Original Article

Evaluation of Organoleptic Properties and Compliance with Marketed Cough Syrups : A Cross Sectional Consumer Survey in Indian Patients

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Background : With growing burden of respiratory symptoms, it is crucial to develop cough syrups with appealing organoleptic properties. This study investigated the consumer feedback on various organoleptic properties and patient compliance to eight leading marketed cough syrups prescribed in routine clinical practice in India.

Materials and Methods : In this cross-sectional 3-months survey, adult patients prescribed with leading cough syrups were enrolled from 8 sites. A survey questionnaire was administered to collect data on the color, taste, viscosity, mouth feel, flavor, aroma, and aftertaste of the syrups using Likert scale ranging from 1-5.The compliance with prescribed regimens were also assessed. AP<0.05 was considered statistically significant.

Results : In total, 240 participants were enrolled in this survey. The syrups were generally prescribed for dry cough, fever, headache, productive cough, shortness of breath, and sneezing. Brand C (Bromhexine+ Guaiphenesin+Terbutaline) was the most commonly prescribed cough syrups (n=47). A significant association was found between the dose frequency and duration of cough syrups across all groups (P=0.005 for both). Brand D (Ambroxol+Levosalbutamol+Guaiphenesin), Brand A (Chlorpheniramine Maleate+Dextromethorphan), Brand C (Bromhexine+Guaiphenesin+Terbutaline)received the highest responses for “I liked it somewhat” and “I liked it extremely” for different organoleptic features. 97.1% of patients had consumed the cough syrup were compliant.

Conclusions : We found that Brands A, B, C, D (marketed by Dr. Reddy’s laboratory Ltd.) were the most accepted and liked cough syrups compared to other 4 leading marketed cough syrup brands.A high percentage of patients (ie, 97.1%) adhered to the recommended dosage and duration.

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Key words **: Cough syrups, Dr Reddy’s laboratories, India, Organoleptic, Sensory properties.**

The acceptability of cough syrups to the Indian patients not only depends on its efficacy, but also on organoleptic properties such as taste, smell, color, and texture. Pharmaceutical companies often focus on developing cough syrups with appealing organoleptic properties to improve patient compliance and ultimately, treatment outcomes. Several excipients such as colors, flavors and pleasant aroma are used to enhance the palatability of cough syrups as these can significantly affect a patient’s willingness to take it, hence, play a crucial role in producing overall effectiveness. Cough syrups have varying textures from thicker and more viscous to thinner and more liquid-like, which make them easier to pour and swallow[1]. Organoleptic properties are vital as they can affect a patient’s adherence to prescribed medication and improve patient complaince[2-6]. There have been clinical studies that suggest that organoleptic properties can

Editor's Comment :

- Organoleptic properties significantly affect patient compliance and overall effectiveness of cough syrups
- Pharmaceuticals prioritize developing cough syrups with attractive organoleptic properties.
- Dr. Reddy’s Laboratory Ltd.s cough syrups (Brand A, Brand B, Brand C, and Brand D) were highly accepted and preferred, surpassing four other leading cough syrup brands in the market

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have a significant impact on patient compliance[6].

We undertook a survey to understand consumer feedback upon organoleptic properties and compliance of various leading marketed cough syrups prescribed in routine clinical practice in India. Also, we compared consumer survey response to the various cough syrups based on their organoleptic properties.

Materials and Methods

Eight leading marketed cough syrup Brands were evaluated in this cross-sectional, observational, multi-center consumer survey to provide an initial assessment of their organoleptic properties. Adult patients aged 18 years or older, who were prescribed leading cough syrups, willing to complete the survey and provide data disclosure consent, were enrolled from 8 study centers located across 2 cities in India (New Delhi and Mumbai). Patients with unsuitable medical histories were excluded from the survey.

