

Factors Driving Self-medication with Antimicrobials in Karaikal, Puducherry, India

Devashree Mktan, Syed Ilyas Shehnaz¹

IV Year MBBS, Jawaharlal Institute of Postgraduate Medical Education and Research, Karaikal, Puducherry, ¹Department of Pharmacology, Saveetha Medical College and Hospital, Chennai, Tamil Nadu, India

Abstract

Aims: To determine factors driving individuals to self-medicate with antimicrobials and to ascertain the prevalence and practice of consumption of nonprescribed antimicrobials in Karaikal district of union territory of Puducherry, India. **Materials and Methods:** A structured, validated questionnaire was used to collect data from 504 patients and their relatives visiting the General Hospital, Karaikal. A picture containing a collage of various commonly purchased antimicrobials were shown to the participants to help them recall their SMA in the past 6 months. Data analysis was performed using SPSS version 25. Bivariate and multivariate logistic regressions revealed factors affecting SMA. **Results:** One-third of the participants (33.9%) reported SMA in past 6 months with prevalence significantly affected by male gender (adjusted odds ratio [OR] = 1.83; 95% confidence interval [CI]: 1.2–2.79), a preference for SMA during minor illnesses (adjusted OR = 3.05; 95% CI: 1.77–5.25) and a history of SMA among family members (adjusted OR = 3.43; 95% CI: 2.16–5.43). The most commonly self-prescribed drug was amoxicillin (55.2%) and the antimicrobials were mostly obtained from pharmacies (91.8%). Self-prescribed antimicrobials were commonly used to treat cold, cough, and fever. Our participants had self-medicated with antimicrobials because they found it easier to do so (32.2%) and as it saved them time (35.7%) and money (32.2%). **Conclusions:** The prevalence of SMA was found to be high in Karaikal. This misuse of antimicrobials can be lowered by approaching societal-cultural practices through community education, the supply-demand chain through stricter regulations of pharmacies, and enforcing health policies for rational use of antimicrobials.

Keywords: Antimicrobials, cross-sectional study, India, Puducherry, questionnaire, self-medication

INTRODUCTION

Global antimicrobial consumption has increased substantially in the past two decades.^[1,2] Antimicrobials are indispensable in clinical practice, especially in countries like India, where the infectious disease burden is among the highest in the world.^[3] The success of antimicrobial therapy critically depends on the use of drugs which are active and effective against common pathogens. Hence, the outcome is beneficial for the patient when antimicrobial drugs are used against a vulnerable pathogen.^[4] Nevertheless, habitual use of antimicrobials at the population level is linked to the rise of bacterial resistance, narrowing the effective range of the available drugs. The increased resistance is a result of many factors, but the leading cause is the overall volume of antimicrobial consumption. With each use, whether appropriate or not, the probability of the development and spread of antibiotic-resistant bacteria escalates.^[5,6]

India has legislated policies such as schedule H1 that restricts the dispensation of several antimicrobial classes without

prescription^[7] and health-care societies have collaborated with the WHO to release strategies such as the 2012 Chennai Declaration, a 5-year plan focused on the practical implementation of antibiotic policies in India.^[8] Despite many such measures, in developing countries, antimicrobials can be obtained easily from pharmacies without a prescription,^[9,10] and self-medication is rampant for common ailments^[11] and inappropriate antimicrobial use is persistent.^[12] A study conducted among dental patients in Chennai, India, revealed that nearly 71.2% self-medicated with antimicrobials^[13] while

Address for correspondence: Syed Ilyas Shehnaz,
Department of Pharmacology, Saveetha Medical College and Hospital,
Chennai - 602 105, Tamil Nadu, India.
E-mail: shehnazilyas@yahoo.com

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another study from Kerala, India, showed that 18% purchased antibiotics without a prescription.^[14] In Sudan too, 73.9% of the study population had used antimicrobials or antimalarials without a prescription within 1 month before the study.^[15] and in Jordan, 40.7% had self-medicated with antibiotics.^[16] Not only developing countries but developed countries have also had high rates of self-medication with antimicrobials (SMA). Studies in Greece,^[17] Italy^[18] and Lithuania^[19] found SMA in 44.6%, 3% and 22% of respondents, respectively. In the USA too, 17% of patients had taken “left-over” antibiotics without consulting their physician.^[20]

