

Article

Influence of Spirituality on Bitter Kola Consumption Among Pretoria Residents in Response to COVID-19 and Related Illnesses

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Abstract: The agrarian continent of Africa has many fruits with nutritional, medicinal and spiritual values. Regardless, Africa leads the statistics of poor healthcare globally. Two major challenges in Africa's healthcare system are poor access and the high cost of medical healthcare. Among others, the effects of such challenges include low responsiveness to medical treatment and a high mortality rate. However, it seems the nosophobia that accompanied the global mortality rate during the COVID-19 pandemic may have triggered a spiritually influenced alternative. One of the traditional alternatives was a subscription to *Garcinia Kola*, popularly known as Bitter Kola (BK). This article, majoring in spiritual and not psychological influence, raised a hypothetical question: does spirituality influence Africans' traditional response to COVID-19? To answer this question, Sunnyside in Pretoria was chosen as a demography to investigate the hypothesis. Data were collected via mixed research methods. There were 16 qualitative respondents, including sellers, herbalists and clergies, and 75 consumers as quantitative respondents under probability sampling. The results analysed using Excel and Python's regression analysis demonstrated strong connections between consumers' spiritual motivations, the sales period, the sales rate, and the swift traditional response to the pandemic and related illnesses. The outcome validated the influence of spirituality on 60.9% of quantitative respondents and showed how 25–72% responded to COVID-19 symptoms with BK. Likewise, 87.5% of qualitative respondents consumed BK via indigenous spiritual knowledge in response to the pandemic. Subsequently, this article discussed the benefits, limitations and lessons of spiritual influence on BK consumption in the post-COVID-19 era.

Keywords: bitter kola; COVID-19; motivation; indigenous knowledge; influence; spirituality



Citation: Orogun, Daniel, and Harold G. Koenig. 2024. Influence of Spirituality on Bitter Kola Consumption Among Pretoria Residents in Response to COVID-19 and Related Illnesses.

Religions 15: 1508. <https://doi.org/10.3390/rel15121508>

Academic Editors: Fides del Castillo and Ron Scapp

Received: 3 October 2024

Revised: 27 November 2024

Accepted: 6 December 2024

Published: 11 December 2024



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1. Introduction

Healing is not new to Africa. Ododo notes there is no superiority or difference between the allopathic and herbal systems of medicine, nor are there established dosage controversies strong enough to set aside the African naturopathic practices. He alludes further that Western medicine was derived from herbal medicine; therefore, both are not mutually exclusive (Pharma News 2018). This means healthcare can be medical and traditional (cf. Swihart and Martin 2023). The duo healing is ancient in human history and religion, and only recently has medicine taken on a scientific dimension that promotes the separation of religion and medicine. Although arguments support the co-existence of traditional and scientific approaches to healing, one cannot replace the other; one is scientific, and the other is cultural and spiritual. This is why the research on the religious influence of healing fruits like Bitter Kola (BK) is critical, especially in Africa.

In Ghana, BK is used for traditional rituals and spiritual cleansing. Concurrently, it is used as a tonic, stimulant, astringent, decongestant, antioxidant, anti-inflammatory, and

lipolytic drug. In spiritual warfare, it is deployed to suppress enemies ([Ghana Insider 2020](#)) and plays a vital role in African ethnomedicine and traditional ceremonies. It is popularly referred to as a “wonder plant” because both the pills and the content can be used as medicine ([Lall 2019](#); [Onasanwo and Rotu 2016](#), pp. 363–70). [Signé \(2021\)](#) argues that genetically modified food and junk cause higher health risks, but BK and other African fruits minimise health risks. See the image of Bitter Kola below in [Figure 1](#).



Figure 1. Image of peeled and unpeeled African Bitter Kola fruit.

Despite the availability of spiritual and cultural medicines to bridge the healthcare demand and supply gap, less attention is paid to traditional and spiritual alternatives in the medical world. According to [Roberts \(2019\)](#), religious involvement and spirituality promote greater longevity, coping skills, health-related quality of life, and reduced anxiety, depression, and suicide. With these benefits, Roberts claims there is still little quantitative research published in peer-reviewed journals exploring the relationship between spirituality and health because as the world progresses with scientific discoveries, “practitioners in medicine, public health, psychology, sociology, spirituality, religion, economics and law, have all gone to distinct silos” ([Roberts 2019](#), p. 1). This explains why research on the spiritual values of African BK is imperative to support attempts in academia to bridge the knowledge gap between religion and health (cf. [Marks 2022](#)).

Furthermore, [Cullinan \(2021\)](#) reports that below 52% of Africans access healthcare, meaning the continent’s quality of health services is poor. President Uhuru Kenyatta and Kagwe, Kenya’s Health Secretary claimed there was a lack of medical resources like PPE and reagents during the COVID-19 pandemic ([Cullinan 2021](#)). [Human Rights Watch \(2020\)](#) suggested that the pandemic exposed health shortfalls across Africa. Other reports also show Africa’s poor healthcare before, during, and after COVID-19 ([Njong 2020](#); [Pheage 2016](#)). [World Bank \(2015\)](#) claims Africa had the least available healthcare service providers. In Sub-Saharan Africa, there is only one nurse available per 1000 patients and one physician for 2000 patients ([Orogun 2023](#), pp. 20–21). [Conway et al. \(2019\)](#) assert that 70–90% of drugs consumed in Africa are imported from foreign pharmaceutical companies. Such overdependence, in addition to high costs, leads to an increase in counterfeit drugs, deterioration of illness, and mortality, signalling a poor health index ([World Health Organization 2018](#)).

With all being said, records show that besides China, COVID-19 deaths were minimal in Africa compared to other regions between 2020 and 2024. This is evident in [Figure 2](#) below, as provided by the World Health Organization ([Our World in Data 2021](#)). The question then is, could some traditional alternatives in Africa have promoted a reduction in

mortality? Meanwhile, during the pandemic, reports show that people were afraid of death via COVID-19. Ilyas et al. (2024, p. 31) and Bhandari (2023) both submit that across the globe, COVID-19 spreads nosophobia (fear of becoming infected or dying via COVID-19). Ilyas et al. (2024, p. 32) further emphasise that fear of COVID-19 affected healthcare professionals and the healthcare community during the pandemic. Thus, many Africans resorted to traditional fruits like BK as a preventive medicine. However, the question remains whether such an alternative was influenced by indigenous spiritual knowledge.

