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Original Research Article

Knowledge, attitude, and behaviour of patients and pharmacists towards cough and its treatment: a questionnaire-based Pan-India survey

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ABSTRACT

Background: Cough is one of the most common symptoms for which medical treatment is sought in the outpatient setting. An increased awareness of treatment patterns for the management of cough among pharmacists and patients is essential for its effective management and improving patients' quality of life. Considering the paucity of data from India, present survey was conducted to assess the knowledge, attitude, and behaviour (KAB) regarding cough management among patients and pharmacists in Indian setting.
Methods: Patients and pharmacists (≥18 years) were provided with a questionnaire-based survey with domains namely knowledge (patients: 11; pharmacists: 10 questions), attitude (patients: 7; pharmacists: 9 questions), and behaviour and experience (patients: 15; pharmacists: 13 questions).
Results: 1000 patients (men: 75%; mean age: 33.85±10.77 years) and 50 pharmacists (men: 100%; mean age: 38.36±10.64 years) completed the survey. The mean knowledge domain scores were moderate for patients (5.66±2.94) and low for pharmacists (3.34 ±2.95). About 31% patients and 72% pharmacists had low knowledge level. The mean attitude domain scores were also low among both the groups (patients: 4.81±3.34; pharmacists: 5.10±4.16). Majority of patients (96%) purchased cough medicines multiple times in a year; ~60% purchased without consulting a physician. Most patients purchased medicines without a prescription (94%) or using an old prescription (88%); but only 12% patients received advice on dosing from the pharmacist. OTC medicines were dispensed to paediatric (up to 30%) and elderly patients (up to 16%) as well.
Conclusions: Knowledge and attitude regarding cough and its management is not adequate among patients and pharmacists, which in turn had a negative impact on their behaviour. This study emphasizes the need for awareness programs and healthcare policies for the effective management of cough.

Keywords: Cough, Knowledge, Attitude, Behaviour, Survey

INTRODUCTION

Cough is a natural reflex to expel irritants or infectious agents from the upper respiratory tract. It is one of the most common presentations seen in about 30% of patients in general practice.[1] Transient illness resulting from acute cough is usually self-limiting and resolves within 2 weeks. However, studies have shown that acute cough adversely affects daily activities and productivity at work, with significant impact on the public health resources of the country.[2] Chronic cough, on the other hand, lasts for >8 weeks and has been shown to be associated with considerable morbidity, which has both physical and psychological consequences.[3,4]

The standard treatment guidelines recommend managing cough based on its duration and etiology.[5,6] Pharmacological treatment options include antitussives, mucolytics/expectorants, antihistamines, decongestants, bronchodilators, or their combinations. However, patients use many of these drugs and practise self-medication for cough.[7] There is a paucity of studies that evaluate patients' understanding about the appropriate use, efficacy and safety of cough medicines. Inappropriate or irrational use of these cough medications may lead to severe adverse effects.[8] Data has also shown that the knowledge among pharmacists about evidence-based medicine and regulations are inadequate.[9,10] Given this scenario and the concurrent drive for self-care, sensitization of pharmacists and patients is essential for appropriate management of cough. This indicates the need to understand the gaps in knowledge, attitude, and behaviour (KAB) with regard to cough management amongst patients and pharmacists.

In the present study, by means of a questionnaire-based survey, we aimed to assess the KAB among patients (or caregivers) and pharmacists in India. Additionally, we also assessed the experiences of pharmacists with regard to cough management practices among patients.

METHODS

Study design and participants

This cross-sectional, questionnaire-based, pan-India survey was conducted across 50 retail pharmacies, between July and August 2018. Pharmacies were selected from all the five different regions: North (Delhi, Chandigarh, Lucknow, and Allahabad), South (Chennai, Bengaluru, Kochi, and Visakhapatnam), East (Kolkata, Guwahati, Patna, and Ranchi), West (Mumbai, Pune, Ahemadabad, and Jaipur), and Central (Bhopal, Indore, Hyderabad, and Nagpur).

Patients or caregivers (aged ≥18 years) visiting the selected pharmacies for purchasing cough medication(s) with or without a prescription and certified pharmacists involved in dispensing both allopathic and conventional medicines for cough, and willing to sign the participation authorization form (PAF), were enrolled in this survey. Data were collected during a face-to-face interview using a self-administered questionnaire.

The study was conducted in accordance with the Declaration of Helsinki, International Conference on Harmonisation-Good Clinical Practice (ICH-GCP) guidelines, Indian Council of Medical Research (ICMR), and Indian GCP guidelines. The study protocol, survey questionnaires, and PAF were approved by an independent ethics committee.