Predictors of SMA included age, female gender, previous experience with antimicrobials, severity of illness, patient education, advice from friends, and socioeconomic status.^[21,22] Other independently associated factors such as health-care utilization, the proximity of pharmacies, and increased waiting time in health-care facilities, also appear to be significantly associated with SMA.^[22,23]

Bacterial resistance is a widespread issue but is especially problematic in developing countries.^[5] Maintenance of antimicrobial success is a universally shared responsibility, but the actions needed to achieve this goal cannot be decided globally. Each region must adopt approaches adapted to its own conditions. Inquiring the general public directly and recognizing the reasons and rationale of individuals for SMA enables the formation of effectual strategies that directly tackle these key influencers. However, to the best of our knowledge, no studies have been done in Karaikal district to find out the extent of this problem. Hence, we aimed to determine the factors driving individuals to self-medicate with antimicrobials and to ascertain the prevalence and practice of consumption of self-prescribed antimicrobials in Karaikal, Puducherry, India. The results of our study may assist the authorities in the implementation of context specific guidelines for Karaikal, Puducherry, which may reduce the rate of SMA and thereby lowering the pace of antimicrobial resistance in this region.

MATERIALS AND METHODS

Study design and setting

Our cross-sectional study was conducted between June 2018 and September 2018 outside the Government General Hospital (GH) of Karaikal, Puducherry. The data were collected through a structured validated questionnaire during the daytime and on weekdays after obtaining the institutional ethics committee clearance. Before administering the questionnaire to the participants, a brief introduction of the study was given. After receiving verbal consent to carry out the study, an informed consent document and written consent form in Tamil, the regional language, were given to the participant to obtain written consent as well. In the case of illiterate participants, an interviewer assisted questionnaire was administered.

Study population and subject selection

A convenience sample of all patients and their relatives

visiting the GH formed the study population. The sample size was calculated using OpenEpi Software 3.01 version for windows (www.OpenEpi.com, Copyright (c) 2003, 2008 Andrew G. Dean and Kevin M. Sullivan, Atlanta, GA, USA) with the prevalence rate of SMA assumed to be 11.6%,^[24] confidence interval (CI) of 99.9%, and 5% absolute precision. The estimated sample size was 444, which was rounded off to 500. Only adult residents of Karaikal, Puducherry (>18 years) were included in the study. Individuals with disabilities that would hamper their understanding of the questionnaire and individuals from medical/paramedical fields were excluded.

Study questionnaire and validation procedure

The questionnaire was developed from a literature review^[12,23-25] and series of focus group discussions with subject experts (two pharmacologists, one clinical pharmacist, one epidemiologist, and one internal medicine specialist). Subsequently, the questionnaire was content-validated by the same subject experts, and misperceptions in the statements were corrected after pilot-testing.

Operational terms pertinent to the study (*self-medication, doctor, and antimicrobials*) were clearly defined. SMA in the past 6 months was judged to avoid recall bias.

The questionnaire was divided into the following parts with both open-ended and close-ended questions:

1. Sociodemographic details
2. Prevalence of purchase of nonprescription antimicrobials
3. Factors driving SMA
4. Antimicrobials self-medicated and sources of antimicrobials procurement
5. Reasons for purchasing antimicrobials without prescriptions
6. Signs and symptoms for which antimicrobials were purchased.

A picture containing a collage of various commonly purchased antimicrobials were shown to the participants to help them recall their SMA. The collage was put together from inquiries made at the pharmacy at GH, Karaikal, and a few pharmacies nearby. Frequently purchased brands of beta-lactam antibiotics, macrolides, fluoroquinolones, nitroimidazoles, etc., were included in the collage. An option to indicate SMA other than those in the collage was also provided.

The questionnaire was back-translated to Tamil, with participants given the option to respond in either Tamil or English. Their responses, if in Tamil, were translated back to English while recording the data.