The study was approved by an independent ethics committee via a letter dated 17 May 2022 and 22 June 2022 (CTRI/2022/06/043040). All activities related to the collection, access, processing, and transfer of protected health information or sensitive personal data were conducted in compliance with applicable regulations. Each patient was assigned a unique patient identifier.

Survey duration and data collection :

The survey had a duration of ~3 months, during which patients attended 2 visits to the site/clinic. A follow-up visit was conducted either on-site or by phone after 5 days of enrollment. Patients were contacted by phone to complete the organoleptic questionnaire, but if they visited the site/clinic for follow-up, they completed the questionnaire during their visit. At baseline, demographic data such as age, gender, city/state, height, weight, BMI, presenting symptoms, clinical signs, and diagnosis were collected by investigators or study personnel, along with comorbid diseases and vitals such as pulse rate, oral body temperature, and respiratory rate. Patients were also asked about the Brand, dosage, and duration of the prescribed cough syrup, and any concomitant medication.

Survey questionnaire :

The survey questionnaire contained a Likert scale ranging from 1-5 for participants to respond to various organoleptic properties of the syrup. These included the color, taste, viscosity, mouth feel, flavor, aroma, and aftertaste of the syrup. The scoring was mapped against the following responses: “I dislike it extremely,” “I dislike it somewhat,” “Neutral,” “I like it somewhat,” and “I like it extremely.”

Statistical analysis

Statistical analyses were performed usingR software Version 4.1.2. Descriptive statistics, such as mean and Standard Deviation (SD) are used to present continuous data. Categorical data are summarized using counts. The survey questionnaire data were presented descriptively. Comparisons were made using the Chi square/ Fisher’s exact test and t–test for categorical and continuous variables respectively. The p-value less than 0.05 was considered statistically significant.

Results

In total, 240 participants prescribed with 8 cough syrupswere enrolled. The details of ingredients for each cough syrup are listed in Fig 1. Of total participants, 122 (50.8%) were male and 118 (49.2%) were female. The mean ± SD age of patients was 45.52 ± 16.54 years and mean ± SD BMI was 26.60 ± 4.76 kg/m^2. Table 1 summarizes the demography and clinical characteristics of patients as per cough syrups. The age, gender and BMI were comparable across all eight groups (P>0.05).

Table 1 — *Summary of demographic characteristics and clinical characteristics as per cough syrups*

	Brand A (n=28)	Brand B (n=26)	Brand C (n=47)	Brand D (n=27)	Brand E (n=28)	Brand F (n=28)	Brand G (n=29)	Brand H (n=27)	P-value
Age (years)	46.75±16.81	42.35±17.67	48.74±18.31	45.63±17.44	46.57±16.27	47.11±15.08	41.76±15.84	42.89±14.01	0.6128
Gender, n (%)									
Female	9 (32.1)	18 (69.2)	22 (46.8)	14 (51.9)	14 (50.0)	14 (50.0)	15 (51.7)	12 (44.4)	0.3371
Male	19 (67.9)	8 (30.8)	25 (53.2)	13 (48.1)	14 (50.0)	14 (50.0)	14 (48.3)	15 (55.6)	
BMI	26.52±4.22	25.28 ± 4.87	26.63 ±5.05	28.37 ± 5.58	27.12 ±4.48	25.42 ±3.37	26.23 ±3.79	27.26 ±5.98	0.2955
Presenting Symptoms, n (%)									
Dry Cough	26 (92.9)	19 (73.1)	21 (44.7)	13 (48.1)	25 (89.3)	23 (82.1)	14 (48.3)	8 (29.6)	<0.0001
Fever	10 (35.7)	8 (30.8)	17 (36.2)	9 (33.3)	13 (46.4)	9 (32.1)	14 (48.3)	15 (55.6)	
Headache	2 (7.1)	6 (23.1)	13 (27.7)	5 (18.5)	8 (28.6)	7 (25.0)	8 (27.6)	5 (18.5)	
Productive Cough	2 (7.1)	5 (19.2)	23 (48.9)	15 (55.6)	1 (3.6)	5 (17.9)	15 (51.7)	19 (70.4)	
Shortness of breath	0	4 (15.4)	6 (12.8)	4 (14.8)	2 (7.1)	4 (14.3)	2 (6.9)	1 (3.7)	
Sneezing	9 (32.1)	8 (30.8)	16 (34.0)	8 (29.6)	8 (28.6)	13 (46.4)	7 (24.1)	4 (14.8)	

