFLUENCING CONSUMERS' PREFERENCE BETWEEN RAW AND MIXED MONSONIA BURKEANA (SPECIAL TEA) IN THE CAPRICORN DISTRICT MUNICIPALITY



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Abstract

This paper assessed the consumer preference between raw and mixed Special tea as well as the factors influencing consumer preference. A snowball sampling approach was used to select 225 respondents from the Capricorn District Municipality. Descriptive statistics and the Binary logistic model were used to analyse the collected data. The results show that most of the consumers are not willing to pay for an already prepared Special tea (69.3%). Most of the consumers preferred raw Special tea (51%) over mixed Special tea (49%). The binary logistic regression results revealed that willingness to pay for raw and mixed Special tea, accessibility of special tea, level of satisfaction in using the tea for health reasons and access to medicinal plants market were found to influence consumer preference. The study recommends the importance of having access to special tea either through established markets or protected areas for harvesting.

1. Introduction

Medicinal products and their use have become a subject of increasing global importance, for their health benefits and economic consideration. Hence, many people resort to these products for treatment of various health challenges in different national healthcare settings (WHO, 2004). The global demand for these products is expanding due to the reinsured interest of consumers in natural products as they are considered safer and more cost-effective. The last ten years have undoubtedly seen a massive increase in the popularity and public interest in natural medicines in both developed and developing nations; these days, herbal remedies can be found not only in pharmacies but even in

grocery shops and supermarkets (Ekor, 2014). The World Health Organization (WHO) estimates that up to four billion people who live in developing nations depend primarily on herbal medicinal products for their healthcare, with traditional medical practices that incorporate the use of herbs being an essential part of the communities' cultural fabric (Bandaranayake, 2006). The medicinal products of Monsonia burkeana (Special tea) play a central role in healthcare since time immemorial in developing countries like South Africa.

As the global use of herbal medicinal products continues to grow and many more new products are introduced into the market,

public health issues and concerns surrounding their safety are also increasingly recognized. Although some herbal medicines have promising potential and are widely used, many of them remain untested and their use also is not monitored. This makes knowledge of their potential adverse effects very limited and identification of the safest and most effective therapies as well as the promotion of their rational use more difficult (WHO, 2002). It is also common knowledge that the safety of most herbal products is further compromised by lack of suitable quality controls, inadequate labeling, and the absence of appropriate patient information (Raynor et al., 2011). It has become essential to furnish the public including healthcare professionals with adequate information to facilitate better understanding of the risks associated with the use of these products and to ensure that all medicines are safe and of suitable quality.

Special tea is one of the medicinal plants that is commonly found and used in different places of the world for the treatment of a number of chronic diseases (Woldensemayat et al., 2016). The users of this herb believe that it has medicinal properties that range from blood cleansing, treatment of erectile dysfunction and improvement of libido. The tea leaves contain many compounds, such as polysaccharides, volatile oils, vitamins, minerals, purines, alkaloids (e.g., caffeine) and polyphenols (catechins and flavonoids) (Hutchings et al., 1996; Mamphiswa et al., 2011). The Monsonial. burkeana leaves and fruits have the highest amount of total phenolic content (TPC) and total antioxidant activity (TAA) found in the entire plant; the stem has intermediate levels, and the roots have the lowest content of TPC and TAA (Ayyanar and Ignacimuthu, 2005). The Monsonial burkeana has compounds with antibacterial properties that can be used as antimicrobial agents in the development of new drugs for the treatment of infectious diseases (Maroyi, 2013).

According to Nnzeru et al. (2016), Special tea grows seasonally and is dependent on natural rainfall for its growth. Special tea like any other medicinal plant is characterized by a bitter taste in nature, leading to the use of additives when preparing it. This practice was also reported by Uzumdumlu et al., (2019) who observed that the consumption of medicinal teas among students increased when mint and lemon were used in preparing product profiles as they are expected to improve the taste, smell, and intake of medicinal remedies. Moreover, this practice has led to the emergence of various methods of preparing medicinal plant remedies which can be justified by culture, societal beliefs, and customer preference. Musila (2000); Kitula (2007) and Kunwar et al., (2013) indicate that approaches such as decoction, drying, boiling, and pounding are common among users of medicinal plants. Additionally, Kunwar et al., (2013) and Mahomoodally and Mooroteea (2021) found juice to be one of the most used

attributes when preparing medicinal plants remedies. Hence, this study intended to find the factors influencing consumer preference between raw and mixed special tea.

2. Materials and Methods

2.1. Data Collection

The study was carried out in the Capricorn District Municipality (CDM) under the Limpopo Province, South Africa as part of a PhD study. The CDM is predominantly rural in nature and its vegetation consists mainly of savanna bushveld, sweet grass, shrubs, and thorn trees. In summer, the CDM has rainfall between 200mm and 500mm with 22° to 35° in summer and 18° to 22° in winter. These climatic conditions are suitable for the growth of the Special tea which is mostly harvested in summer. The harvesting of the Special tea plants in winter, spring and autumn have also been reported by Nnzeru et al., (2019). The Special tea is generally harvested from higher altitude grasslands which fall under the northeastern mountain grasslands and the mixed bushveld (Nnzeru et al., 2019). With this being the case, most people in the study area consume and sell this tea for various reasons due to its health benefits and for income generation.