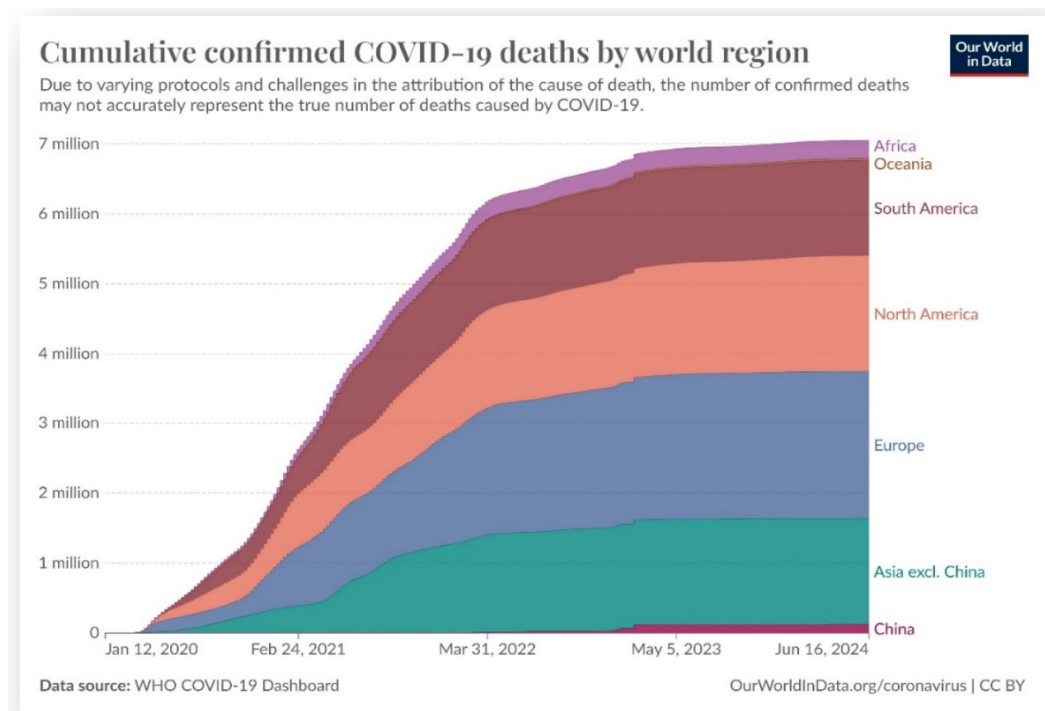


Figure 2. Confirmed COVID-19 death by world regions.

With the information above, it may be hypothesised that spiritual and traditional remedies become handy to mitigate these challenges. Therefore, it is easy to sustain Professor Iwu's argument that functional fruit plants should be used to prevent or cure various medical conditions. Iwu in Aboderin (2017) discusses the validation of traditional medicine where he asserts that fruits like Bitter Kola with antihepatotoxic, anti-inflammatory, and antiviral properties in combination with other herbs and mushrooms can act beyond food but also as medically functional plants to treat different health conditions. Recently, Africans have increasingly subscribed to BK due to its affordability, accessibility, and organic nature in response to illnesses. Therefore, with the hypothesis suggesting indigenous spiritual knowledge is a major influence, this paper attempts to investigate such claims. In achieving this, the methods, results, discussions, and evidence of influence are presented in subsequent sections.

2. Brief Historical Reviews

The history of BK available in the public domain could not specify when the African fruit was discovered. However, literature reveals its name, long-time existence, spiritual values, and plantation region. One of the earliest entries for BK dates back to 1985, as provided by Akinnibosun (2013, pp. 174–80). A prior date of BK discovery in terms of value can be linked to some reports. Sprague (2018) reveals that a Portuguese explorer who travelled around the West African region in 1587 met many Africans who used the nut to allay thirst and spice up the taste of water by chewing the plant, while others used the plant to strengthen the stomach and fight liver disease. In another report, BK can be linked to the foundation of Coca-Cola when, on 8 May 1886, John Pemberton introduced his perfected

syrup to Jacobs' Pharmacy in downtown Atlanta ([The Coca-Cola Company 2024](#)). [Zelman \(2024\)](#) submits that Coca-Cola attained its name and some of the first recipes from Bitter Kola plant extracts. Though the company has not used actual kola to flavour its sodas in years, the name remains a reminder of the unusual plant that inspired the iconic drink. This information suggests the long-standing existence and value of BK in human history.

Further, [Okoye et al. \(2014\)](#) sustain that BK is a flowering plant mostly found in Central and West African rainforests. They claim that in ethnomedicine, these edible seeds are used as a purgative, antiparasitic, and antimicrobial agent for throat infections, diarrhoea, and bronchitis, among others. BK remains one of the medicinal plants used in African traditional medicine for treatments, and such value cannot be underestimated given that almost 80% of the world's population still depends solely on traditional, herbal, or ethnomedicine, especially in African and developing nations ([Okoye et al. 2014](#), pp. 535–55). Thus, the use of BK in the African continent extends beyond ethnomedical purposes. According to [Sprague \(2018\)](#), to Africans, BK is a form of currency, a spiritual or religious ceremony seed, or an element used in reinforcing social contracts. [Sprague \(2018\)](#) further submits that in the late 19th century Gambia, BK was sworn upon as the Bible was in Western countries; people are required to swallow the nuts to convey their honesty. In Sierra Leone, it is a form of currency, and in Ghana, it is used for religious rituals. Other cultural symbols and uses of BK include hospitality, social ceremonies like weddings and prayers, and traditional rituals, and it is consumed as food. It is also used in flavouring or seasoning food and drinks as a stimulant, energy booster, and for cosmetic and skin care. These cultural, social, and spiritual values attract trade and economic value and some form of cultural conservation ([Ogwu et al. 2023](#), pp. 1–30; cf. [Unya 2021](#), pp. 289–312).

So far, this historical background suggests that BK is not only medicinal in contemporary times but has a long-standing account of cultural, social, and spiritual values in Africa and beyond. More information on its spiritual and medical values will be delineated in subsequent sections.

3. Materials and Methods

3.1. Demography

There is justification for conducting the research in Sunnyside. The location seems to house an appreciable population of African immigrants, especially West Africans, a people with a deep understanding of both the spiritual and traditional relevance of Bitter Kola (BK). The high traffic of BK sales, as evident in the data, indicates a high connection with and value placed on the product by the residents and consumers.

[Seeff \(2019\)](#) reports that Sunnyside is one of the oldest Suburbs in Pretoria, with shops and markets housing many prominent businesses (retail and wholesale). It is a popular location for first-time home buyers, investors, and small-scale traders. It is, therefore, not surprising that Robert Sobukwe Street houses hundreds of retail shops selling African products, including BK. Additionally, the submission of [Munro \(2024\)](#) expresses that varied accommodations within a strong sense of community have always been the core strength of Sunnyside. In the research of [Oosthuizen \(2015\)](#), South Africa's post-apartheid era witnessed the influx of local and foreign people of different races to high-density residential, commercial, and affordable areas like Sunnyside. Consequently, many languages are spoken in Sunnyside and related areas in Pretoria. Thus, high traffic of commercial activities, including high sales and consumption of BK, by a multi-ethnic population in Sunnyside informed the justification for the choice of the location.

After justifying the choice of location, [Figure 3](#) below shows the nationalities of the participants, with the majority from West Africa, where Bitter Kola is produced and revered because of its spiritual value. These include Nigeria (50.7%), Cameroon (8%), Ghana (16%), DR Congo (10.6%), South Africa (9.3%), Zimbabwe (4%), and Malawi (1.3%). In these data, about 74% of the participants are West Africans.

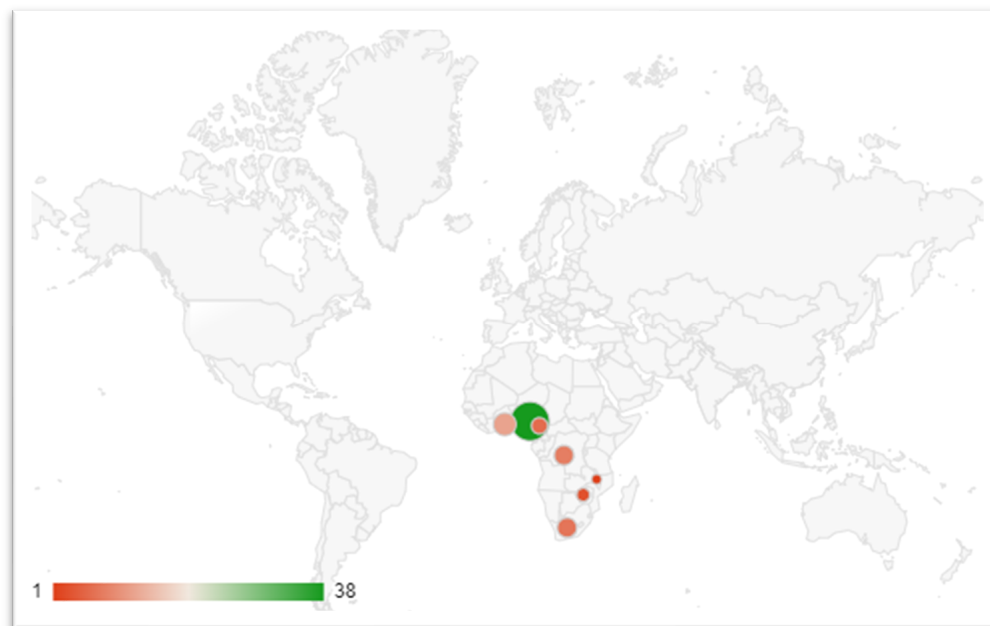


Figure 3. Demography of participants' nationalities.

