

ORIGINAL ARTICLE

**Perceived Effectiveness and Safety of *Cassia angustifolia* (Senna Makki) in the Treatment of Coronavirus Disease Of 2019 (COVID-19): A Population Based Qualitative Study**

Imtiaz Bashir<sup>1</sup>, Azal Ikhlaq<sup>1</sup>, Farhat Ijaz<sup>1\*</sup>, Aiza Anwar<sup>1</sup>, Avais Ahmad<sup>2</sup>, Rana Khurram Aftab<sup>3</sup>, Aizaz Ul Haq<sup>4</sup>, Amna Aizaz<sup>5</sup>

1: CMH Lahore Medical College & Institute of Dentistry (NUMS), Lahore, Pakistan

2: Continental Medical College, Lahore

3: Punjab Institute of Cardiology, Lahore, Pakistan.

4: Akhtar Saeed Medical College, Lahore, Pakistan

5: Nawaz Shareef medical college, Lahore, Pakistan

Corresponding Author: \*Farhat Ijaz, MPhil.

Email: [farhat\\_khurram\\_rana@cmhlahore.edu.pk](mailto:farhat_khurram_rana@cmhlahore.edu.pk)

ABSTRACT

COVID-19 pandemic has caused wide devastation across the world. There is a plethora of information and misinformation on social media regarding drugs and treatment for it. *Cassia angustifolia* (Senna Makki) is being used now a days in the treatment of COVID-19 and is described effective by a group of people on Social Media and negated by others. Our literature review reveals the presence of compounds such as Emodin, Salicylic Acid, and Anthraquinone in it which have been shown in other studies to be quite effective against COVID infection. This study was done to assess the perception of the COVID-19 recovered patients about the safety and effectiveness of Senna Makki in the treatment of their disease. This was an interview based qualitative study conducted at Punjab, Pakistan. Data were presented in frequency and percentages. The majority of participants perceived it to be ineffective in the treatment of the disease due to the development of diarrhea after using it. The study describes a negative perception of people about the effectiveness of Senna in the treatment of COVID-19. This perception is likely due the development of diarrhea by using it. However, the presence of compounds having potential effectiveness against coronaviruses in it suggests further studies to evaluate the effectiveness of its extracts and its efficacy when given under the coat of anti-diarrheal medicines.

**Keywords:** *Cassia angustifolia*, COVID-19, Effectiveness and Safety, Senna Makki

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**INTRODUCTION**

Coronavirus Disease of 2019 (COVID-19), sprouting from Wuhan China in early December of 2019, has now been prevalent in 213 countries with 75,53,182 endorsed cases and 4,23,349 deaths worldwide. As of now, there are 139,229 confirmed cases and 2632 deaths in Pakistan [1]. COVID-19 is a disease which most commonly presents as cough, fever, and atypical pneumonia and is caused by a positive-sense enveloped RNA virus; SARS-2-Coronavirus (SARS-CoV-2) [2]. Due to the worldwide panic and devastation it caused, there have been extensive research on it to find out a cure for it. There is no approved curative drug for it yet except for Remdesivir which is known to be effective in early stage of the disease [3].

As the pandemic prevails, there is a plethora of information and misinformation on social media regarding the onset, prevalence, and medication of the disease [4]. One the most viral advice regarding the treatment of COVID-19 spreading nowadays on internet is the use of a herbal medicine Senna Makki. There are several claims on internet regarding its efficacy to check the disease. However, it is unproven and is a matter of discussion among doctors [5]. Some authorities claim that due to its laxative nature, it can be harmful and further worsen the disease [6].

Senna Makki (*Cassia angustifolia*) is a drought resistant herb, native of Saudi Arabia and is now grown worldwide. Various species of Cassia are also used as Chinese Traditional Medicines. It is used as a febrifuge in splenic enlargements, anemia, typhoid, cholera, and as a toxin remover. It is also used in the treatment of constipation, ameboid dysentery, as an anthelmintic and as a mild stimulant. Bronchitis, dysentery, fever, hemorrhoids, and fevers are being treated by extract of the plant [7].