Questionnaire

Patients and pharmacists were provided with two separate questionnaires with domains namely knowledge (patients: 11; pharmacists: 9 questions), attitude (patients: 7; pharmacists: 9 questions), and behaviour (patients: 15; pharmacists: 6 questions) (Appendix 1). In addition, the pharmacists' questionnaire contained 7 questions to assess their perception/experience regarding patients' behaviour. The questionnaires were developed based on literature review and reviewed by a 5-member independent expert panel group. The expert group comprised of a senior key opinion leader, a pharmacologist, a certified pharmacist (with ≥10 years of experience), a pharmacovigilance expert, and a social worker.

Scoring

For the purpose of scoring of knowledge domain questions, 1 point was given for each correct response, -1 for an incorrect response, and 0 for a response of 'don't know'. In the attitude domain, responses to positive statements were scored as follows: 2 points for strongly agree, 1 for agree, 0 for neutral, -1 for disagree, and -2 for strongly disagree. Scoring system was reverse for negative questions. Responses to questions in the behaviour and experience domains were not scored.

Study endpoints

The primary endpoints were overall knowledge and attitude domain scores of participants, and proportion of participants in different behaviour categories. The other endpoints included proportions of participants in different knowledge level categories (high: score >7; moderate: score5 to 7; low: score ≤4), those with positive attitude (pharmacists: score >9; patients: >7), and those with correct responses to each of the statements in knowledge and attitude domains. The secondary endpoints included sub-group analyses by age, gender, geographical region, and socio-economic categories among patients, and by geographical region, educational qualification, and monthly income among pharmacists.

Statistical analysis

No sample size calculations were done for this survey. Continuous and quantitative variables were summarized using descriptive statistics. Categorical data were presented as frequency count (n) and percentages (%). All statistical analyses were performed using Statistical Package for the Social Sciences version 23.0.

RESULTS

Overall, 1000 patients (men: 749 [74.9%]; mean [SD] age: 33.85 [10.77] years) and 50 pharmacists (men: 50 [100%]; mean [SD] age 38.36 [10.64] years) completed the survey. About 46.1% patients belonged to the upper-middle class (mean Kuppuswamy classification score, 16.40±5.20). The percentages of patients and pharmacists were similar across each of the 5 geographical zones (Table 1).

Table 1: Demographic characteristics of survey participants.

Characteristic	Patients (n=1000)	Pharmacists (n=50)
Men N (%)	749 (74.9)	50 (100)
Age, mean±SD (years)	33.85±10.77	38.36±10.64
Region,	**N (%)**	**N (%)**
North	199 (19.9)	11 (22)
South	200 (20)	8 (16)
East	201 (20.1)	10 (20)
West	200 (20)	11 (22)
Central	200 (20)	10 (20)

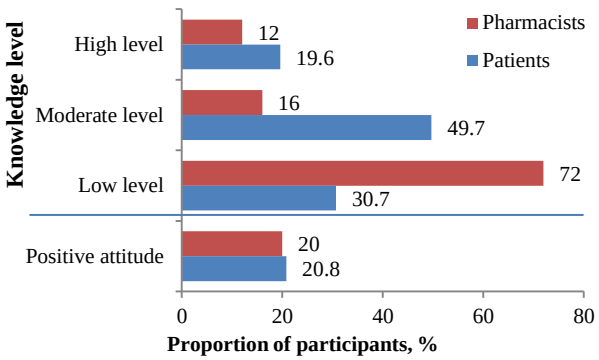


Figure 1: Awareness level of study participants with respect to knowledge and attitude.

Table 2: Summary of correct responses to questions in knowledge domain (n=1000).

Survey statement	Correct response	N (%)
Patients (n=1000)		
Dry cough indicates possibility of upper respiratory tract infection	T	941 (94.1)
Season change may cause cough	T	915 (91.5)
Respiratory illness/breathing-related ailments (such as asthma, chronic bronchitis) can cause cough	T	846 (84.6)
Smoking or pollution may cause cough	T	838 (83.8)
Cough medicines are harmless/do not have side effects	F	230 (23)
Cough can be of two types: wet cough (with sputum) and dry cough (without sputum)	T	866 (86.6)
Long-standing cough indicates possibility of a major illness	T	844 (84.4)
Physician should be consulted for cough with sputum/blood and breathlessness	T	816 (81.6)
Physician should be consulted for long-standing cough of more than 3 weeks	T	798 (79.8)
One can get medicine from pharmacy if cough is not accompanied by any other symptom	F	145 (14.5)
There are legislations/regulations for OTC sale of medicines	T	616 (61.6)
Pharmacists (n=50)		
Upper respiratory tract infection can give rise to cough	T	46 (92)
Allergy may cause long-standing dry cough	T	44 (88)
Physician's intervention is required if wheezing accompanies acute cough	T	43 (86)
Antibiotics should be given only if cough is related to an infectious cause	T	43 (86)
Allergic cough can be treated with over-the-counter (OTC) medicines	F	25 (50)
All antitussives are Schedule H drugs	F	19 (38)
Treatment of cough with OTC medicines for longer duration can cause serious side effects	T	34 (68)
Expectorants (guaifenesin, etc.) and cough suppressants (dextromethorphan) do not give rise to serious side effects	T	28 (56)
Drowsiness in patients always indicates overdose of cough medication	F	12 (24)

T-true; F-false.