3.2. Ethical Approach

This exercise is part of the author's research portfolio on the interplay of spirituality and healthcare. In this regard, ethical clearance was obtained from the research and ethics committee of the Faculty of Theology and Religion at the University of Pretoria on the 12 January 2024. Subsequently, a research instrument was developed in line with the research objectives within the parameters of ethical protocols permitted by the ethical approval. First, consent of participation tops the ethical compliance protocol. The leading question administered required participants to click on the consent button. The results showed that 95% of the participants clicked the consent button, while only 5% did not by omission. Thus, the researcher inferred that all participants voluntarily provided information for the research. Second, the researcher assured participants that all information provided would remain confidential and be used solely for this research.

3.3. Research Method

A mixed method that consisted of qualitative and quantitative research was deployed (Subedi 2016). The qualitative interview had 16 sellers of Bitter Kola (BK) as participants; 4 herbalists, 3 clergies, and 9 sellers who were neither clergies nor herbalists. Among all, 3 were females, and 13 were males. On the other hand, the quantitative exercise was conducted using a survey questionnaire, and 75 consumers responded. Among all participants, 29.3% were between the ages of 18 and 35; 57.3% were in the 36–50 age bracket; 13.3% were between the ages of 51–80. The research lasted 90 days in Robert Sobukwe Street in Sunnyside: the hub of African fruit sales in Pretoria.

The qualitative exercise ensured data reliability and validity with data collected from about 50% of the sample population as the sample size. There are about 30 traders of BK on Robert Sobukwe Street, including non-Black Africans (Pakistanis and Afrikaans) without clues of the spiritual value of BK, selling the product due to high demand to improve their income. However, the research focused on participants with a sense of African spirituality. Thus, the targeted population was about 30, and the 16 participants as the sample size represented over 50% of the sample population. Consequently, the sample size was reliable and valid since only an estimated 5–10% was required for validity and reliability in quantitative research (see Andrade 2020, p. 103). Regarding analyses, thematic and simple explanatory approaches were adopted for the qualitative method, while Excel and Python were used to analyse the quantitative data for further interpretations.

4. Results

The quantitative and qualitative results will be discussed in different subsections but juxtaposed under the discussion section to provide conclusions on the influence of Bitter Kola (BK) in response to illnesses.

4.1. Quantitative Results

The consumers were chosen randomly. Consumers were met at the sales centres, and their participation was requested. About 75 participants responded. The data collected have been categorised under three variables with acronyms presented in Table 1 below.

Table 1. Summary of consumption, motivation, and sales of Bitter Kola in Sunnyside.

Variable A	Consumption/Sales Period%				Variable B	Consumption Motivation%		Variable C	Consumption/Sales Frequency%					
	CY	Pre-COVID 2018–19	COVID 2020–21	Post-COVID 2022–23		Pos	Neg		CP	Ocass.	Daily	Weekly	Monthly	Randomly
	CS1	37.5	62.5	55.6		SM	60.9		39.1	CS2	11.4	2.7	26.7	12
SP	47.1	76.5	52.9	MM	42	58	SR	0	-	5.9	94.1	0		

The results above show three variables (ABC). Firstly, Variable A—Consumption/Sales Period—consists of the Consumption Year (CY), Consumers1 (CS1), and Sales Period (SP), which are presented. The results revealed that consumption was low and aligned with sales in the pre-COVID era, dramatically increased during COVID-19 and took a new normal in the post-COVID period, as evident in Figure 4 below. While the new normal position of BK sales became lower than the COVID-19 period, the linear regression shows it was considerably higher than the pre-COVID consumption and sales.



Figure 4. CY, CS1, and SP.

Furthermore, using a Python analysis instrument, Table 2 below summarises the results of an ordinary least squares (OLS) regression analysis. The analysis was conducted on a dataset or data frame (df) extracted from Table 1 with five observations, which are CY, CS1, CS2, SP, SR, and two variables, where the independent variable is (x), and the dependent variable is (y).

To capture regression analysis, the values x and y must be calculated.
 So, $x = df[['Consumers 1']]$ and $y = df['Sales Period']$
 Adding a constant term to the independent variables makes it $x = sm.add_constant(x)$
 And the Linear Regression Model is $model = sm.OLS(y, X).fit()$
 To Calculate the predicted y-values using the regression equation –
 $y_values = [intercept + consumers_coefficient * x \text{ for } x \text{ in } x_values]$
 Where consumers coefficient = 1.0693 and intercept = 5.3583, as seen in Table 2 below.
 To Create the plot - $x_values, y_values, label = "Regression Line"$, as presented in Figure 5.

Table 2. Summary of ordinary least squares (OLS) regression analysis.

Dep. Variable:	Sales Period	R-squared:	0.801			
Model:	OLS	Adj. R-squared:	0.735			
Method:	Least Squares	F-statistic:	12.09			
Date:	Sat, 16 Mar 2024	Prob (F-statistic):	0.0401			
Time:	18:48:43	Log-Likelihood:	-16.114			
No. Observations:	5	AIC:	36.23			
Df Residuals:	3	BIC:	35.45			
Df Model:	1					
Covariance Type:	nonrobust					
=====						
coef	std err	t	P > t 	[0.025	0.975]	
const	5.3583	16.107	0.333	0.761	-45.901	56.618
Consumers 1	1.0693	0.308	3.477	0.040	0.091	2.048
=====						
Omnibus:	nan		Durbin-Watson:	1.465		
Prob (Omnibus):	nan		Jarque-Bera (JB):	1.536		
Skew:	-1.357		Prob (JB):	0.464		
Kurtosis:	3.062		Cond. No.	241.		

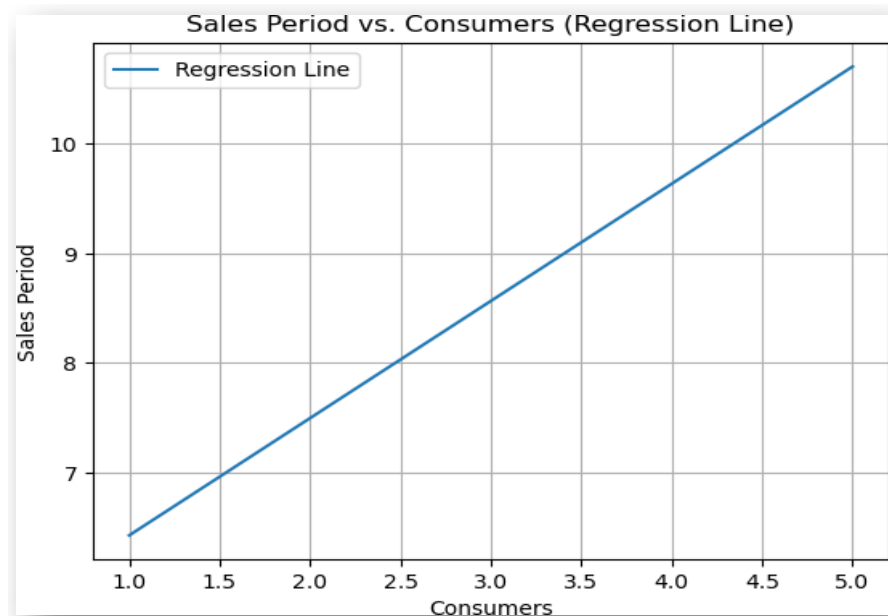


Figure 5. Python linear regression line on variables x and y.