Researchers have been done to find out the chemical composition of Senna, various compounds identified in it are Sitosterol, Sennosides A,B,C, anthraquinone, Cathartic acid, Rhamnetin, gluco-sennin, , chrysophenic acid, nigrin, kaempfrin, rhein, flavonoids, emodin and salicylic acid [7-9]. Based on its chemical composition, several medicinal effects (like purgative, antibiotic, anti-malarial, anti-cancer, antipyretic, antioxidant, anti-inflammatory etc.) of Senna are described and studied [9].

The presence of the compounds; Emodin, Salicylic acid and anthraquinone are a point of attraction for us. Emodin has been recognized as a compound having effective antiviral activity against coronaviruses [10] such as SARS-CoV-2 [11] because it blocks the interaction between viral spike protein and ACE 2 receptors. Inflammation [12], venous and arterial thromboembolic complications [13] are associated with COVID-19, that is why anti-inflammatory drugs are also prescribed in its treatment [14]. The compounds in Senna might serve anti-inflammatory as well as anti-oxidant functions i.e. Salicylic acid (acetyl salicylic acid is commonly known as aspirin) serves the anti-inflammatory as well as anti-coagulant function thus may reduce the chances of development of Disseminated Intravascular Coagulation (DIC). Anthraquinone serves the antioxidant function thus may help to mitigate the oxidative stress that is produced in COVID-19 [9].

The presence of these compounds in Senna suggests its potential role as a medicine in the treatment of COVID-19. Such medicinal herbs have been used as complementary or alternative medicines worldwide since long [15]. WHO persuades the study of efficacy and side effects of medicinal herbs because of inclining of people towards them and potential side effects of many synthetic medicines.<sup>16</sup> Motivated by these things, our aim was to catalogue the methods of use, safety, and perceived impact of Senna Makki amidst COVID-19 treatment relying on the individual experiences and observations of the people using it.

## **MATERIAL AND METHODS**

### **Justification of sample size and research methodology**

To calculate sample size in qualitative research, it should be based on the purpose of research, knowledge, and experience [17]. Related studies conducted on the perceived effectiveness of other herbal medicines in other scenarios have used 20, 23 participants [18, 19]. The saturation point was regarded max out when no new themes were evidently turning out. Based on these points, we were confident with a sample size of 20, however due to lack of communication during lockdown we could access only 15 patients. Still, saturation point was achieved. For conducting this study, qualitative research methodology was selected, as it provides convenience in the collection of appropriate, rich and comprehensive information, allowing researchers to explore the approach and perspectives of individuals in the context of their personal circumstances [20-22].

### **Inclusion and exclusion criteria**

Patients were selected from Punjab, Pakistan by convenient chain (snowball) sampling. People recovered from COVID-19 (having test positive and after treatment at least one test negative) who have used Senna in their course of treatment were included. Asymptomatic patients were excluded.

### **Data collection**

Detailed semi structured interviews were conducted with people recovered from COVID-19 and have used Senna in their course of treatment. The ethical approval was given by Ethical Review Board of CMH Lahore Medical College. Before interviewing, participants were convinced that the study did not aim at advocating or discouraging the use of any medicines or choice of therapy, but rather to analyze participants' personal experiences and views about that particular treatment. An interview guide (10 closed-ended questions; seven open-ended questions) was used and to ensure the clarity of the questions, it was validated through Face Validation and pilot testing on two COVID-19 recovered patients. Taking in view the ease of participants, they were allowed either to give an interview on phone call or to write their responses on interview guides. 15 participants agreed to take part in the research and responded on the interview guides. The identity of the participants was veiled, and codes were used in the analysis to prevent any bias.

### **Data analysis**

Descriptive analysis was used to analyze participants' responses to closed-ended questions. Data collected on 'the form(s) of Senna Makki used, reasons for use, sources of recommendations and information resources, dosage administered, commencement and duration of administration' was

summarized. The thematic analysis as described by Boyatzis [23] was used to analyze opened-ended questions in the interview guide that explored the experiences and perspectives of participants. Statistical analyses for the close ended questions were performed using the Statistical Package for Social Sciences (SPSS) version 25. Descriptive statistics was applied. Data was presented in frequency and percentages.