Knowledge domain

The mean knowledge domain scores were moderate for patients (5.66±2.94) and low for pharmacists (3.34 ±2.95), which indicates a lack of knowledge regarding cough among both groups. Overall, 30.7% patients and 72% pharmacists had low knowledge level; only 19.6% patients and 12% pharmacists had high knowledge level regarding cough and its management (Figure 1).

Majority (84%–94%) of patients were aware of the different types and causes of cough. About 80% of patients had knowledge regarding the need for physician consultation for long-standing cough and cough with sputum/blood and breathlessness (Table 2). However, only 23% of patients were aware that cough medicines do have side effects and 14% recognised that it is not appropriate to purchase medicine from a pharmacy without consulting a physician. The proportion of patients who were unaware of the regulation/legislation for sale of over-the-counter (OTC) drugs was 38%.

Table 3: Summary of patients' knowledge and attitude scores by demographic and socio-economic characteristics.

		Knowledge Score				Attitude score	
	N	Mean±SD	High (Score >7)	Moderate (Score 5–7)	Low (Score ≤4)	Mean±SD	Positive attitude (Score >7)
Overall	1000	5.66±2.94	196 (19.6)	497 (49.7)	307 (30.7)	4.81±3.34	208 (20.8)
Age							
18–50 years	917 (91.7)	5.63±2.96	170 (18.5)	462 (50.4)	285 (31.1)	4.76±3.32	188 (20.5)
>50 years	83 (8.3)	6.08±2.77	26 (31.3)	35 (42.2)	22 (26.5)	5.25±3.55	20 (24.1)
Gender							
Male	749 (74.9)	5.51±2.72	119 (15.9)	396 (52.9)	234 (31.2)	4.50±3.09	132 (17.6)
Female	251 (25.1)	6.13±3.49	77 (30.7)	101 (40.2)	73 (29.1)	5.73±3.86	76 (30.3)
Region							
North	199 (19.9)	5.66±2.40	43 (21.6)	98 (49.2)	58 (29.1)	3.53±2.64	15 (7.5)
South	200 (20)	6.72±3.87	79 (39.5)	66 (33.0)	55 (27.5)	8.26±3.93	122 (61.0)
East	201 (20.1)	4.84±2.69	37 (18.4)	74 (36.8)	90 (44.8)	3.49±2.43	16 (8.0)
West	200 (20)	5.70±2.38	17 (8.5)	138 (69.0)	45 (22.5)	4.25±2.54	29 (14.5)
Central	200 (20)	5.41±2.83	20 (10)	121 (60.5)	59 (29.5)	4.51±2.37	26 (13.0)
Socio-economic status (Score)[a]							
Lower class (<5)	1 (0.1)	-	-	-	1 (100)	-	1 (100)
Upper-lower class (5–10)	119 (11.9)	4.97±3.06	26 (21.8)	38 (31.9)	55 (46.2)	4.33±3.21	24 (20.2)
Lower-middle class (10–15)	355 (35.5)	5.12±3.06	59 (16.6)	163 (45.9)	133 (37.5)	4.65±2.98	61 (17.2)
Upper-middle class (16–25)	461 (46.1)	6.16±2.79	97 (21.0)	257 (55.7)	107 (23.2)	5.08±3.62	110 (23.9)
Upper class (26–29)	64 (6.4)	6.40±2.34	14 (21.9)	39 (60.9)	11 (17.2)	4.51±3.35	12 (18.8)

[a]Data collected according to the updated Kuppuswamy classification and socio-economic status scales (2017)[1,16].

Table 4: Summary of patients' responses to behaviour domain questions.