Data analysis

Data analysis was done using SPSS version 25 (IBM Corporation, Armonk, New York, USA). Descriptive statistics were used, and Pearson's Chi-square test was used to determine the associations between different variables. Variables found significantly associated with SMA ($P < 0.05$) in the bivariate analysis were included in the multiple logistic regression model, and the odds ratio (OR) and corresponding

95% CIs were generated. Sections 3–6 of the questionnaire had the option for multiple responses, and therefore, the percentages did not always add up to a total of 100%.

RESULTS

Sociodemographic characteristics of the study population

Five hundred and twenty-six people participated in the survey. However, 22 questionnaires were incomplete, and therefore, only 504 responses were considered. Majority of the respondents were between the ages of 31 and 55 years (52.2%), males (61.3%), college-educated (31.3%), married (69%) and with a monthly income of ₹5001–10,000 (36.7%) [Table 1].

One-third of our participants (33.9%) reported SMA in the past 6 months with the prevalence significantly affected by gender (crude OR = 1.94; 95% CI: 1.31–2.89). Age, education level, and economic or marital status did not influence the practice of SMA [Table 1].

Factors driving self-medication with antimicrobials

The majority of the self-medicating participants consulted doctors only once or twice in 6 months (23.4%), self-reported good quality of health (21.6%), and preferred Government Hospitals during minor illnesses (19%). SMA was significantly more present in respondents *not* utilizing private health-care services during minor illnesses (crude OR = 0.62; 95% CI: 0.41–0.94); those preferring SMA during minor illnesses (crude OR = 3.97; 95% CI: 2.39–6.6) and those with family members practising SMA (crude OR = 3.83; 95% CI: 2.47–5.93). No gender

differences were observed with regard to these factors. Other factors such as consultation with a doctor in the past 6 months, self-reported quality of health, utilization of public health-care services during minor illnesses and presence of family/friend in healthcare did not affect the practice of SMA [Table 2]. Multivariate analysis revealed that male gender, a preference for SMA during minor illnesses and familial influence showed an increased risk for SMA. However, the association between SMA and preference for private healthcare was not maintained [Table 3].

Sources of antimicrobial procurement

The majority of participants bought their antimicrobials from pharmacies (91.8%). Relatives and friends (5.8%) and stocks kept at home (4.1%) were other sources of antimicrobials. No significant gender differences were revealed for the sourcing of antimicrobials.

Frequency of self-medication with antimicrobials

The majority of participants self-medicated once in the past 6 months (38.6%). The frequency of SMA in the past 6 months was significantly associated with marital status, self-reported quality of health, and consultations with the doctor. No other factor influenced the frequency of SMA [Table 4].

Antimicrobials self-medicated and disease symptoms

The most commonly self-medicated antimicrobials were amoxycillin (55.2%), azithromycin (12.5%), and ciprofloxacin (11.4%). Males preferred amoxycillin significantly more than females ($P = 0.019$), whereas

Table 1: Sociodemographic characteristics of the study population ($n=504$)

Sociodemographic characteristics	Number of participants Self-medicating with antimicrobials (%)	Number of participants not Self-medicating with antimicrobials (%)	Total number of participants (%)	<i>P</i>
Age (years)				
18-30	73 (14.5)	118 (23.4)	191 (37.9)	0.276
31-55	83 (16.5)	180 (35.7)	263 (52.2)	
56-90	15 (3)	35 (6.9)	50 (9.9)	
Gender				
Male	122 (24.2)	187 (37.1)	309 (61.3)	0.001
Female	49 (9.7)	146 (29)	195 (38.7)	
Level of education				
Illiterate	12 (2.4)	16 (3.2)	28 (5.6)	0.450
Incomplete high school	42 (8.3)	101 (20)	143 (28.4)	
High school	23 (4.6)	40 (7.9)	63 (12.5)	
College	59 (11.7)	99 (19.6)	158 (31.3)	
Postgraduate	35 (6.9)	77 (15.3)	112 (22.2)	
Average monthly income				
≤₹5000	33 (6.5)	63 (12.5)	96 (19)	0.160
₹5001-10,000	59 (11.7)	126 (25)	185 (36.7)	
₹10,001-20,000	52 (10.3)	77 (15.3)	129 (25.6)	
>₹20,000	19 (3.8)	34 (6.7)	53 (10.5)	
No income	8 (1.6)	33 (6.5)	41 (8.1)	
Marital status				
Married	113 (22.4)	235 (46.6)	348 (69)	0.302
Unmarried	58 (11.5)	98 (19.4)	156 (31)	
Total	171 (33.9)	333 (66.1)	504 (100)	