## RESULTS

Tables 1, 2, and 3 give the details of responses. Majority of the participants were male (66.6%) and the major source of information (60%) was through social circle (family, friends etc.) All the participants took it in the form of Qehwa (tea). Dosage was 1 teaspoon in the form of Qehwa (tea) twice a day for majority (86.6%) of the participants. Most of the participants started using it at the time of diagnosis and continued the treatment for varying durations (for 1 day minimum to 17 days maximum). 80% of the participants considered Senna Makki to be ineffective in the treatment of COVID-19. Two participants were not sure about its effects while only 1 person perceived it to be effective. 80% of the participants were not comfortable using it and developed adverse effects like diarrhea and stomach diseases. 20% (n=3) of participants reported no side effects. Most of the participants (73.3%) were not confident about the safety of its use. Almost all of the participants left using it because of associated diarrhea. Results Tables 1, 2, and 3 give the details of responses. Majority of the participants were male (66.6%) and the major source of information (60%) was through social circle (family, friends etc.) 80% of the participants considered Senna Makki to be ineffective in the treatment of COVID-19. Almost all of the participants left using it because of associated diarrhea.

**Table 1: Participant characteristics**

Item	Frequency (Percentage)	
<b>Gender</b>		
Male	10	(66.6%)
Female	5	(33.3%)
<b>Source of information</b>		
Internet	5	(33.3%)
Social media	4	(26.6%)
Family/friends	9	(60%)
<b>Perceived Effectiveness</b>		
Not effective	12	(80%)
Effective	01	(6%)
Not sure	02	(13%)
<b>Perceived Comfort</b>		
Not Comfortable	12	(80%)
Comfortable	03	(20%)
<b>Adverse Effects</b>		
Diarrhea/Stomach issues	12	(80%)
None	03	(20%)
<b>Confidence About Safety</b>		
Confident	2	(13%)
Not confident	11 (73.3%)	
Little bit confident	1 (6%)	
Not sure	1 (6%)	

**Table 2: The source of recommendation and pattern of use of Senna by the participants.**

Participant	Information Source	Form Taken	Dosage used	Start of therapy	Therapy Duration
P1	Internet	Qehwa	1 tablespoon	At diagnosis	Taken 2 times a day for 14 days
P2	Internet	Qehwa	1 tablespoon	At diagnosis	Taken 3 times a day for 14 days
P3	Social Media, family/friends/relatives	Qehwa	1 tablespoon	At diagnosis	Taken 2 times a day for 02 days
P4	Social Media friends	Qehwa	1 tablespoon	1,2 days after diagnosis	Taken 2 times a day for 03 days
P5	Social Media	Qehwa	1 tablespoon	1 day after diagnosis	Taken 2 times a day for 03 days
P6	Internet	Qehwa	1 tablespoon	At diagnosis	Taken 2 times a day for 04 days
P7	Family	Qehwa	1 tablespoon	At diagnosis	Taken 2 times a day for 04 days
P8	Family	Qehwa	1 tablespoon	At diagnosis	Taken 2 times a day for 04 days
P9	Family	Qehwa	1 tablespoon	At diagnosis	Taken 2 times a day for 04 days
P10	Social Media	Qehwa	1 tablespoon	3 days after diagnosis	Taken once a day for 3 days
P11	Internet	Qehwa	1 tablespoon	At diagnosis	Taken 3 times a day for 17 days
P12	Friends	Qehwa	1 tablespoon	At diagnosis	Taken 2 times a day for 7 days
P13	Family, Friends	Qehwa	1 tablespoon	At diagnosis	Taken 2 times a day for 5 days
P14	Internet	Qehwa	1 tablespoon	1 day after treatment	Taken 2 times a day for 01 day
P15	Friends	Qehwa	1 tablespoon	At diagnosis	Taken 2 times a day for 5 days