4.1.1. Python Regression Interpretation and the Implication for the Research
 The Model Fit Statistics

- a. In Table 2 above, the regression result (**R-squared**) is **0.801**. The value indicates that 80.1% of the variation in the sales period can be explained by the independent variable

- (x). This means Bitter Kola consumers' motivations explain the sales before, during, and after COVID-19.
- b. The **Adj. R-squared (0.735)** is the adjusted version of R-squared, which accounts for the number of independent variables and is a more reliable measure of fit for small datasets. As seen in Table 2 above, the Adjusted R-Square is approximately 74%, and it means the 'sales period' can be explained by consumers' actions before, during, and after COVID-19.

Coefficient Estimates

- c. The **const (5.3583)** in Table 2 above is the y-intercept of the regression line in Figure 5. It represents the predicted value of the sales period when the consumer variable is zero (which may not be a realistic value in the data). However, the std err (a standard error of **0.308**) measures the variability of the coefficient estimate. A lower standard error indicates a more precise estimate. Since 0.308 is considered a low standard error, it suggests the estimate of the value of the sales period intercepting consumers' action is accurate.
- d. **t (3.477) and P > |t| (0.040)**: The **t-statistic** tests the significance of each coefficient. The *p*-value (0.040) for BK consumers is less than 0.05, indicating a statistically significant relationship between consumers and the sales period. A coefficient of 1.0693 suggests that for every unit increase in consumers, the sales period is expected to increase by 1.0693 units on average, holding all other factors constant. This supports the argument that there is a strong relationship between what influences BK consumers and the sales period and sales rate before, during, and after COVID-19.
- e. **F-statistic (12.09) and Prob (F-statistic) (0.0401)**: The F-statistic, which is the Ronald Fisher statistic, is very valid because it tests whether the model is statistically significant or not. A low *p*-value (here, 0.0401) suggests the model is significant, meaning the independent variable has a statistically relevant effect on the dependent variable. In other words, what influences or motivates the consumers impacts the sales period. Thus, whatever influences the consumption of BK drives the sales during and after COVID-19.

Diagnostics

Cond. No. (241): This **condition number** indicates potential multicollinearity among the independent variables. A high number suggests the model might be unstable due to collinearity, but 241 is considered a low number; therefore, it is likely not a major concern in this data analysis.

Overall, the regression analysis suggests a statistically significant relationship between consumers' influence, the period, and the sales of BK. The coefficient estimates indicate the data and conclusive interpretations are precise with insignificant errors. It shows the research outcome and interpretations are valid and reliable. Lastly, the regression analysis supports the hypothesis, implying that there is a motivation behind the actions of BK consumers before, during, and after COVID-19.

4.1.2. Deducing the Motivation (Influence)

With the results, analyses, and interpretations in Table 2, and Figures 4 and 5 depicting a motivation behind consumption, the next logical question would be about the motivation for the higher consumption of BK. The statistics of *Variable B—Consumption Motivation*—in Table 1, which consists of Spiritual Motivation (SM) and Medical Motivation (MM), are presented in Figure 6 below to show participants' responses regarding what influences the consumption of BK during and after the pandemic. Various spiritual reasons were mentioned as motivation for subscription to BK. About 60.9% of participants consume BK because of its spiritual value, while 39.1% know nothing about the spiritual connotation of BK.

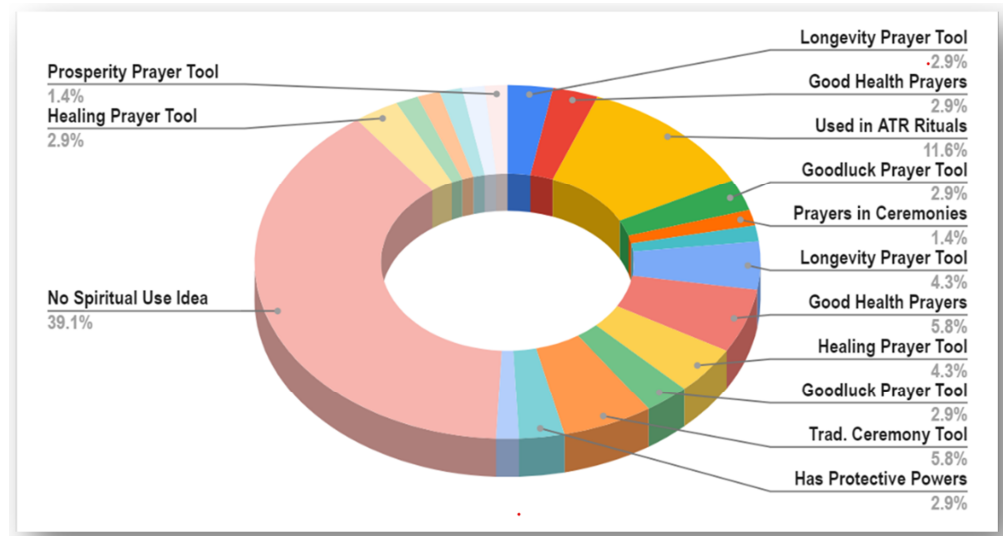


Figure 6. Participants’ opinions on the spiritual influence of Bitter Kola.

Based on the data provided here, if spiritual value is the main motivational factor, it stands to reason that spirituality greatly influences the consumption of BK in response to COVID-19 and related illnesses. It is also interesting to discover that some illnesses from the data source in Figure 7 below are symptoms of COVID-19. About 72% of the participants use BK in treating coughs and flu, 32% in controlling blood pressure, and 26.7% use it as a chest pain remedy¹. Other COVID-19 symptoms that triggered the use of BK among participants include a cracked voice and throat pain (37.3%)². It is also important to note that 25.3% of the participants use BK to build their immune system against COVID-19 infection. These data align with the interpretations in *variable A* as they show a strong connection between motivation, sales, and the traditional application of BK in COVID-19. In summary, it is deduced that the spiritual value of Bitter Kola influences consumption.

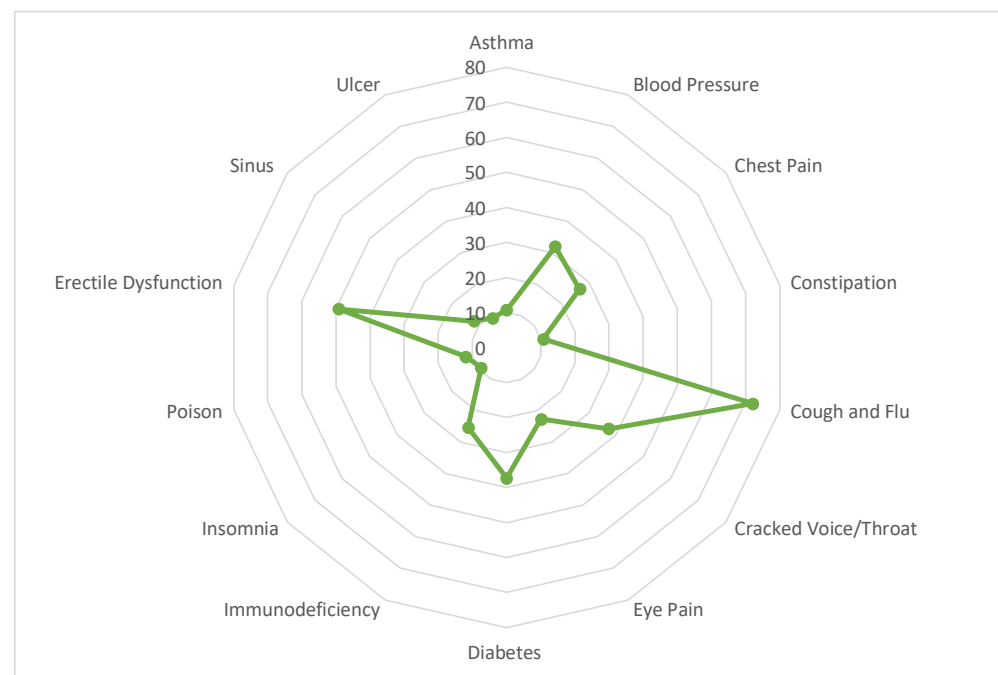


Figure 7. COVID-19 symptoms and related illnesses influencing subscription to the spiritual value of BK.