Table 2: Factors driving self medication with antimicrobials (n=504)

Factors	Number of participants Self-medicating with antimicrobials (%)	Number of participants not Self-medicating with antimicrobials (%)	Total number of participants (%)	P
Consult with doctor in past 6 months				
Once or twice a month	53 (10.5)	102 (20.2)	155 (30.8)	0.933
Once or twice in 6 months	118 (23.4)	231 (45.8)	349 (69.2)	
Self-reported quality of health				
Outstanding	20 (4)	50 (9.9)	70 (13.9)	0.153
Good	109 (21.6)	224 (44.4)	333 (66.1)	
Poor	42 (8.3)	59 (11.7)	101 (20)	
Preference during minor illness				
Government hospital	96 (19)	182 (36.1)	278 (55.2)	1.751
Private clinic	44 (8.7)	119 (23.6)	163 (32.3)	0.023
Self-medication	47 (9.3)	29 (5.8)	76 (15.1)	<0.001
SMA among other family members				
Yes	65 (12.9)	46 (9.1)	111 (22)	<0.001
No	106 (21)	287 (56.9)	393 (78)	
Family/friend in healthcare				
Yes	65 (12.9)	120 (23.8)	185 (36.7)	0.663
No	106 (21)	213 (42.3)	319 (63.3)	

SMA=Self-medication with antimicrobials

Table 3: Multivariable analysis of factors driving to self medication with antimicrobials factors

Factors	Adjusted OR	95% CI		P
		Lower	Upper	
Gender				
Female	1.00	-	-	0.005
Male	1.829	1.2	2.79	
Preference for private clinic during minor illness				
No	1.00	-	-	0.125
Yes	0.706	0.45	1.10	
Preference for self-medication during minor illness				
No	1.00	-	-	<0.001
Yes	3.052	1.77	5.25	
SMA among other family members				
No	1.00	-	-	<0.001
Yes	3.428	2.16	5.43	

SMA=Self-medication with antimicrobials, CI=Confidence interval, OR=Odds ratio

females self-medicated significantly more with azithromycin ($P = 0.021$). No other factor influenced the preferences for antimicrobials. Cough, cold, sore throat (37.9%), and fever-body ache (31.8%) were the most common conditions for which participants self-medicated. Amoxycillin was the most preferred antibiotic for both these conditions. A significant association of amoxycillin with cough, cold, sore throat ($P < 0.001$) and Tinidazole with dental pain ($P < 0.001$) was observed [Table 5].

Reasons for self-medication with antimicrobials

The survey found the most common reasons given for SMA were to save time (35.7%); lower the expenses (32.2%) and for convenience (32.2%) [Figure 1]. Married respondents selected convenience significantly more ($P = 0.02$) than the unmarried participants as a reason for SMA.

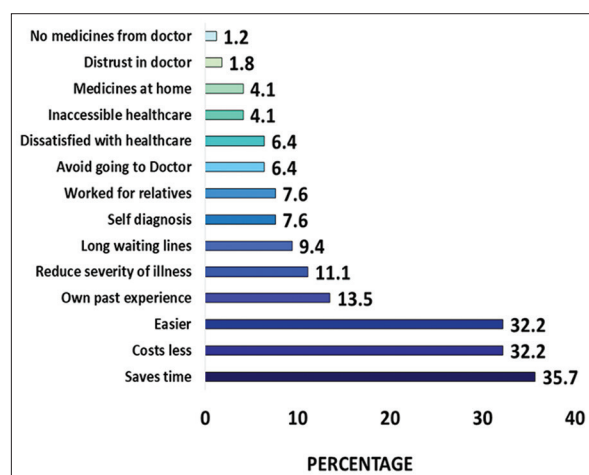
The middle-aged and elderly respondents also identified saving of time significantly more ($P = 0.03$) than the younger age groups. Moreover, previous experience with SMA was significantly ($P < 0.001$) identified as a reason by participants having some family or friends in healthcare versus those without any acquaintance in healthcare.