## DISCUSSION

This study uncovers the mindset on the use, perceived effectiveness, and safety of Senna Makki amid the treatment of COVID-19. The majority of participants perceived it to be ineffective in the treatment of the disease due to the development of diarrhea after using it. The development of an adverse side effect might have affected the patient's viewpoint about the effectiveness of the medicine. 3 participants did not report any side effects (might be due to the use of some side medicine or some innate protection against development of side effects which were not addressed during the interview and are a limitation of this study). Likewise, they either considered it effective or were not sure about its effectiveness. It suggests that Senna used in the coat of anti-diarrheal might be effective.

The sources of information were social circle, internet and social media. Social circle is itself closely related to media. It shows a negative health attitude of the patients as all of them used it as self-medication. People use whatever they learn from media, and media may influence expectations of the people towards medication [24]. Self-medication is associated with higher risks of developing adverse effects of drugs, overdose, misdiagnosis, drug interactions and polypharmacy [25]. Same has happened in this scenario.

*Cassia angustifolia* is primarily used as a laxative and the development of diarrhea by using it in normal people is obvious. However, as discussed earlier, the presence of substances like Emodin, Salicylic acid, and anthraquinone in it suggests its potential as a medication in COVID-19. So, using it in the coat of an

anti-diarrheal medicine or using its extracts might be effective. Further studies are indicated to cover this aspect.

Small sample size and qualitative nature of this study are major limitations of this study. The personal views of the participants about Senna can result in a possible bias. Further studies should be done to evaluate the effectiveness of Senna Makki when given in the coat of anti-diarrheal. In vitro, In vivo, and *In silico* studies are indicated to check out the effectiveness of its extracts.

**Table 3: The perceived effectiveness and safety of Senna described by the participants.**

Participant	Perceived Effectiveness	Adverse Effects/Safety
P1	Not Effective I was not comfortable taking it	Diarrhea Not confident about safety
P2	Not Sure about effectiveness I was not comfortable taking it	Diarrhea Little bit confident about safety
P3	Not Effective I was not comfortable taking it	Diarrhea Not confident about safety
P4	Not Effective I was not comfortable taking it	Stomach issues Not Confident about safety
P5	Not Effective I was not comfortable taking it	Stomach issues Not confident about safety
P6	Not Effective I was not comfortable taking it	Stomach issues Not confident about safety
P7	Not Effective I was not comfortable taking it	Stomach issues Not confident about safety
P8	Not Effective I was not comfortable taking it	Stomach issues Not confident about safety
P9	Not Effective I was not comfortable taking it	Stomach issues Not confident about safety
P10	Not much effective I was comfortable taking it	No adverse effect Confident about safety
P11	Effective My throat got better I was comfortable taking it	No adverse effect Confident about safety
P12	Not effective I was not comfortable taking it	Diarrhea Not confident about safety
P13	Not effective I was comfortable taking it	No adverse effects Not sure
P14	Might be effective I was not comfortable taking it	Extreme diarrhea, pale skin, dehydration Not confident about its safety
P15	Not effective I was not comfortable taking it	Diarrhea Not confident about safety

## CONCLUSION

The study describes a negative perception of people about the effectiveness of *Cassia angustifolia* (Senna Makki/Senna) in the treatment of COVID-19. This perception is likely due the development of diarrhea by using it. However, the presence of compounds having potential effectiveness against coronaviruses in it suggests further studies to evaluate the effectiveness of its extracts and its efficacy when given under the coat of anti-diarrheal medicines.

## DATA AVAILABILITY

The authors confirm that the data supporting the findings of this study are available within the article and any additional material will be available upon request. .

## CONFLICT OF INTEREST

The authors declare no conflict of interest

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**ABBREVIATIONS:**

Coronavirus Disease of 2019 (COVID-19); SARS-2-Coronavirus (SARS-CoV-2); Angiotensin-Converting Enzyme 2 (ACE 2 ); Disseminated Intravascular Coagulation (DIC)

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