The symptoms for which cough syrups were generally prescribed were fever, headache, dry and productive cough, shortness of breath, and sneezing. Brand C was mostly prescribed for productive cough (n=23; 48.9%), followed by dry cough (n=21; 44.7%). The other Brands were prescribed for both dry and productive cough (Fig 1).

Brand C was the most prescribed cough syrup (n=47; 19.6%, males: 25 [53.2%] and females: 22 [46.8%]) followed by Brand G (n=29; 12.1%, males: 14 [48.3%] & females: 15 [51.7%]) and Brand A (n=28; 11.7%, males: 19 [67.9%] & females: 9 [32.1%].

Fig 1 — Compositions of cough syrups used in the study

No significant association was observed for medical history of patients across all cough syrup groups (P=0.988). Hypertension was the most frequently reported medical history across all the cough syrup groups. None of the participants taking Brand G had any reported medical history (Table 2).

A significant association was found between the dose frequency and duration of cough syrups across all groups (P=0.005 for both). The most frequently prescribed dose and frequency across all cough syrups was 1 TSF (Table Spoon Full) twice daily, with 17 patients (60.7%) receiving this dose for Brand E, followed by 16 patients (57.1%) for Brand Aand 15 patients (55.6%) for Brand H. Brand C was most commonly prescribed as 1 TSF thrice daily. The majority of cough syrups were prescribed for 5 days in over 50% of patients (Table 3).

The study evaluated patient preferences for different aspects of cough syrups, including aftertaste, aroma, color, flavor, mouthfeel, taste, and viscosity (Table 4). Brand D received the highest number of responses for "I liked it somewhat" and "I liked it extremely" regarding the aftertaste of the syrup (n=16; 59.3%), followed by Brand B (n=14; 53.8%), Brand A (n=12; 42.9%), and Brand C (n=20; 42.6%).

For aroma, Brand A (n=19; 67.9%) had the highest responses for "I liked it somewhat" and "I liked it extremely", followed by Brand C (n=28; 59.5%), Brand D(n=16; 59.2%), and Brand B (n=14; 53.8%).

Brand C (n=19; 40.4%) received the highest number of responses for "I liked it somewhat" and "I liked it extremely" regarding the color of the syrup, followed by Brand A (n=10; 35.7%), and Brand B (n=7; 26.9%).

Brand A (n=15; 53.6%) and Brand C (n=24; 51.0%) were the cough syrups which received the highest number of responses for "I liked it somewhat" and "I liked it extremely" regarding the flavor of the syrup, followed by Brand D (n=12; 44.4%) and Brand B (n=11;

Table 2 — *Medical history of patients by cough syrup*

Cough syrups Medical History	n (%)	P value
Brand A (N=28) :		
Hypertension	3 (10.7)	0.9880
Hypothyroidism	1 (3.6)	
Diabetes Mellitus	1 (3.6)	
Brand B (N=26) :		
Hypertension	1 (3.8)	
Brand C (N=47) :		
Bronchitis	1 (2.1)	
Chronic kidney disease	1 (2.1)	
Cold and Fever	1 (2.1)	
Coronary artery disease	1 (2.1)	
Hypothyroidism	1 (2.1)	
Dyslipidemia	1 (2.1)	
Hypertension	5 (10.6)	
Type 2 diabetes mellitus	3 (6.4)	
Thyroid	1 (2.1)	
Osteopetrosis	1 (2.1)	
Vertigo	1 (2.1)	
Brand D (N=27) :		
Arthritis	1 (3.7)	
Hypertension	6 (22.2)	
Brand E (N=28) :		
Hypertension	1 (3.6)	
Diabetes	1 (3.6)	
BrandF (N=28) :		
Hypertension	4 (14.3)	
Brand H (N=27) :		
Hypertension	3 (11.1)	
Type 2 diabetes mellitus	1 (3.7)	