4.1.3. Pros and Cons of Deductions

Variable C—Consumption/Sales Frequency—which comprises the Consumption Period (CP), Consumer2 (CS2), and Sales Rate (SR), provides other deductions for the study. Figure 8 below shows that 94.1% of sellers trade and restock BK products monthly, which is an indication of the consumption rate and economic relevance of the product. Although 44% consume BK randomly, they budget for the product as part of their monthly healthcare expenditure. The fact that a monetary allocation is made monthly for BK subscriptions indicates that subscribers have faith in the product. Given the data gathered and analysed so far, this article suggests that such a faith factor is rooted in the traditional spiritual knowledge of the Africans in Sunnyside. However, the article wishes to submit that, either for preventive or curative purposes, the value of Bitter Kola in its medical sense as a curative element during COVID-19 is yet to be proven. Moreover, random consumption speaks to the possibilities of immeasurability of consumption quantity (dosage), an antithetical culture to medical and pharmaceutical prescriptions of dosage, leading to abuse and negative effects among consumers. Therefore, despite the spiritual value influencing BK subscribers, there are downsides to the practice and belief system. This will be further highlighted in the limitations of the study. In the meantime, this paper will present and analyse the qualitative data and juxtapose it with the quantitative results and interpretations.

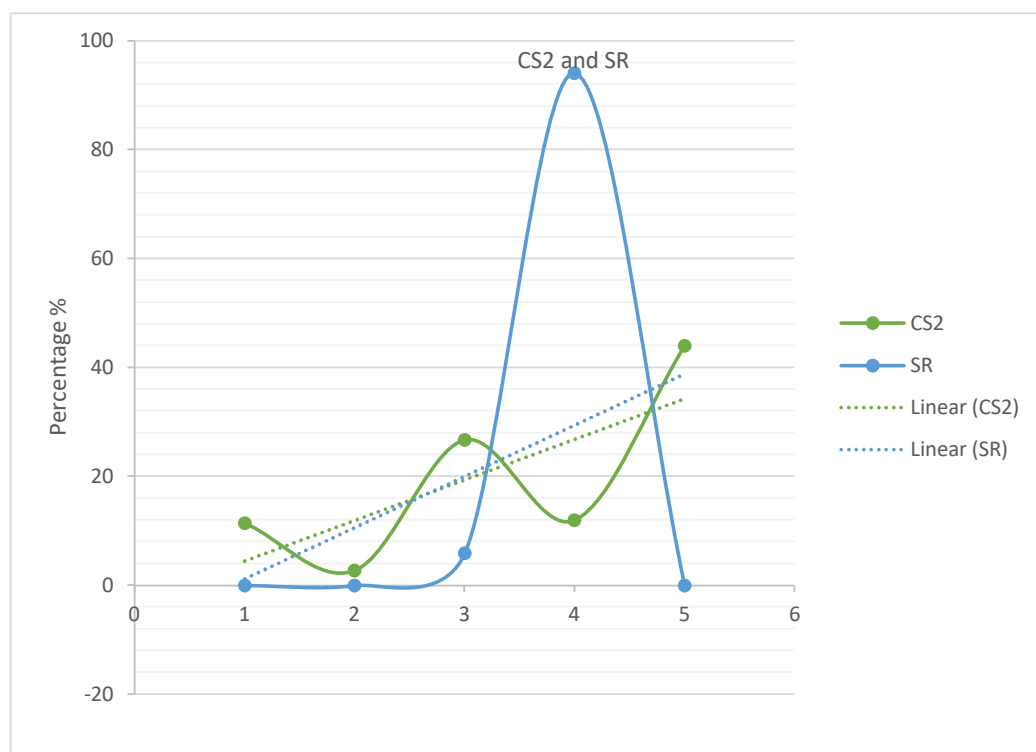


Figure 8. Consumption and sales frequency.

4.2. Qualitative Results

The qualitative research respondents consist of four herbalists, three clergies (43.8%), and nine sellers (56.2%). Also, among the 16 participants, there are 3 females and 13 males. All participants consume BK and are nationals of Nigeria (62.5%), Ghana (18.7%), Cameroon (12.5%), and South Africa (6.3%). Pseudonyms were adopted in compliance with ethical standards. Table 3 below shows the summary of the interviews conducted.

Table 3. Summary of participants' opinions on the values, pros, and cons of Bitter Kola.

No	Name	Spiritual Value	Spiritual Value in Medical Use	Pros	Cons	Country
1	Segab	Sacrifices, Worship, and Prayers	Spiritual belief in BK facilitates quick healing	Organic (O) Curative (C) Affordable(A)	Non	Nigeria
2	Segwat	Protection (Owo) from sicknesses, detection, and related harms	It prevents the body from easy breakdown during pandemics	OCA	Bitter	Nigeria
3	Yembayo	Prayers, Bulletproof (Ayeta), Protection (Owo)	Bulletproof against diseases like COVID-19, Affordable.	OCA	Addiction Overdose/	Nigeria
4	MBeauty	No spiritual knowledge but recommends BK to clients	A client spiritually healed of a chronic Ulcer and Affordable	OCA	Overdose Oligospermia	Cameroon
5	DrJulius Clergy	Prayers, Dowry payment in marriage	Motivates BK use for Ebola, Type II Diabetes, and COVID-19	OCA	Overdose Abuse	Cameroon
6	GH Herbalist	Ancestral Connections, Spiritual Connection with Herbs' Spirits	Spiritual prayers with BK precede all herbal treatments and cures.	OCA	Abuse	Ghana
7	MrIsaac	Attracts Goodluck and Opportunities	Spiritual value motivates medication use	OCA	Heartburn	Ghana
8	MAodu Herbalist	Medium of Enquiry (Past, Present and future), Ancestral connections, Serve as Opele (Divination Chain).	BK spiritually repels snakes and is, therefore, used as local anti-venom in treating snake bite	OCA	Addiction	Nigeria
9	PAdeG Pastor, Herbal Consult	Prayer element for Weddings and Naming ceremonies,	Spiritual awareness leads to applying BK as an Anti-poison and Antibiotics	OCA	Immeasurable Overdose	Nigeria
10	Lady Matlala	Used BK as recommended by an Herbalist to cure Ulcer	Motivated by spiritual value to cure Ulcer	OCA	No idea	South Africa
11	TJBro	Invocation of Spirits and Prayers in Naming and wedding Ceremonies,	Spiritual value is the motivation for medical use of BK.	OCA	Addiction	Nigeria
12	Olusegun	Offering for Sango Worship, incantations of Oesophagus healing	Spiritual incantations motivate BK use for Oesophagus healing	OCA	Addiction	Nigeria
13	SBDosu	Food for the god of thunder and Herbal remedy for medical conditions	Cures Ulcer, Cough, and Sexual Dysfunction.	OCA	Non	Nigeria
14	AlagStore	BK deflects spiritual attacks and is used in prayers for a long life.	Its spiritual power of long life motivates its medical use.	OCA	Abuse Addiction	Nigeria
15	NpaSey Pastor, formerly in ATR	Worship and sacrifice fruit for the god of thunder and lightning and a spiritual cure for body afflictions.	Used as antibiotics and recommended for COVID patients because it has healing powers.	OCA	Addiction	Nigeria
16	African-FS	Contains spiritual healing powers and an eyewitness of the use of BK to cure Diabetes and Poisons.	Spiritual power leads to sales traffic to cure poisons.	OCA	Addiction Dry throat	Ghana

While individuals' opinions are summarised here in Table 3, more specific details are presented below. The first seven presented are the clergies and herbalists, followed by the other nine sellers.