DISCUSSION

In our study, the prevalence of SMAs in Karaikal, Puducherry was reported to be 33.9%. Our results are comparable to the prevalence of SMA in the urban population of Chandigarh (39%)^[26] and Kolkata (41.2%)^[27]. However, both higher (Chennai; 71.2%)^[13] and lower (Kerala; 18%)^[14] prevalence rates have been reported elsewhere. When compared to other countries, higher (Saudi Arabia: 78.7%;^[22] Sudan:

Table 4: Frequency of self-medication with antimicrobials in past 6 months

Factors	Once (%)	Twice (%)	≥3 times (%)	Total number of participants (%)	P
Marital status					
Married	37 (21.6)	38 (22.2)	38 (22.2)	113 (66.1)	0.036
Unmarried	29 (17)	10 (5.8)	19 (11.1)	58 (33.9)	
Self-reported quality of health					
Outstanding	9 (5.3)	6 (3.5)	5 (2.9)	20 (11.7)	<0.001
Good	47 (27.5)	36 (21.1)	26 (15.2)	109 (63.7)	
Poor	10 (5.8)	6 (3.5)	26 (15.2)	42 (24.6)	
Consult with doctor in past 6 months					
Once or twice a month	11 (6.4)	12 (7)	30 (17.5)	53 (31)	<0.001
Once or twice in 6 months	55 (32.2)	36 (21.1)	27 (15.8)	118 (69)	
Total	66 (38.6)	48 (28.1)	57 (33.3)	171 (100)	

**Figure 1: Reasons for self-medication with antimicrobials**

73.9%^[15]) and lower (Bangladesh: 26.7%^[28] Italy: 23%^[18] Lithuania: 22%^[19] USA: 17%^[20]) prevalence rates have been reported. Almost comparable rates have been observed in Jordan (40.7%)^[16] Greece (44.6%)^[17] and Ethiopia (47.1%).^[23] Akin to our study, the recall period for many studies was 6 months,^[13,16,22,23,26] whereas shorter (2 weeks^[14] and 3 months^[27]) and longer recall periods (1 year^[17-20]) have also been reported.

Our study found that SMA was significantly affected by the male gender, preference for SMA during minor illnesses and familial influence. Our finding that males tend to self-medicate more than females is consistent with findings from other studies conducted in Ethiopia^[23] and Sudan^[15] but contradictory to the results from Italy^[18] and the USA.^[20] We presume that this may indicate the patriarchal dominance in the developing countries in contrast to the more developed societies of the western world. Comparable to our study, Keralite respondents have also identified the presence of acute minor illnesses as a predictor for SMA in contrast to those suffering from chronic diseases such as hypertension, diabetes, asthma, or coronary artery diseases.^[14] The presence of chronic diseases warrants frequent consultations, which may forego the impulse to self-medicate. This is also corroborated by the fact that self-medication was infrequent among our respondents who self-reported poor

health or who regularly accessed healthcare compared to those with perceptions of relatively good health or occasional doctor consultations, respectively [Table 4].