Table 3 — *Dose frequency and duration of cough syrups*

	Brand A (n=28)	Brand B (n=26)	Brand C (n=47)	Brand D (n=27)	Brand E (n=28)	Brand F (n=28)	Brand G (n=29)	Brand H (n=27)	P-value
Dose & Frequency, n (%)									
1 TSF twice daily	16 (57.1)	11 (42.3)	11 (23.4)	11 (40.7)	17 (60.7)	9 (32.1)	12 (41.4)	15 (55.6)	0.0052
1 TSF thrice daily	5 (17.9)	7 (26.9)	22 (46.8)	4 (14.8)	0	4 (14.3)	3 (10.3)	5 (18.5)	
2 TSF twice daily	3 (10.7)	5 (19.2)	10 (21.3)	9 (33.3)	6 (21.4)	9 (32.1)	8 (27.6)	3 (11.1)	
2 TSF thricedaily	4(14.3)	3 (11.5)	4 (8.5)	3 (11.1)	5 (17.9)	6 (21.4)	6 (20.7)	4 (14.8)	
Duration, n (%)									
5 days	14 (50.0)	15 (57.7)	34 (72.3)	23 (85.2)	15 (53.6)	20 (71.4)	18 (62.1)	18 (66.7)	0.0057
< 5 days	7 (25.0)	7 (26.9)	6 (12.8)	3 (11.1)	8 (28.6)	4 (14.3)	9 (31.0)	7 (25.9)	
> 5 days to < 10 days	7 (25.0)	4 (15.4)	7 (14.9)	1 (3.7)	2 (7.1)	4 (14.3)	2 (6.9)	2 (7.4)	
> 10 days	-	-	-	-	3 (10.7)	-	-	-	

TSF,Table spoon full.

42.3%). For remaining cough syrups, patients ranging from 32–39% had such responses.

For mouthfeel, Brand A (n=14; 50%) had the highest responses for "I liked it somewhat" and "I liked it extremely", followed by Brand C (n=22; 46.8%), and Brand D (n=12; 44.4%). Brand E (n=5; 17.8%) and Brand G (n=5; 17.2%) had least number of responses for "I liked it somewhat" and "I liked it extremely" regarding the mouthfeel of the syrup. Brand C (n=26; 55.3%), Brand A (n=13; 46.4%) and Brand D (n=11; 40.7%) cough syrups received the highest number of responses for "I liked it somewhat" and "I liked it extremely" regarding the taste of the syrup.Brand G (n=5; 17.2%) received the least number of such responses for the taste.Brand C (n=23; 48.9%), and Brand D (n=13; 48.1%) cough syrups received the highest number of responses for "I liked it somewhat" and "I liked it extremely" regarding the viscosity of the syrup.

Overall, 233 (97.1%) patients had consumed the cough syrup in the same dosage and duration as prescribed and were compliant. Patients consuming Brands C, E, F, and H reported 100% compliance to the dosage and duration as prescribed (Fig 2).

Discussion

The study is the first of its kind to assess the organoleptic features of 8 leading marketed cough syrups and compared them to understand the patients' preference. A cough syrup with good organoleptic properties can improve patient compliance, satisfaction, and overall health outcomes.