4.2.1. Clergies and Herbalists

Yembayo asserts that BK is a spiritual element that covers secrets in Yoruba's traditional religion. It is called *Asiri bibo*. When BK is consumed with the back peels, it spiritually protects the consumer from shame associated with poverty and sometimes attracts blessings. It also facilitates *Owo*, meaning protection from evil or escape from danger. It also serves as *Ayeta*, which is interpreted as bulletproof when mixed and consumed with alligator paper. *Yembayo* strongly opines that such spiritual safeguarding power is heavily relied upon by consumers as bulletproof against pandemic outbreaks like COVID-19. This is why consumption and sales traffic were high during the pandemic.

TJBro was born into an herbalist's family and shares some of the traditional incantations representing the power of BK. In a wedding, the incantations are "*Egbo eto ebarayin kale*; a Yoruba prayer meaning the couple will live long together and forever like BK. In a naming ceremony, *Wa Gbo Wa To* is the incantation, meaning the child will grow and live long like BK. In *TJBro*'s opinion, most people do not take the medical value of BK seriously until they are informed about its spiritual potency. *TJBros* further debunks the immeasurability of consumption quantity. He argues that *Osuwon* (scale) in Yoruba culture is used in herbal circles to determine the quantity of consumption needed to complete a healing process.

GH Herbalist is clear about using BK to connect with ancestors. For example, when someone dreams of receiving BK, it means the ancestors are delivering a message or a gift as soon as possible. In his experience of traditional healing, prayers must be offered before BK is harvested for healing and offered to patients as healing herbs; otherwise, the herbs will be ineffective. Prayers help herbalists connect to the healing powers and spirits in the tree, plant, or forest.

Olusegun, a herbalist and practitioner of African Traditional Religion (ATR), participates in Sango worship. He claims BK is offered to *Sango* (God of lightning and thunder) as a sacrificial offering. BK to Sango is an appeal offering preceding the invocation of the Spirit of Sango for protection and execution of vengeance against the worshippers' enemies. In traditional healing, the words *Mo ti jorogbo ki ohun mi le gbo* in the Yoruba language are an incantation to connect to the spiritual value of BK to cure cough, flu, and oesophagus-related ailments. It means "I have consumed BK to make my voice healthy, strong, lasting, and powerful". These incantations connect to the clearing and cleansing of the throat and related oesophagus problems. In *Olusegun*'s opinion, these incantations are a major motivation for those who use BK to cure cough and flu, cracked throat and lost voice. *Olusegun* asserts that many people in Sunnyside and beyond subscribed to this spiritual connotation in response to COVID-19 symptoms like cough, flu, throat clearing and cleansing.

Npasey is a Pastor in Sunnyside and a former ATR practitioner. In his former religious tradition, he witnessed the use of BK in Sango worship (God of thunder) to invoke the deity's spirit. Given his pre-existing knowledge of the power of BK, he still consumes the fruit for healing, and his wife sells the product. He connects the healing power of the fruit to the scriptures, claiming that BK and many African leaves and fruits are for the healing of the nations (Revelations 22:2). He recommended the product for his members during the COVID-19 pandemic. However, as a Christian clergy, he distanced himself from Sango worship.

Dr Julius is a Baptist Clergy in Sunnyside, who hails from Cameroon. His opinion remains that BK is a prayer tool in African tradition. He was an eyewitness to the use of BK to reverse Type II diabetes. He notes that a good number of his congregation used BK as a throat-clearing and cough remedy during COVID-19.

Padeg, a pastor and herbal healing consultant, believes that the attachment of BK to idol worship only by some factions of the Christian faith is not a true reflection of the whole essence and use of BK. Pastors' refusal to recommend BK to their members is a rejection of the creation of God. He holds that if pastors subscribe to allopathic medicine and reject African organic alternatives, such action reflects a double standard. If BK is organic, its use for healing purposes does not contradict the scriptures, therefore he recommends it to his congregants when the need arises.

4.2.2. Other Sellers

In highlighting some specific points, *Segab* and *Segwat* agree that BK has healing powers and that some consumers eat BK to escape drinking test detection while driving under the influence of alcohol. *Mbeauty* does not know the spiritual value of BK but attests to the medical and economic value. *Mr Isaac* opines that BK spiritually attracts good luck and creates opportunities when blended with Bay leaves, soaked in water for 7 days and used for a bath. *Maodu* asserts that BK is a medium of spiritual inquiry used by Seers in ATR into the past, present and future. Also, Necromancers use it to speak to the dead and ancestors. Maodu further claims that BK has spiritual powers that repel snakes and therefore functions as anti-venom.

Matlala, a South African who had no spiritual knowledge was treated by an herbalist using BK soaked in hot water for 2 weeks. The initial plan was to undergo surgery, but after the herbal treatment, she recovered and cancelled the surgery appointment. Her testimony influenced her involvement in selling BK and placing spiritual value on the fruit. *SB Dosu* claims he has a handful of South African retailers who resell in other locations and villages to cure ulcers, coughs, and sexual dysfunction. He claims BK is the 'food of the god of thunder'. *Alagstore* claims he uses BK in daily morning prayers to appeal to spiritual entities for speedy favour and uses BK for spiritual consultation while attending to his clients.

Africanfs was an eyewitness to some customers' healing experiences using BK. He argues that the spiritual powers of BK are invoked to ward off snakes and to treat snake bites. He also claims to be an eyewitness of a healing experience where a customer poisoned with a *muti* (black magic substance) in a beer parlour vomited the poison after consuming pieces of Bitter Kola for a few days. He claims that sales traffic during COVID-19 was due to the significant spiritual powers attached to BK.

Overall, it is important to mention that 87.5% of participants hold a strong opinion that the spiritual value of BK influences their traditional and spiritual responses to COVID-19 and related illnesses. In addition to the influence of spirituality, all interviewees agree that Bitter Kola's medical value, organic nature, easy access, and affordability increase the desire for such a traditional and spiritual response.

5. Discussion

Bitter Kola (BK) was listed among the priority species for conservation in the Sub-Saharan Forest Genetic Resources Programme ([Sacande and Pritchard n.d.](#)). It was also selected as one of six preferred tree species by the World Agroforestry Centre (ICRAF) for domestication in West and Central Africa ([Franzel and Kindt 2012](#)). Despite these domestications in 2004 and 2006, the consumption and popularity of the product seemed to be moderate until COVID-19 struck. The logical question, then, is why was there a sudden surge in subscriptions and consumption during the COVID-19 pandemic? Obviously, amid the fear, recurrent death, and rapid spread of the pandemic, the quantitative and qualitative results in the previous section indicate that some Africans were motivated to switch to spiritual and traditional alternatives for prevention and cure during and after the pandemic. On account of this background, this section will be presented in three categories. These include spiritual motivation, medical motivation, and the pros and cons of using BK vis-à-vis the data results presented.