To the best of our knowledge, no study quoting familial influence was reported, but Saudi respondents were found to be influenced by friend's advice.^[22] Analogous to our study where self-medicating participants did not utilize private health-care services, Ethiopian respondents receiving private healthcare were also *less* likely to self-medicate.^[23]

Unlike our study which reported no association of SMA with respect to age, education or income, it was observed that middle aged, middle class Jordanians,^[16] middle-aged, highly educated Sudanese,^[15] Italians^[18] and Americans^[20] practiced SMA significantly more than other groups. Educated Keralites and those dissatisfied with their doctors were more inclined towards SMA.^[14] Other rare factors associated with SMA were white collared occupation, rural residence, absence of chronic disease^[19] proximity to pharmacies^[22] prolonged waiting time^[23] and frequency of buying self-medicated antimicrobials.^[23]

Pharmacies were the main source where antimicrobials were obtained for self-medication similar to other studies.^[15-17,19] In contrast to our study where friends (6%) and left-over stocks at home (4%) were minimally accessed, other studies have reported a higher rate for left-over antimicrobials (36%^[16] 23.2%^[19] 15.3%^[17] 12%^[15]) and friends (19.2%^[15] 10%^[16] 7.2%^[17] 6.1%^[19]) as other sources for SMA.

Regarding the frequency of SMA, most of our respondents (38.6%) self-medicated at least once in the past 6 months. Similarly, more than half of Lithuanians took antimicrobials at least once a year.^[19] Nevertheless, dental patients from Chennai were self-medicating more frequently, with 17.4% taking antibiotics more than once in 2 months; 40.5% more than once in 6 months and 13.3% very frequently.^[13] As the frequency of buying self-prescribed antimicrobials was reported to be significantly associated with SMA,^[23] enquiring about the regularity of self-medication is also of vital importance, especially among our married and relatively

Table 5: Antimicrobials self-medicated and disease symptoms

Disease symptoms	Amoxycillin	Ciprofloxacin	Cephalexin	Doxycycline	Cefixime	Azithromycin	Tinidazole	Norfloxacin	Total
Cough, cold, sore throat	85* (23.7)	12 (3.3)	5 (1.4)	6 (1.7)	5 (1.4)	15 (4.2)	7 (1.9)	1 (0.3)	136 (37.9)
Fever, body ache	69 (19.2)	10 (2.8)	3 (0.8)	4 (1.1)	3 (0.8)	18 (5.0)	6 (1.7)	1 (0.3)	114 (31.8)
Abdominal pain	8 (2.2)	5 (1.4)	-	1 (0.3)	2 (0.6)	4 (1.1)	2 (0.6)	-	22 (6.1)
Dental pain	10 (2.8)	2 (0.6)	1 (0.3)	1 (0.3)	1 (0.3)	-	8* (2.2)	-	23 (6.4)
Urinary tract infection	3 (0.8)	4 (1.1)	-	1 (0.3)	2 (0.6)	1 (0.3)	1 (0.3)	-	12 (3.3)
Menstruation problems	1 (0.3)	-	-	-	-	1 (0.3)	2 (0.6)	1 (0.3)	5 (1.4)
Diarrhoea	6 (1.7)	3 (0.8)	-	-	3 (0.8)	3 (0.8)	1 (0.3)	-	16 (4.5)
Skin problems	16 (4.5)	5 (1.4)	2 (0.6)	1 (0.3)	-	3 (0.8)	3 (0.8)	1 (0.3)	31 (8.6)
Total	198 (55.2)	41 (11.4)	11 (3.1)	14 (3.9)	16 (4.5)	45 (12.5)	30 (8.4)	4 (1.1)	359 (100)

*P<0.001

healthy participants who do not access healthcare often [Table 4].

The most common self-medicated antimicrobial in our study was amoxycillin (55.2%), a finding consistent with other studies done in Jordan,^[16] India^[14,26] Sudan,^[15] Greece^[17] and Saudi Arabia.^[22] Unlike our population, Sudanese respondents also self-medicated with antimalarials (43.4%)^[15] and Bangladeshi respondents with metronidazole (50.43%),^[28] probably due to high prevalence of malaria and gastro-intestinal infections in these countries, respectively.