If a medication has an unpleasant taste or odor, the patient may be less likely to comply with the prescribed regimen, leading to suboptimal treatment outcomes. The aftertaste of cough syrups can be impacted by several factors, including the active ingredients, excipients, sweeteners, flavorings, and preservatives used in the formulation. Our results indicate that Brand D received the highest number of positive responses for aftertaste, followed by Brands B, A, and C. Most of these cough syrups have used mentholated flavored sugar base and menthol can improve the aftertaste of cough syrups by providing a refreshing sensation and masking unpleasant flavors, making the syrup more palatable and easier to swallow[6]. Flavored syrupy bases are often added to cough syrups to improve the aftertaste of the active ingredients. These bases typically contain sweeteners to make the syrup taste better. The addition of a syrupy base also helps to make the cough syrup thicker and more viscous, which can provide a more soothing effect on the throat[5].

Our study demonstrated the highest positive responses for aroma for Brands A and C which could be attributed to the presence of menthol as one of the excipients. Brand C received the highest positive responses for color. Brand A and C had the highest

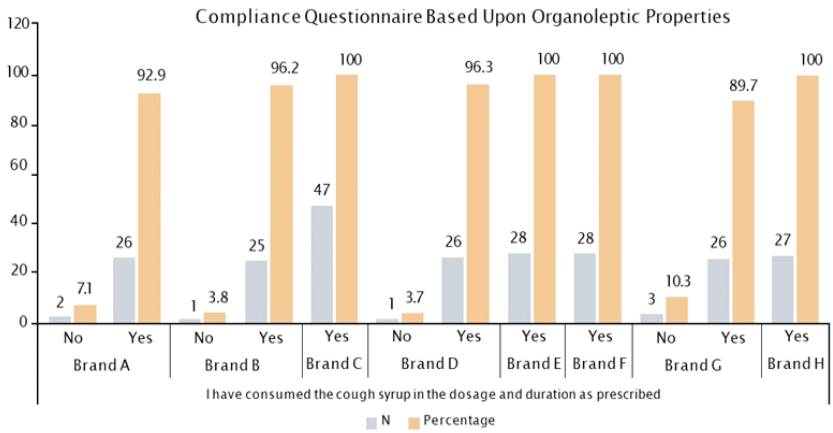

Fig 2 — Compliance Questionnaire Based on Organoleptic Properties – Overall

Table 4 — *Organoleptic properties of cough syrups*

Cough Syrup	Question	I dislike it extremely n (%)	I dislike it somewhat n (%)	Neutral n (%)	I like it somewhat n (%)	I like it extremely n (%)
Brand A(N=28)	After Taste of the syrup	0	4 (14.3)	12 (42.9)	8 (28.6)	4 (14.3)
	Aroma of the syrup	0	4 (14.3)	5 (17.9)	12 (42.9)	7 (25.0)
	Color of the syrup	2 (7.1)	2 (7.1)	14 (50.0)	9 (32.1)	1 (3.6)
	Flavour of the syrup	2 (7.1)	2 (7.1)	9 (32.1)	12 (42.9)	3 (10.7)
	Mouth feel of the syrup	0	3 (10.7)	11 (39.3)	13 (46.4)	1 (3.6)
	Taste of the syrup	0	3 (10.7)	12 (42.9)	11 (39.3)	2 (7.1)
	Viscosity of the syrup	0	4 (14.3)	17 (60.7)	7 (25.0)	0
Brand B (N=26)	After Taste of the syrup	1 (3.8)	2 (7.7)	9 (34.6)	9 (34.6)	5 (19.2)
	Aroma of the syrup	1 (3.8)	2 (7.7)	9 (34.6)	7 (26.9)	7 (26.9)
	Color of the syrup	4 (15.4)	2 (7.7)	13 (50.0)	5 (19.2)	2 (7.7)
	Flavour of the syrup	0	7 (26.9)	8 (30.8)	9 (34.6)	2 (7.7)
	Mouth feel of the syrup	0	7 (26.9)	9 (34.6)	8 (30.8)	2 (7.7)
	Taste of the syrup	2 (7.7)	4 (15.4)	10 (38.5)	8 (30.8)	2 (7.7)
	Viscosity of the syrup	0	5 (19.2)	11 (42.3)	9 (34.6)	1 (3.8)
Brand C(N=47)	After Taste of the syrup	0	8 (17.0)	19 (40.4)	13 (27.7)	7 (14.9)
	Aroma of the syrup	0	6 (12.8)	13 (27.7)	16 (34.0)	12 (25.5)