A survey questionnaire was used to collect data from the respondents. The questions were related to the socioeconomic characteristics and the different attributes that respondents use when preparing Special tea. Likert scale type of questions was also developed for generating information about the level of satisfaction that respondents generate from consuming Special tea. Purposive and snowball sampling techniques were used to select 225 respondents from an unknown population size of consumers, because snowball is best suited for studies with hard-to-find respondents (Palinkas et al., 2018).

2.2. Data Analysis Tools

Descriptive statistics were used to identify and describe the socioeconomic characteristics of consumers and to assess the level of satisfaction through measures of central tendencies like the mean. A Binary Logistic Model (BLM) was used to determine factors influencing consumer preference for raw and mixed Special tea.

The model is specified as:

$$\ln = \frac{[p(y = \frac{1}{x})]}{[1 - p(y = \frac{1}{x})]} \beta_0 + \beta_1 X_1 + \beta_n X_n + U_i$$

Where: p_i = is the probability that consumers prefer raw Special tea

$1 - p_i$ = is the probability that consumers prefer mixed Special tea

$\beta_i - \beta_n$ = is the estimated parameter

X_i = is the explanatory variable

U_i = is the disturbance term.

3. Results And Discussion

Table 1 shows the distribution of Special tea preference among males and female consumers. The results indicate that more females prefer the mixed form while more males prefer the raw form. Similarly, respondents who are single and those who are widowed or divorced tend to prefer the raw form, while married individuals are more evenly split between raw and mixed preferences. The association between religious affiliation and Special tea preference are also shown in Table 1. It appears that

Christians have a relatively balanced preference, while individuals with other religious affiliations show a slightly higher preference for the raw form of the Special tea. The link between employment status and Special tea preference shows that self-employed individuals are evenly divided between raw and mixed preferences, while those with part-time employment tend to prefer the mixed form.

Table 1. Cross tabulation of the socio-economic characteristics of the consumers and their preference of Special tea

Socio-economic variables	Raw	Mixed
Gender		
Male	66	71
Female	48	88
Marital status		
Single	70	73
Married	37	33
Widowed	4	5
Divorced	3	0
Religion		
Christian	81	85
Cultural	13	7
Other	20	19
Employment status		
Unemployed	37	30
Self employed	29	33
Part-time employment	6	21
Full-time employment	30	31
Pensioner	11	6
Other	1	0

Table 2 shows that many (51%) of the respondents prefer consuming the tea alone without additives. In addition, a large proportion (53.3%) of the consumers who prefer consuming the tea with additives, preferred mixing the tea with milk, while 70.2% were also satisfied with consuming the tea with milk and FG coffee. Furthermore, 66.7% of the respondents preferred mixing the tea with milk and Joko. Only 25.3% of respondents enjoyed consuming the tea alone and they felt very satisfied.

Nevertheless, only 0.9% of the respondents reported that they were not entirely satisfied with consuming the raw tea. In addition, a combination of milk and FG coffee and Joko did not completely satisfy 0.4%, 1.8% and 0.9% of the respondents respectively at all.

Table 2. Preference for raw and mixed Special tea

	Preference distribution for Special tea (%)	Not satisfied at all (%)	Not satisfied (%)	Not sure (%)	Satisfied (%)	Very satisfied (%)
Raw	51	0.9	6.2	28.9	38.7	25.3
With milk	49	0.4	0.9	53.3	28.0	17.3

With milk and FG coffee	1.8	0.9	70.2	14.7	12.4
Joko and milk	0.9	0.4	66.7	19.1	12.9

Reasons for preferring raw or mixed Special tea are shown in Table 3. Many consumers preferred raw Special tea because they believe it is strong and effective while a smaller percentage (8%) chose raw Special tea for its perceived cleansing properties. Some consumers opted for raw Special tea because they believe it can specifically target and alleviate pain. Similarly, few consumers preferred raw Special tea expecting it to deliver the highest level

of satisfaction. About 3% of the consumers choose raw Special tea to avoid diluting its potency. Some consumers (5%) enjoyed the bitter taste of raw tea. Despite this, a very small percentage cited financial constraints as a reason for choosing raw Special tea.