Variable		Response	N	%
Q1	On an average, how often do you buy medicines for cough?	More than once a month	107	10.7
		Once a month	368	36.8
		Many times in a year	481	48.1
		Other	44	4.4
Q2	What dosage form do you generally buy for cough?	Tablet	209	20.9
		Lozenge	34	3.4
		Syrup	755	75.5
		Other	2	.2
Q3	What brand of cough medicine do you buy?	No specific preference	424	42.4
		Data not shown		
Q4	How often do you buy cough medicines without a prescription?	100% of the time	46	4.6
		50-75% of the time	399	39.9
		25-50% of the time	364	36.4
		<25% of the time	129	12.9
		Never	62	6.2
Q5	How often do you buy cough medicines according to an old prescription?	100% of the time	46	4.6
		50-75% of the time	271	27.1
		25-50% of the time	374	37.4
		<25% of the time	186	18.6
		Never	123	12.3
Q6	How often do you buy a medicine that is the same brand as your existing cough medicine?	100% of the time	82	8.2
		50-75% of the time	315	31.5
		25-50% of the time	338	33.8
		<25% of the time	203	20.3
		Never	62	6.2

Continued.

Variable		Response	N	%
Q7	How often do you visit a physician if the symptoms are not cured by an OTC cough medicine?	100% of the time	206	20.6
		50-75% of the time	343	34.3
		25-50% of the time	281	28.1
		<25% of the time	152	15.2
		Never	18	1.8
Q8	Do you buy Ayurveda medicine for cough	Yes	302	30.2
		No	698	69.8
Q9	Is price a factor for selecting a cough medicine?	Yes	445	44.5
		No	555	55.5
Q10	Do you read the label or package insert (medicine information) before buying a cough medicine?	Yes	814	81.4
		No	186	18.6
Q11	Do you use online pharmacy portals for buying cough medicines?	Yes	140	14.0
		No	860	86.0
Q12	Do you inform doctor or pharmacist if you or your relatives get drowsiness/sleepiness after taking a cough medication?	Yes	719	71.9
		No	281	28.1
Q13	When you buy cough medicine from a pharmacy, how often he/she advises you about the dose to be taken?	100% of the time	120	12.0
		50-75% of the time	454	45.4
		25-50% of the time	275	27.5
		<25% of the time	102	10.2
		Never	49	4.9
Q14	When you buy a cough medicine from a pharmacy, how often he/she informs you about the precautions/side effects?	100% of the time	81	8.1
		50-75% of the time	258	25.8
		25-50% of the time	246	24.6
		<25% of the time	241	24.1
		Never	174	17.4
Q15	Have you consulted a physician for yourself or your relatives at a clinic or hospital for the current cough symptoms?	Yes, currently taking treatment under the care of a physician	402	40.2
		No, not yet consulted	381	38.1
		No, but intent to consult a physician in case of no relief by an OTC medicine	217	21.7

Among pharmacists, there was high awareness (86%–92%) regarding the causes of cough and the need for physician intervention for patients with wheezing. Most pharmacists were aware that long-term use of OTC medicines could have serious side effects (68%). However, only 50% of pharmacists were aware that allergic cough cannot be treated with OTC medicines. Furthermore, the knowledge that all antitussive drugs are not Schedule H drugs was limited to only 38% pharmacists (Table 2).

Sub-group analyses revealed that among patients, mean knowledge domain scores were higher in older age group (>50 years) and women (Table 3). In the pharmacists group, mean knowledge domain scores were highest in the southern region, those with a graduate degree, and with 1-5 years' experience (Table 4).

Attitude domain

Overall, participants lacked desirable attitude towards cough management as indicated by the low attitude domain scores (patients: 4.81±3.34; pharmacists: 5.10±4.16). Only a small percentage (~20%) of participants had a positive attitude towards cough management (Figure 1).

Majority of the patients were aware that a physician should be consulted before taking medications (87.1%), particularly in case of children, pregnant or lactating women, or elderly and when cough is accompanied by high-grade fever (~90%) (Table 3). About one-third of patients knew that medicines should not be purchased using old prescriptions. Over 60% of patients were in agreement that OTC cough medicines help consumers stay productive and that these are convenient and cost-effective; only 20.8% knew that OTC medications can be used for minor ailments.

Most pharmacists (84%) agreed that patients purchase OTC cough medications due to accessibility and quick symptomatic relief without additional consultation cost. However, only a small percentage (30%-42%) of pharmacists were aware that patients should be referred to a physician if they have chronic cough, if cough worsens with OTC medication, or if patient is a pregnant or lactating mother. Majority (76%) of pharmacists knew that asthma should not be treated with OTC medicines;

84% agreed that training on safety measures is a prerequisite for selling OTC drugs. It was evident that although 10 (20%) pharmacists had an optimistic attitude (mean score >9), only 6 (12%) pharmacists showed a desirable attitude (total attitude domain score 18) towards cough medication (Table 5).

Table 5: Summary of correct responses to questions in attitude domain.