	Color of the syrup	2 (4.3)	3 (6.4)	23 (48.9)	11 (23.4)	8 (17.0)
	Flavour of the syrup	1 (2.1)	6 (12.8)	16 (34.0)	16 (34.0)	8 (17.0)
	Mouth feel of the syrup	1 (2.1)	5 (10.6)	19 (40.4)	16 (34.0)	6 (12.8)
	Taste of the syrup	1 (2.1)	5 (10.6)	15 (31.9)	22 (46.8)	4 (8.5)
	Viscosity of the syrup	1 (2.1)	4 (8.5)	19 (40.4)	19 (40.4)	4 (8.5)
Brand D (N=27)	After Taste of the syrup	0	6 (22.2)	5 (18.5)	14 (51.9)	2 (7.4)
	Aroma of the syrup	0	4 (14.8)	7 (25.9)	13 (48.1)	3 (11.1)
	Color of the syrup	4 (14.8)	3 (11.1)	16 (59.3)	2 (7.4)	2 (7.4)
	Flavour of the syrup	0	3 (11.1)	12 (44.4)	8 (29.6)	4 (14.8)
	Mouth feel of the syrup	0	6 (22.2)	9 (33.3)	9 (33.3)	3 (11.1)
	Taste of the syrup	1 (3.7)	3 (11.1)	12 (44.4)	8 (29.6)	3 (11.1)
	Viscosity of the syrup	0	2 (7.4)	12 (44.4)	11 (40.7)	2 (7.4)
Brand E(N=28)	After Taste of the syrup	6 (21.4)	7 (25.0)	7 (25.0)	5 (17.9)	3 (10.7)
	Aroma of the syrup	2 (7.1)	7 (25.0)	9 (32.1)	9 (32.1)	1 (3.6)
	Color of the syrup	4 (14.3)	3 (10.7)	14 (50.0)	6 (21.4)	1 (3.6)
	Flavour of the syrup	1 (3.6)	4 (14.3)	12 (42.9)	10 (35.7)	1 (3.6)
	Mouth feel of the syrup	2 (7.1)	8 (28.6)	13 (46.4)	3 (10.7)	2 (7.1)
	Taste of the syrup	1 (3.6)	8 (28.6)	10 (35.7)	9 (32.1)	0
	Viscosity of the syrup	0	9 (32.1)	13 (46.4)	4 (14.3)	2 (7.1)
BrandF (N=28)	After Taste of the syrup	0	9 (32.1)	6 (21.4)	9 (32.1)	4 (14.3)
	Aroma of the syrup	1 (3.6)	1 (3.6)	13 (46.4)	11 (39.3)	2 (7.1)
	Color of the syrup	5 (17.9)	3 (10.7)	13 (46.4)	2 (7.1)	4 (14.3)
	Flavour of the syrup	2 (7.1)	5 (17.9)	12 (42.9)	6 (21.4)	3 (10.7)
	Mouth feel of the syrup	0	5 (17.9)	12 (42.9)	10 (35.7)	1 (3.6)
	Taste of the syrup	3 (10.7)	3 (10.7)	13 (46.4)	8 (28.6)	0
	Viscosity of the syrup	0	11 (39.3)	9 (32.1)	8 (28.6)	0
Brand G(N=29)	After Taste of the syrup	4 (13.8)	8 (27.6)	8 (27.6)	6 (20.7)	3 (10.3)
	Aroma of the syrup	1 (3.4)	2 (6.9)	16 (55.2)	5 (17.2)	5 (17.2)
	Color of the syrup	6 (20.7)	2 (6.9)	14 (48.3)	5 (17.2)	2 (6.9)
	Flavour of the syrup	3 (10.3)	1 (3.4)	14 (48.3)	11 (37.9)	0
	Mouth feel of the syrup	2 (6.9)	8 (27.6)	14 (48.3)	4 (13.8)	1 (3.4)
	Taste of the syrup	2 (6.9)	10 (34.5)	12 (41.4)	5 (17.2)	0
	Viscosity of the syrup	1 (3.4)	9 (31.0)	14 (48.3)	5 (17.2)	0
Brand H(N=27)	After Taste of the syrup	4 (14.8)	6 (22.2)	9 (33.3)	7 (25.9)	1 (3.7)
	Aroma of the syrup	2 (7.4)	8 (29.6)	8 (29.6)	6 (22.2)	3 (11.1)
	Color of the syrup	5 (18.5)	2 (7.4)	14 (51.9)	4 (14.8)	2 (7.4)
	Flavour of the syrup	0	6 (22.2)	10 (37.0)	7 (25.9)	3 (11.1)
	Mouth feel of the syrup	1 (3.7)	4 (14.8)	12 (44.4)	9 (33.3)	1 (3.7)
	Taste of the syrup	1 (3.7)	7 (25.9)	11 (40.7)	7 (25.9)	1 (3.7)
	Viscosity of the syrup	2 (7.4)	6 (22.2)	11 (40.7)	7 (25.9)	1 (3.7)