Table 3. Reasons for preferring raw or mixed Special tea

Reasons for preferring raw Special tea		Reasons for preferring mixed Special tea	
It is strong and works well	67%	Add flavour	21%
It cleanses the body	8%	Dilute the tea	9%
Other reasons	1%	Improve the efficiency	11%
Targets the pain	10%	Reduce bitterness	47%
Get perfect results	5%	Improve efficiency and reduce bitterness	4%
To avoid diluting the tea	3%	Adds flavour and reduce bitterness	5%
Enjoy the bitterness	5%	Other reasons	3%
Cannot afford the things for mixing	1%		

Regarding reasons for preferring mixed Special tea, about 21% of the consumers preferred mixed Special tea to add flavor. Some consumers chose mixed Special tea to dilute its strong taste other than consuming it raw. A notable portion preferred mixed Special tea to enhance its effectiveness. Most consumers who choose mixed do so to reduce the bitterness of the tea. In addition, a smaller percentage (5%) seeks both improved efficiency and reduced bitterness from consuming mixed raw Special tea. Some consumers want both added flavor and reduced bitterness in their tea. About 3% of the respondents mentioned other unspecified reasons for preferring mixed Special tea. These preferences reflect a balance between consumers who value the traditional, strong nature of raw tea and those who seek a more palatable

experience through mixing. Understanding these preferences can inform marketing strategies and product development to cater for the diverse consumer needs.

The binary logistic regression model was used to analyse factors that influence consumer preference for raw and mixed Special tea and the results are presented in Table 4. The -2Loglikelihood of the estimated model is 30.673 implying that the model could be relied on for predicting the consumer preference. Nagelkerke R Square of 0.614 was reported in the study, implying that the model explained 61% of the variation from the independent variables.

Table 4. Binary logistic results for factors that influence consumer preference for raw and mixed Special tea

Variables	B	S.E	Wald	Sig.
Willingness to pay for raw Special tea	0.050	0.025	3.990	0.046**
Accessibility of Special tea	-0.336	0.138	5.941	0.015**
Satisfaction for treating health problems	-0.524	0.175	8.970	0.003***
Access to the market of indigenous medicinal plants	-0.557	0.262	4.500	0.034**
Willingness to pay for mixed Special tea	0.634	0.328	3.732	0.053**
Knowledge transfer	-0.003	0.098	.001	0.979
Religion	-0.201	0.193	1.086	0.297
Age of the respondent	-0.012		1.178	0.278
Constant	2.804	1.256	4.984	0.026
Model summary				

(-2) Log-likelihood	30.673
Cox & Snell R Square	0.460
Nagelkerke R Square	0.614

***, ** significant levels of 1% and 5% respectively

Willingness to pay for raw Special tea: The variable ‘willingness to pay for raw Special tea had a positive influence on consumer preference for raw Special tea. The variable was also found to be statistically significant at 5%. The results suggest that consumers in the study area were more likely to prefer raw special tea over mixed special tea. Hence, most of the consumers of special tea preferred no additives for flavor or reducing its bitterness.

Accessibility of Special tea: Accessibility influenced the consumer preference for raw special tea negatively and the variable was found to be significant at 5% level. The outcome suggests that consumers who find Special tea to be easily accessible are more likely to have low preference of raw special tea over mixed. These consumers are most likely to try different methods of preparing the tea to avoid having to consume it in the same way more often.

Satisfaction for treating health problems: The level of satisfaction with the use of special tea for treating health problems was found to be negative but significant at 1%. The findings suggest that consumers who use Special tea for treating sexual problems might not be certain that the consumption of this tea treats health problems.

Access to the market of indigenous medicinal plants: The variable “access to the market of indigenous medicinal plants was also found to have a negative influence on the dependent variable. The results suggest that the consumers who have access to indigenous medicinal plants are less likely to prefer raw special over mixed special tea. This can also act as an influence of medicinal plants markets in trying to improve taste and preference on the product they are selling.

Willingness to pay for mixed Special tea: The variable “willingness to pay for mixed Special tea” had a positive influence on preference for special tea with a 5% level of significance. The variable results indicate that consumers who are willing to pay for mixed tea are more likely to prefer raw special tea. This might be that raw boiled special tea is more likely to have a prolonged shelf life and at times consumers may prefer to make their own combinations when mixing the tea.

4. Conclusions

The study examined the consumer preferences and factors influencing the choice between raw and mixed Monsonial

burkeana (Special tea) in the Capricorn District Municipality of Limpopo Province, South Africa. A considerable portion of the population uses herbal medicinal products, especially Special tea, for a range of health benefits, demonstrating the products' importance in traditional healthcare practices. The research highlighted the diverse socio-economic factors influencing consumer preferences, shedding light on gender, marital status, religion, and employment status correlations with raw or mixed tea choices. The study also uncovered reasons for the preferences, with a balance between those valuing the traditional strength of raw tea and others seeking a more palatable experience through mixing. Factors like willingness to pay, accessibility to Special tea, and satisfaction with its use for treating health problems play significant roles in shaping consumer preferences. The findings illustrated the complex relationship between cultural, economic, and health-related factors in the consumption patterns of herbal medicinal products. Understanding these factors is crucial for informing marketing strategies and product development to cater to diverse consumer needs, ensuring both safety and efficacy in the utilisation of herbal medicines. As the global interest in herbal medicinal products continues to rise, addressing public health concerns and promoting rational use with adequate information becomes paramount, emphasising the need for further research and education in this field.

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