Survey statement	Correct responses	N (%)
Patients (n=1000)		
One should always consult a physician before taking any medication	A/SA	871 (87.1)
One should not buy OTC medicines for minor ailments	D/SD	208 (20.8)
One should buy medicines using old prescriptions for similar ailments	D/SD	348 (34.8)
One should consult a physician if a child/pregnant woman/breastfeeding woman/elderly person is suffering from cough	A/SA	892 (89.2)
One should consult a physician if cough is accompanied by high-grade fever	A/SA	881 (88.1)
OTC cough medicines allow consumers to stay productive at work and at school when they do not feel well	A/SA	669 (66.9)
OTC cough medicines are convenient and cost-effective	A/SA	637 (63.7)
Pharmacists (n=50)		
Patients buy OTC medicines for cough due to easier access and symptomatic relief without spending time and physician fees	A/SA	32 (64)
Chronic cough can be treated with OTC medicines	D/SD	20 (40)
Physician intervention is often necessary for the effective management of cough.	A/SA	44 (88)
If an OTC cough medication causes worsening of symptoms, the pharmacist can dispense another class of drug.	D/SD	19 (38)
Patient should be referred to a physician if he/she gets side effect(s) due to the cough medication	A/SA	43 (86)
Patients with asthma should not be treated with OTC medicines	A/SA	38 (76)
Cough medication can be dispensed to pregnant and lactating ladies without physician's prescription	D/SD	21(42)
Pharmacists need training about the precautions to be taken while selling OTC drugs	A/SA	42 (84)
Previous prescriptions can be used to dispense cough medication in case of recurrent symptoms.	D/SD	17(34)

A/SA, agree or strongly agree; D/SD, disagree or strongly disagree.

Mean attitude domain scores were higher in the older sub-group of patients, women, participants from southern zone, and upper-middle class (Table 4). Furthermore, the southern zone had the greatest proportion (61%) of patients with a positive attitude. Among pharmacists, sub-groups associated with higher attitude domain total scores were from southern region and experience >20 years (Table 4).

Behaviour and experience domains

Forty-two percent of patients did not have a preference for any particular brand of medication. A majority of patients often purchased medicines without prescription (93.8%) or using an old prescription (87.7%) (Figure 2A). Approximately 60% of patients were purchasing cough medication without consulting a physician (Figure 2B). About 79.4% of patients often did not visit a physician even if their symptoms were not cured by OTC medication (Figure 2C). A majority of patients (95.6%) purchased cough medicines multiple times in a year; 75.5% of patients preferred syrups while 24.3% preferred tablets (Table 6). About 70% of patients did not prefer alternate medications for cough. Further, 14% of patients had used online portals for buying cough medications. A majority (71.9%) of patients said that they reported drowsiness/sleepiness caused by a cough medication. Approximately 88% patients reported that they often did not receive advice on dosing from the pharmacist.

The most common class of OTC medicine dispensed for dry cough was cough suppressant (74%), expectorant (26%), and lozenges (20%). Similarly, for cough associated with sputum, cough suppressants were the most common OTC drugs (54%), followed by expectorants (34%), and lozenges (20%) (Figure 3A). In order to confirm the accuracy of the class of drug dispensed, we compared the generic names and corresponding brand names provided by pharmacists. In few instances, dispensing errors had occurred with antihistamines (22.2%) and expectorants (7.6%) as well. Further, it was also found that OTC medicines were dispensed by pharmacists to paediatric (up to 30%) and elderly (16%) patients as well (Table 7). Many pharmacists dispensed either a different brand (46%) or a substitute (62%) instead of the prescribed medication; 36% of pharmacists often dispense Ayurveda medicines (Figure 3B).

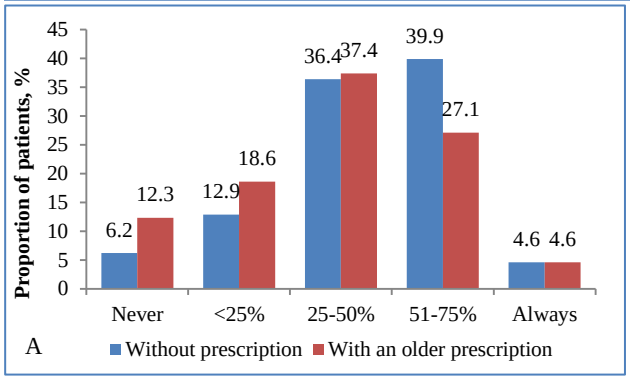
Table 6: Summary of pharmacists' knowledge and attitude scores by region and socio-economic characteristics.