5.1. Spiritual Motivation

Variable A in Table 2 and Figures 4 and 5 all depict the motivation behind consumption and sales during and after COVID-19. The regression analysis in Figure 5 suggests a statistically significant relationship between consumers' motivation or influence and sales period (before, during, and after COVID-19). On the other hand, the coefficient estimates indicate insignificant errors. These analyses and interpretations show validity and reliability and support the hypothesis implying a spiritual influence behind consumers' use of BK in response to the COVID-19 pandemic. Furthermore, Variable B and Figure 6 establish that traditional spirituality influenced about 60.9% of consumers' response to COVID-19, while the remaining 39.1% who had no clue of the spiritual value of BK may be influenced by BK's medical value. The medical motivation was also confirmed in Figure 7, with COVID-19 symptoms being the highest health condition for consumption.

Consequent to the variation between spiritual and possible medical influences, this article infers from the analysed data that consumers leveraged the spiritual value of BK in their traditional response to COVID-19. The article further observes synonymity between the quantitative and qualitative results presented. In the qualitative results, 87.5% of participants strongly opined that the indigenous spirituality of the participants influences their consumption of BK and informs their traditional medical response to COVID-19 and related symptoms. Given that the interviewees are herbalists, spiritualists, clergies and sellers with practical experience of the value of BK, the results from the interviews are as valid and reliable as the linear regression analysis asserts in the quantitative results. Thus, it is concluded that spirituality influences the decisions of participants as they respond to the pandemic using BK.

Furthermore, the conclusion above is not in isolation; other earlier researchers agree that spirituality cannot be jettisoned in healthcare. For example, [Borges et al. \(2021, p. 1\)](#) conducted research on religious influence on decision-making in Brazil with a total of 1133 participants, of which non-religious participants were only 11.9%. The outcomes show that 45.2% are influenced by religious affiliations in health-related decisions and accepting medical recommendations. Likewise, [Advent Health University \(2020\)](#) submits that cultural sensitivity plays an important role in the relationship between religion and healthcare because patients will make decisions based on their cultural identity, including religion. In the opinion of [Oman and Thoresen \(2002\)](#), there are four prominent pathways in which religion influences health: health behaviours, social support, psychological states, and 'psi' influences. The 'psi' speaks to the supernatural laws that govern 'energies'³. Interpretively, since spirituality and religion influence health through these pathways, they act indirectly on health (cf. [Rumun 2014](#)).

In African religious tradition, it is believed that BK is predominantly used as a spiritual element to resolve natural, medical, or spiritual challenges. It is then not surprising that most participants leveraged their spiritual experience and knowledge of BK in response to COVID-19 and related health challenges. Besides COVID-19, Africans believed that sexual dysfunction and infertility transcend medical challenges; hence, BK is domesticated as a spiritual cure. For example, the Shina people of Mhondoro-Ngezi in Zimbabwe believe male infertility is spiritual, ditto some traditional beliefs in Nigeria. Although medical science shows that BK can reduce oestrous with the production of 70% blockage to ovulation, in African tradition, BK cures sexual dysfunction and infertility ([Public Health Nigeria 2022](#)). This fertility assertion has also been evaluated and confirmed to improve the sperm quality production of juvenile African catfish, scientifically known as *Clarias gariiepinus*. ([Olaniyi 2020](#), pp. 1–5).

More importantly, since consumers' spiritual knowledge activates their faith in using BK as an alternative health remedy, it is suggested that spirituality and psychology could meet here. While psychological motivation is not the focus of this article, one can infer that spiritual knowledge can impact the psychological behaviour or decisions of BK consumers. This argument can be sustainable because it is common knowledge that decisions are important in psychological treatment, and some patients like to talk about their faith during

treatment. Emerging pieces of research also show that spiritually integrated approaches to treatment are as effective as other treatments (Pargament 2013). This is because spiritual intelligence influences human psychology and health behaviours (Sargeant and Yoxall 2023, pp. 1159–74; Zaidi 2018, pp. 609–12; Vajpayee 2016; Puchalski 2001, pp. 352–57). Therefore, it is the opinion of this research that in answering the research question on how spirituality influences the consumption of BK, it can be inferred that spirituality can trigger psychological actions and decisions of BK consumers in response to healthcare challenges. It is therefore suggested that there is an interconnectedness of spirituality, psychology, and healthcare in the face of challenges like COVID-19. In other words, Indigenous spiritual knowledge can influence healthcare behaviour.

5.2. Medical Motivation

In Figure 7, participants assert they use BK for 15 medical conditions. Among them, 72% use BK in treating coughs and flu; 32% use it to control blood pressure; 26.7% use BK as a chest pain remedy, and 37.3% use the product in curing cracked voice and throat pains. All these are COVID-19-related ailments. In the quantitative summary in Tables 1 and 2, most participants testified that BK has a spiritual power that translates into medical values. All the health conditions listed in the quantitative results in Figure 7 were equally attested to by the qualitative results in Table 3. Such homogeneity of results from respondents' opinions hypothetically suggests that the spiritual knowledge of the participants influences their healthcare decisions.

Further, the respondents' common opinion is not exclusive to this research. Earlier research shows that BK contains caffeine and theobromine, thereby increasing the heart rate and improving circulation. As a stimulant and diuretic, it also boosts energy and helps to reduce asthma symptoms. It also has healing properties that can reduce the risk of prostate cancer and block the growth of harmful bacteria (InformativUpdate 2023). Additionally, it contains anti-inflammatory elements that can lessen the high risk of acute cardiovascular complications and thereby reduce the risk of death. In other words, consumption of BK is likely to promote long life as it concerns cardiovascular conditions. The report of Public Health Nigeria (2022) reveals that the assumption of the long-life potentials of BK is also ascribed to its divine powers for longevity. Fondoun and Tiki Manga (2000, pp. 289–302) also agree that both cardiac glycosides and steroidal compounds in BK extracts coincide with the African traditional application of the product in combating chest pain or cardiac infection (cf. De Pietro 2017). This claim is also confirmed in Figure 7 above, where 26.7% assert they apply BK in chest pain treatment. Overall, the quantitative and qualitative results and earlier existing literature affirm the medical value of BK. However, the affirmations have spiritual and traditional influences.

5.3. Pro

In Table 3, qualitative results and analysis provide the advantages and disadvantages of consuming BK. Further, *Variable C* (Consumption Sales/Sales Frequency) under quantitative results inferred other advantages, as seen in Figure 8. The following is a summary of the advantages.

- a. **Organic, accessible, affordable, and curative:** All interviewees assert that BK is valuable based on four indices: its organic nature, accessibility, affordability, and curative contents. Besides spiritual influence, these appear to be good reasons for subscription, as participants believe BK is more user-friendly based on these indices. Thus, poor healthcare delivery and high costs make traditional medicines influenced by spirituality a good healthcare alternative. Iwu and Gbodossou agreed with this assertion when they claimed that
 “Herbal-based therapies, once used only in traditional medical systems, are now recommended for the treatment of several degenerative disorders and chronic conditions where modern pharmaceutical agents have proved inadequate. The acceptance of these techniques as standard healthcare options will have a tremendous impact on

the cost of healthcare interventions, preventive medicine, and self-healing". (Twu and Gbodossou 2000, p. 3)

- b. **Economic value:** The graph in Figure 8 above points to the monthly purchases of BK by consumers. It indicates that BK has created some market value for wholesalers and retailers and boosts the economy of African nations via import and export businesses because the product is imported from West Africa. Also, the monthly selling rates show how consumers make self-medication part of their monthly budget and expenditure. This implies that responsiveness to healthcare in a traditional way, influenced by African spirituality, improves Africa's economy. The surge in BK monthly purchases during and after COVID-19 suggests that BK and related African fruit sellers may be enjoying some form of market share in the monthly Medicare plans of many families in Pretoria, South Africa.
- c. **Positive reaction to health conditions:** During COVID-19, quarantining patients makes people unwilling to disclose their COVID-19 status. The fear of death and quarantine (nosophobia) triggers interest in alternative healing. Rather than approach medical professionals, some people resorted to traditional fruits like BK, influenced by the indigenous spiritual significance, to achieve preventive and curative healing support privately without having to be quarantined.
- d. **Acceptance across religions:** Among all participants, there are Christian and Islamic Clergies, as well as practitioners of African Traditional Religion (ATR). The clergies consume BK and recommend the product to their congregants and clients, especially during and after COVID-19. Most of the Islamic and ATR participants take the same position by supporting the spiritual and medical values of BK. One clergy particularly asserts that BK, among other fruits, is for the healing of the nations (Rev. 22:2). Consequently, there is a growing acceptance and convergence of positive opinions about the spiritual value of African fruits across religions. Thus, indigenous knowledge systems and spirituality in healthcare can foster ecumenism and inter-religious relations in the interests of health and well-being in human society.