Our study found that 37.9% used nonprescribed antimicrobials for cold, which is a viral condition, known to not require any antimicrobial treatment. Similarly, other studies in India,^[14,26] Sudan,^[15] Jordan,^[16] Greece,^[17] Lithuania,^[19] Saudi Arabia^[22] and Ethiopia^[23] also reported that majority of self-medicated antimicrobials were used for upper respiratory tract infections. Unlike these studies, diarrhea, dysentery, and food poisoning were commonly treated by self-medication in Bangladesh, which was also consistent with Metronidazole being the most common antimicrobial self-medicated there.^[28]

Our participants self-medicated with antimicrobials because they found it easier to do so (32.2%) and as it saved them time (35.7%) and money (32.2%). A smaller percentage partook the practice due to previous experience with SMA (13.5%) and to reduce the severity of illnesses (11.1%). Most of these reasons have been recognized in other studies as well and indicate common issues faced by patients globally.^[15,16] Previous experiences with antimicrobials have been significantly associated with SMA among Ethiopian respondents.^[23] However, the study among dental patients in Chennai reported the availability of left-over stocks from previous prescription (39%) and nonserious nature of the illness, which did not require a doctor's consultation (34%) as justifications for SMA.^[13]

In view of our findings, we recommend that antimicrobial misuse needs to be tackled on three fronts: consumer-end, the health-care professionals, and the providers of antimicrobials. As regards the end-consumers of antimicrobials, their confidence in antimicrobial knowledge gained from the previous experiences of their own (13.5%) or their relatives (7.6%) and self-diagnostic ability (7.6%) as justifications for self-medication [Figure 1], indicates misconceptions about the safety of the antimicrobials. In addition, this confidence is significantly enhanced in participants with personal associations with health-care professionals. Although understandable how one might learn from such experiences, that alone does not instil in a layperson, the vast concepts of microbial pathogenicity. The societal acceptance of SMA, use of left-over antimicrobial stocks, and advice from family/friends are additional contributing factors that need to be addressed. Hence, public health education programs through various media should clear these fallacies about the misuse of antimicrobials among the general population. The emphasis on these vital drugs losing their efficacy due to bacterial resistance,

as a consequence of misuse, could be the take-home warning messages of these campaigns.

Though the confidence of the respondents in public healthcare is evident by the fact that the majority access Government hospitals for minor illnesses [Table 2], this can be further boosted by improving the doctor-patient relationships in the public hospitals of Karaikal. Moreover, the reported prolonged waiting time (9.4%), dissatisfaction with healthcare (6.4%), inaccessibility to healthcare (4.1%), distrust in doctors (1.8%), etc., as justifications for SMA [Figure 1] should be remedied. Physicians should also instruct the patients that the prescribed medication is indicated only for the current condition, and the prescriptions should not be reused later. Additionally, since familial influence was a significant predictor for SMA in our study, education of the family members should certainly be attempted by the family physicians. It should be ensured that all members of the community are made aware of the problems with inappropriate antimicrobial use and discouraged to use of antimicrobials without the superintendence of a certified doctor.

The practice of SMAs perpetuates mainly because of the leniency in the regulation of pharmacies and how they operate coupled with a lack of knowledge of adversities that could stem from using inappropriate medications. Strict regulations must be brought about to check pharmacies and prevent the sale of nonprescribed antimicrobials. The purchase of unsupervised antimicrobials is more likely to lead to improper dosing or duration of therapy.^[29,30] Soliciting the cooperation of pharmacists and pharmaceutical companies in educating their consumers through personal counselling or educational campaigns may translate into higher gains in controlling the SMAs.

Our study is the first in this region which sheds light on the motives behind SMA among the general population of Karaikal, Puducherry. However, the limitations of our study are the self-reported nature of data, the small sample size and the nonprobability sampling design due to which it may not be possible to generalize the results. Nevertheless, given the paucity of previous research in this region, we consider that our study contributes to increasing the knowledge of antimicrobial use in this population.

CONCLUSIONS

Our study revealed that the prevalence of SMAs was high in Karaikal, Puducherry. Male gender, a preference for SMA during minor illnesses and familial influence were the independent factors driving the use of antimicrobials without prescriptions.

The high prevalence of self-prescribed antimicrobials can be lowered by approaching the societal-cultural practices through community education, the supply-demand chain through stricter regulations of pharmacies, and enforcing health policies for rational use of antimicrobials.

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Conflicts of interest

There are no conflicts of interest.

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