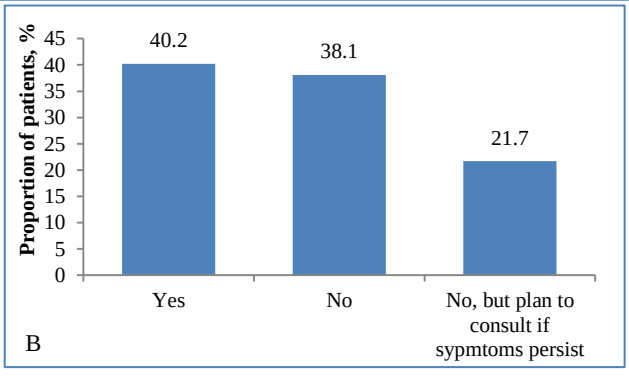
	Knowledge Score					Attitude score	
	N	Mean±SD	High (Score >7)	Moderate (Score 5–7)	Low (Score ≤4)	Mean±SD	Positive attitude (Score >7)
Overall	50	3.34 ±2.95	6 (12)	8 (16)	36 (72)	5.10±4.16	10 (20)
Region							
North	11 (22)	4.09±2.43	2 (18.2)	-	9 (81.8)	4.45±3.98	2 (18.2)
South	8 (16)	6.75±2.66	2 (25)	2 (25)	4 (50)	8.63±3.81	4 (50)
East	10 (20)	1.60±3.44	-	3 (30)-	7 (70)	5.30±4.14	1 (10)
West	11 (22)	2.55±1.37	1 (9.7)-	3 (27.3)-	7 (63.3)	3.64±3.23	1 (10)
Central	10 (20)	2.40±2.27	-	1 (10)	9 (90)	4.40±4.65	2 (20)
Educational qualification							
Diploma	19 (38)	3.05±2.97	2 (10.5)	2 (10.5)	15 (78.9)	5.00±4.73	5 (26.3)
Graduation	23 (46)	3.78±2.66	3 (13.0)	5 (21.7)	15 (65.2)	5.74±3.90	5 (21.7)
Post-graduation	8 (16)	2.75±3.81	1 (12.5)	2 (25.0)	5 (62.5)	3.50±3.38	0
Monthly income (in INR)							
<25,000	12 (24)	2.67±2.02	-	2 (16.7)	10 (83.3)	5.08±4.12	2 (16.7)
25,000–50,000	14 (28)	4.36±2.95	3 (21.4)	3 (21.4)	8 (57.1)	5.79±4.85	5 (35.7)
50,000–75,000	09 (18)	4.67±1.80	1 (11.1)	3 (33.3)	5 (55.6)	4.22±3.60	1 (11.1)
75,000–1,00,000	08 (16)	2.63±3.46	1 (12.5)	1 (12.5)	6 (75.0)	5.00±4.63	2 (25.0)
1,00,000–1,50,000	03 (6)	4.33±3.21	1 (33.3)	-	2 (66.7)	4.67±4.04	0
>1,50,000	03 (6)	1.67±3.06	0	0	0	4.67±4.93	0
Years of experience							
<1 year	02 (4)	3.00±2.83	-	-	2 (100%)	1.50±0.71	0
1 to <5 years	07 (14)	3.86±2.73	1 (14.3)	2 (28.6)	4 (57.1)	6.14±4.49	2 (28.6)
5 to <10 years	09 (18)	3.78±3.96	1 (11.1)	4 (44.4)	4 (44.4)	5.11±2.57	0
10 to <20 years	20 (40)	3.00±2.75	2 (10.0)	3 (15.0)	15 (75.0)	4.30±4.92	5 (25.0)
>20 years	12 (24)	3.33±2.96	2 (16.7)	-	10 (83.3)	6.42±3.63	3 (25.0)

Table 7: Summary pharmacists' responses to behaviour and experience domain questions.

Variable		Response	N	%
Behaviour				
Q1	What do you generally dispense as OTC medicine when a patient comes with dry cough?	Cough suppressant	37	74
		Expectorant	13	26.0
		Lozenges/soothing agents	10	20.0
		Antihistamines	9	18.0
		Decongestants	4	8.0
		Others	4	8.0
		None of Above	1	2.0
Q2	What do you generally dispense as OTC medicine when a patient comes to you with cough associated with sputum?	Cough suppressant	27	54
		Expectorant	17	34.0
		Lozenges/soothing agents	10	20.0
		Antihistamines	8	16.0
		Decongestants	1	2.0
		Others	1	2.0
		None of Above	-	-
Q3	To which all age groups do you dispense OTC medicines?	<1 year	6	12.0
		1-5 years	7	14.0
		>5-10 years	15	30.0
		>10-18 years	13	26.0
		>18-40 years	34	68.0
		>40-60 years	16	32.0
		>60-80 years	8	16.0
		>80 years	3	6.0