5.4. The Cons

In Table 3, there seems to be a consensus regarding the measurement of the quantity of consumption. This calls for worry in medical health systems. Likewise, the data in Figure 8 show that over 40% of consumers use BK randomly. Table 3 further expresses some significant disadvantages of the immeasurability of BK consumption. These include overdose, which can lead to addiction, Oligospermia, Heartburn or gastroesophageal reflux (GER), among others. These disadvantages cannot be overlooked, as about 93.8% of the qualitative research participants agree on the side effects.

6. Research Limitations

The research is limited to Pretoria, with participants from seven countries. However, there are other locations in South Africa and around Africa where BK is used. More so, Africa has 54 countries, and this research outcome cannot speak for all of Africa. While there may be a general indigenous knowledge system in African spirituality, it stands to reason that all African indigenous knowledge may not apply to all African spiritual traditions. There are possibilities for specific and diverse indigenous knowledge systems that may interpret the spiritual value of BK differently. Furthermore, while COVID-19 is central to this research, other diseases are spiritually and traditionally attended to in African spiritual traditions. Therefore, this article provides room for further investigation into the spiritual influence of BK and other African fruits across African countries and cultures. Additionally, it is critical to consider the scientific limitation of the hypothesis confirmed by the respondents. The idea of considering Bitter Kola as a healing substance has not been approved by medical health groups like the World Health Organisation or scientifically proven as a curative measure for COVID-19. However, it can be argued that given the chemical composition of the fruit, it may serve as a preventive but not a curative

element for COVID-19. This is evident in the respondents' testimonies in Figure 7. Thus, this article does not claim that BK cures COVID-19.

For further research, one of the reviewers of this article made an important point on the need to discuss how BK reshapes our understanding of medical knowledge. While this is not the core focus of this research, the submission provides a gap for further investigations. Thus, this research provides a platform for readers and related researchers to explore how African fruits like BK in ethnomedicine are reshaping the complex interplay between health, community, and spirituality.

7. Lessons

Regardless of the limitations, there are lessons in this research. First, as claimed by the respondents, spirituality has a major influence on some Africans' approach to managing health challenges. Second, in a post-COVID-19 era, as the world adjusts to the new normal, Africans, in their indigenous spiritual experiences, are scaling up their faith and domesticating spirituality in tackling new challenges in healthcare. Therefore, higher sensitivity to African spirituality is part of the new normal in the post-COVID era. Third, the spiritual and traditional approaches also have positive economic implications for healthcare and well-being. Fourth, the continuous high consumption of BK after the pandemic, as evident in the linear regression in Figure 8, suggests a recovery from the poor response to healthcare. Regardless of the cost of healthcare, Africans are developing a sense of alternative healthcare and self-care motivated by spirituality. Fifth, Indigenous knowledge systems of spirituality in healthcare can foster ecumenism and inter-religious relations in the interests of health and well-being. Sixth, this research shows that BK has spiritual and medical connotations beyond COVID-19 and related illnesses. It shows hypothetical values in anti-erectile dysfunction, anti-snake bite (anti-venom), and the cure of diabetes type II, among others. This then implies the need for further research. Lastly, these lessons cannot be complete without mentioning that spirituality cannot be ignored in healthcare matters, especially in fulfilling the Sustainable Development Goals 3 and 17 of the United Nations.

8. Conclusions

This article hypothesised that Bitter Kola (BK), as an African fruit, has spiritual values that influence the healthcare decisions of Pretoria residents in response to the COVID-19 pandemic. To validate the hypothesis, it provided evidence from 75 consumers and 16 clergies, herbal consultants and sellers in Sunnyside, Pretoria, South Africa. The article confirmed from quantitative and qualitative data analyses and interpretations that participants' indigenous spiritual knowledge of BK influenced their responses to COVID-19. With the pieces of evidence, it argued that the spiritual value of BK is user-friendly during the pandemic because it is accessible, affordable, organic, and curative. Also, it briefly touched on how spirituality and psychology meet in response to the pandemic; the article argues that BK accessibility and affordability can help bridge the gap between the high demand and low supply of healthcare in Africa. Besides these positive effects, this article argued that using BK opens a gap for abuse via overdose and addiction. Although one interviewee argued that *Osuwon* (scale) in African healing tradition addresses the problem of immeasurability of consumption, the position of this article is that one contrary opinion among many complaints on immeasurability may be insignificant. The article, therefore, submits that spirituality does not deny, address, or protect consumers from the possibility of abuse.

On a final note, this article calls for three necessities. First is the need for greater consideration of the role of religion and spirituality in healthcare. Secondly, since the limitation of the study suggests that using BK is not scientifically proven as a cure for COVID-19 and related illnesses, it is strongly advised that consumers consult medical professionals, and African herbalists should refer patients to healthcare professionals when necessary. Thirdly, there is a need for synergy between traditional medications and pharmacology to address the problems of immeasurability of dosage, overuse, and abuse.

Author Contributions: Conceptualization, D.O.; methodology, D.O.; formal analysis, D.O.; investigation, D.O.; writing—original draft preparation, D.O.; writing—review and editing, H.G.K.; All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Institutional Review Board Statement: The study was conducted in accordance with the research policy of Higher Education in South Africa and approved by the Ethics Committee of the Faculty of Theology and Religion, the University of Pretoria. With application number T087/23 approved on 12 January 2024.)” for studies involving humans.

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: The Google questionnaire with evidence of the consent of participation response and all data collected are available at https://docs.google.com/forms/d/1CkCorO-k5x9UCU6ZWgsQAhtfDqh_FhUE9JhNNYTCD2k/edit#responses (accessed on 30 January 2024).

Conflicts of Interest: The authors declare no conflict of interest.

Notes

- ¹ The American Heart Association alludes that 21% of people hospitalised with COVID-19 and 11% of those who were not hospitalised for COVID-19 developed high blood pressure, compared to 16% of people hospitalised with influenza and 4% of those not hospitalised for influenza. See [American Heart Association \(2023\)](#). [Ada’s Medical Knowledge Team \(2023\)](#) also delineated Chest Pain as a symptom of COVID-19.
- ² Throat pain is also a COVID-19 symptom in the reports of [Tee-Melegrito \(2021\)](#).
- ³ PSI is the unknown factor in extrasensory perception and psychokinesis experiences that is not explained by known physical or biological mechanisms. This unknown factor is spiritual and not currently comprehended by science but possibly understandable at some point by science. See “APA Dictionary of Psychology.” (2018). [Dictionary.apa.org](https://dictionary.apa.org/psi). <https://dictionary.apa.org/psi>. (accessed on 30 January 2024).

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