positive responses for flavor, and Brand A had the highest positive responses for mouthfeel. Brand C and D had the highest positive responses for taste and viscosity.

Menthol is a commonly used ingredient in cough syrups because it provides a cooling and soothing sensation in the throat and nasal passages. When combined with a flavored syrup base, it can improve the taste and odor of the cough syrup, making it more palatable for patients. In addition to menthol, some cough syrups, such as Brand C, contain Carmoisine. Carmoisine is a food coloring that is added to improve the color and appearance of the cough syrup. This can have a positive impact on patients, as colors are known to evoke emotions and feelings. For example, warm colors such as red and orange can evoke feelings of warmth and comfort, which may help patients feel more at ease when taking the cough syrup.[7]

The study found that a high percentage of patients, 97.1%, were adhering to the recommended dosage and duration of the cough syrup. This is a positive finding because it suggests that these patients are following the instructions provided by their healthcare provider, and are taking the cough syrup as intended. It's worth noting that the study also found that the cough syrup had unsatisfactory organoleptic properties and despite this, the patients still adhered to the prescribed regimen. This indicates that the patients may be placing more importance on the effectiveness outcomes of the cough syrup rather than its sensory properties. Overall, the study suggests that patients are willing to follow the prescribed regimen for cough syrup, even if they find it unpleasant to take. This is an important finding for healthcare providers, as it highlights the importance of providing effective treatments that patients are willing to adhere to, even if they are not always palatable.

Our study had several limitations. Firstly, the study was observational in nature, which means that we did not control for other confounding factors that could have influenced the subject's response. This limits the ability to establish a cause-and-effect relationship between the variables. It is important to acknowledge that subjective responses are subject to individual interpretation and may be influenced by various factors, such as personal beliefs and expectations. Lastly, the study sample was limited to patients from only two cities, which may affect the generalizability of the findings to other populations. Differences in demographics, cultural background, and healthcare practices between different regions can influence patient behavior.While the study provides valuable insights into patient adherence to cough syrup regimens, further research is necessary to validate these findings.

Conclusion

In our study, we observed that Dr Reddy's laboratories marketed syrups (Brands A, B, C and D) were the most accepted and liked cough syrups among the studied population as compared to other 4 leading marketed cough syrup brands. Overall, a high percentage of patients (ie, 97.1%) adhered to the recommended dosage and duration of the cough syrup, indicating that patients may prioritize the effectiveness outcomes of the cough syrup over its sensory properties.

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