Variable		Response	N	%
Q4	How often do you dispense a different brand of medication from the brand prescribed by the physician?	Never	27	54.0
		Often	16	32.0
		Always	7	14.0
Q5	How often do you substitute the brand for some other brand?	Never	19	38.0
		<25%	20	40.0
		25-50%	8	16.0
		51-75%	2	4.0
		>75%	1	2.0
Q6	How often do you dispense Ayurveda medicine for cough	Never	14	28.0
		<25%	18	36.0
		25-50%	11	22.0
		51-75%	7	14.0
		>75%	-	-
Experience				
Q1	What dosage form is generally preferred by the patients?	Tablet	9	18.0
		Lozenge	2	4.0
		Syrup	37	74.0
		Other	2	4.0
Q2	What brand of cough medicine do you prefer to dispense	Data not shown		
Q3	On an average, how many patients buy medication for cough from your pharmacy in a particular month?	≤100	25	25
		100-500	15	15
		≥500	10	10
Q4	Out of the consumers buying medicines for cough, what percentage of patients buy it with a prescription?	None	-	-
		<25%	12	24.0
		25-50%	13	26.0
		51-75%	17	34.0
		>75%	7	14.0
		All	1	2.0
Q5	How often the consumers consider price of the medicine before buying it?	Never	11	22.0
		<25%	15	30.0
		25-50%	12	24.0
		51-75%	8	16.0
		>75%	4	8.0
Q6	How often do the patients ask you to substitute the prescribed brand?	Never	14	28.0
		<25%	21	42.0
		25-50%	10	20.0
		51-75%	4	8.0
		>75%	1	2.0
Q7	How often do the patients inform you of side effects or worsening of the cough?	Never	9	18.0
		<25%	18	36.0
		25-50%	15	30.0
		51-75%	7	14.0
		>75%	1	2.0





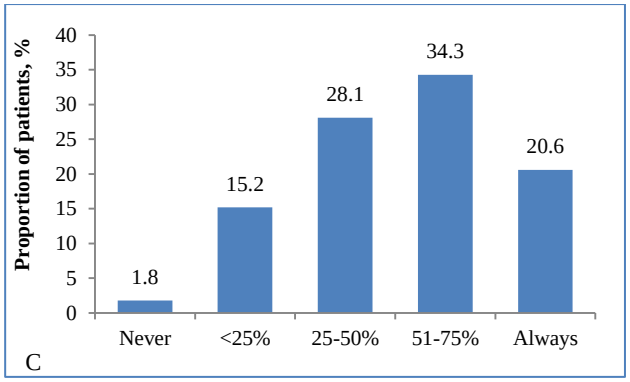
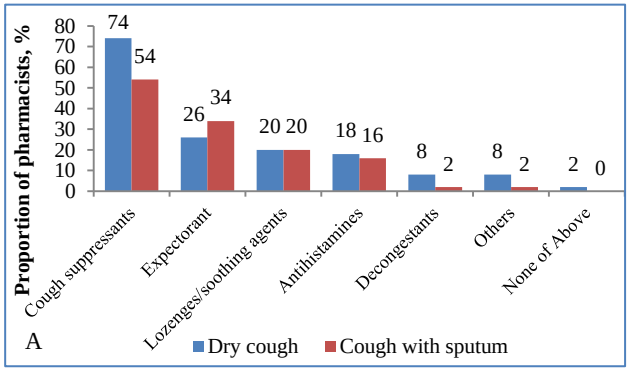


Figure 2: Patients' responses to key behaviour domain questions; (A) How often do you purchase medication without or with an older prescription; (B) how often do you visit a physician if symptoms persist; (C) have you consulted a physician for the current medication.



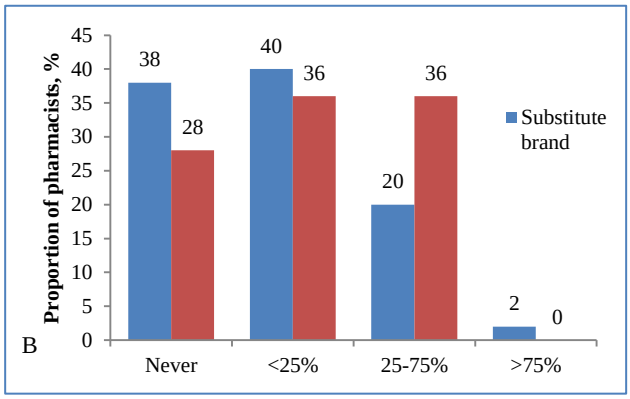


Figure 3: Pharmacists' responses to key behaviour domain questions: (A) What do you generally dispense as OTC for cough; (B) how often do you dispense a substitute brand or Ayurvedic medicine; (C) what percentage of patients buy cough medication with a prescription.

Based on the experience, 50% pharmacists reported that >100 patients purchased cough medication every month; out of which only up to 50% did so with a prescription. About 74% of pharmacists said that patients generally preferred syrups. Nearly 80% of pharmacists said that patients reported side effects or worsening of cough.

DISCUSSION

To the best of our knowledge this study is the first of its kind KAB study on cough among patients and pharmacists in India. Overall, only a small proportion of participants (<20%) had high level of knowledge regarding cough. Further, majority (~80%) of participants lack a positive attitude towards cough management. Thus, the data indicate a considerable gap in KAB among the large majority of participants.

Analysis of correct responses to knowledge questions revealed that a majority of patients and pharmacists responded correctly to questions pertaining to different causes and types of cough, and the need for physician consultation. However, the frequency of patients responding correctly to questions regarding treatment was relatively low; i.e., only 14% were in agreement that self-medication is not appropriate, 23% were aware of the side effects with cough medicines, and 34.8% were not cognizant to the fact that medicines should not be purchased using old prescriptions. Awareness of best practices for cough management was low among pharmacists as well. Compared to 62% patients, only 38% pharmacists were aware of the relevant regulations on sale of OTC medications. Another cross-sectional study conducted in Bengaluru, south India, also showed that most pharmacists were unaware of current regulations.[11] Several studies have recognized the need for pharmacists' education in achieving safe and effective medicine use.[11-14] In our study, over 60% of patients and 64% pharmacists believed that OTC cough medicines are convenient and cost-effective. Thus, this study shed light on the lack of relevance given to drug dispensing regulations among pharmacists as well as the low level of awareness amongst patients in India. Further, the results underscore the necessity to spread awareness, through education programs, for the effective management of cough.

Behavioural patterns observed among patients suggested that patients prefer syrup formulations and allopathic cough medications for faster relief; pharmacists' experiences about patients' behaviour corroborates with this observation. However, there was a discrepancy between patients' attitude and behaviour. About 87.1% of patients believed that physician should be consulted before taking any medicine but only 6-12% did so before purchasing cough medications. Moreover, our results show that more than half of the patients purchased medicines frequently; only 12% received instruction on dosing from the pharmacist. Hence, a majority of the patients may not receive optimal dose or may be at a risk of side effects arising from overdose. Pharmacists should be encouraged to counsel patients regarding dosing and side-effects and advise consumers to seek medical consultations when appropriate. Further, it was also noted that pharmacists often dispensed OTC cough medications, including to paediatric and elderly patients. Hence, pharmacists should be encouraged to practice safe

dispensing of drug and guide patients or their caregivers about dosing correctly. In line with our study, a recently concluded systematic review had reported gaps in pharmacists' behaviour patterns such as inadequate referral of patients who required medical consultation, sale of prescription drugs without prescription, sale of irrational medicines, and limited information sharing, in low-and middle-income countries such as India.[15] Our study thus accentuates the need for future efforts, not only on education programs, but also on strengthening the regulatory framework in the country.

Subgroup analyses revealed that both patients and pharmacists from the southern region possess greater knowledge and positive attitude towards cough management. This could be attributed to the higher literacy rates in this region compared with other regions of India. Other factors likely to be associated with greater awareness were female sex and higher socio-economic status among patients. These observations are in line with a systematic analysis which demonstrated that both contextual factors (education level, economic well-being of the community) and health-care system-related factors (regulation on sale of medicines) predict self-medication behaviour among patients.[17]

This study had a few limitations. Although a considerably large number of patients from different zones across India were surveyed, this may not be representative of all sections of the population (e.g., rural or sub-urban and lower class). Further, the differences in knowledge and awareness among subgroups should be interpreted cautiously since the study was not adequately powered for making such comparisons which resulted in skewed distributions in some of the subgroups. Hence, further studies involving a larger sample size are warranted to substantiate our findings.

CONCLUSION

Knowledge and attitude regarding cough and its management is not adequate among patients and pharmacists, which in turn had a negative impact on their behaviour. Overall, 30.7% patients and 70% pharmacists in India have low level of knowledge and ~80% participant's lack positive attitude regarding cough management. In spite of some participants having high knowledge level, the same is not corroborated with their attitude and behaviour. This study thus shed light on the lack of relevance given by pharmacists towards desirable drug-dispensing practices as well as the lack of awareness amongst patients, in Indian context. This necessitates an approach targeting awareness through education programs and reconsideration of healthcare policies, for the effective management of cough.

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