

**Prevalence of self-medication under different climatic conditions within the urban population of Tamil Nadu**

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**Abstract**

**Objective:** The paper was aimed to assess the prevalence of self-medication with traditional substances under different climatic conditions in the urban population of Chidambaram, TamilNadu.

**Materials and methods:** The study was conducted for a period of twelve months. We selected as ample size of 125 households using random sampling techniques and pretested semi-structured questionnaire. Socio-demographic variables were assessed as explanatory variables. Association between explanatory and outcome variables was tested using the Chi-square test. The level of significance was set at <0.05. SPSS (Version 21) and Microsoft Excel were used for statistical analysis.

**Results:** Self-medication with traditional substances was most prevalent during the rainy season (89.50%). The most common home remedies used were thuduvalai (Purple fried pea eggplant) (24.8%), followed by pudina (Mint leaves)(17.7%) and inji (ginger), 13.2%. During winter, summer, and rainy seasons, most commonly used substances were milagu(Tailed pepper), sundakkai(Turkey berry), sukku(Dried Ginger), karpuravalli(Indian mint), inji(Ginger), nilavembu(Andrographis); kollu(Horse gram) and pudina(mint leaves); and tulsi(Holy basil), venthayakeerai(Fenugreek) and nilavembu(Andrographis); respectively. Vallarai(Brahmi leaves), arugampul(Bermuda grass), and mudakkathan (Balloon plant) were equally used in all seasons. Self-medications were mostly used for cough and cold (53.1%), followed by dyspepsia (24.7%). Majority of the participants (58.7%) in the study consumed self-medications for 2 days.

**Conclusion:** From the study, it was concluded that most commonly used remedies were thuthuvalai (24.8%), pudina (17.7%), and inji (13.2%). Most common complaints for which the home remedies were used were cough and cold (53.1%), followed by diarrhea and dyspepsia (24.7%).

**Keywords:** Attitude, awareness, home remedies, self-medication

**Introduction**

Self-medication is an age-old practice, and it is defined as obtaining and consuming drugs without the advice of a physician to treat self-diagnosed disorders or symptoms, or the intermittent or continued use of a prescribed drug for a chronic or recurrent disease or symptoms<sup>1</sup>. Some of the reasons for increase in the prevalence of self-medication include the urge to self-care, feeling of sympathy towards family members in sickness, lack of health services, poverty, ignorance, misbelief and availability of drugs in establishments other than pharmacies, etc<sup>2</sup>.

A large number of people in India do not consult health-care personnel, they either consult a drug store (retail pharmacy) and obtain medicine from the shelf, or procure the leftover medicine from a neighbour who may have suffered from a similar illness. Although such medications do not usually have any marked effect on the user, it can still be quite dangerous. The reported prevalence of self-medication varies with different countries and groups of people, such as 12.7% in Spain, 75% in southern Chile, 40-60% in Vietnamese, 98% in Palestinian students, 21.5% in Portuguese, and 61% Mexico. Even the developing countries have reported a prevalence of 12.7% to 95%. Around 37% and 31.3% of rural and urban Indian population shows self-medication<sup>(3,4,5,6,7,8,9,10,11)</sup> A limited number of studies have been conducted regarding the usage of self-medication. The present study was aimed to determine the self-medication practices and their prevalence under different climatic conditions among the urban population at Chidambaram, Tamil Nadu. Self-medication is very common among the educated population<sup>(12,13,14,15)</sup>. Modern educated consumers (patients) wish to play a greater role in the maintenance of their own health and are often competent enough to manage (uncomplicated) chronic and recurrent illnesses (not merely short-term symptoms) themselves after either proper self-diagnosis or seeking occasional professional advice. They are understandably unwilling to submit to the inconvenience of visiting a doctor for a condition that they believe they can manage by themselves<sup>(16)</sup>. However, this practice is often associated with risks, such as misdiagnosis, use of excessive drug dosage, prolonged duration of use, drug interactions, and polypharmacy. Furthermore, this practice especially poses additional danger to the children, elderly, and pregnant individuals<sup>(17)</sup>. Hernandez and Job defined self-medication as “the taking of drugs, herbs or home remedies on one's own initiative, or on the advice of another person, without consulting a doctor<sup>(18)</sup>.” It is worth mentioning that even some governments encourage following self-care approaches for minor illnesses, such as self-medication. When done appropriately, self-medication could help in markedly reducing the treatment cost, time to travel to the doctor's clinic, as well as consultation time<sup>(19)</sup>. Self-medication might lead to wastage of resources, elevation in pathogenic resistance, and several side effects, such as prolonged suffering and other adverse reactions. Hence, it becomes the responsibility of the government to manage responsible self-medication<sup>(20)</sup>. Responsible self-medication involves the use of non-prescription, safe, quality medicinal products for conditions that are easily self-diagnosed or for recurrent conditions that have been previously diagnosed by a physician<sup>(21)</sup>.

In a nutshell, self-medication is safe as long as the consumers have sufficient knowledge about its dose, time of intake, side-effect on over dose; however, in case of lack of knowledge, it can cause serious adverse effects, such as antibiotic resistance, skin problem, hypersensitivity, and allergy.

Developing countries like India generally have poor economic status, poor education status as well as, poor health care facilities. Thus, people in such countries usually lack complete information regarding the adverse events, to reduce the incidence of adverse events associated with self-medication, as holistic approach must be employed which includes appropriate awareness and education and restrictions on advertisements regarding products.

In the current study, we aimed to assess the prevalence rate of self-medication among the urban population of Chidambaram, Tamil Nadu. We assessed the prevalence rates during three months, with each month in separate seasons, winter, rainy, and summer, to assess the inter-seasonal variation in the rates. We hypothesized that there would be an inter-seasonal variation owing to the frequency and type of diseases for home remedies were self-administered, without any physician's consultation. We selected the urban areas of the city due to the well-accepted assumption that with increase in the level of resources, education, and awareness, the practice of self-medication also increases.

## **Materials and methods**

### ***Study type:***

This longitudinal community-based study was carried out in the urban field practice area in Chidambaram, Tamil Nadu, with a population of 12,525. The study was conducted for a period of twelve months commencing from October 2014, with the sample size of 125 households selected using random sampling techniques and pretested semi-structured questionnaire. The present study was conducted to determine the magnitude and pattern of usage of Self-medication for acute illness under different climatic conditions among urban population of Chidambaram.

### ***Sample size:***

The prevalence of self-medication consumption was assessed by a pilot study among the Chidambaram population. The pilot study conducted with 50 respondents from 50 households revealed 68% prevalence in the self-medication using home remedies. Hence, based on this result, we determined adequate sample size for this study in order to achieve 8.0% absolute permissible error and 95% confidence level.

$$\text{Sample size, } n = z^2 \cdot \frac{p(1-p)}{d^2} = 130.6$$

The total number of houses in our field practice area was 2850. Using correction factor for finite population,  $F = 1/(1+n/N)$ , we deduced the final sample size of the households to be 125.

### ***Sampling technique and selection criteria:***

We used a random sampling technique to select the households in the urban field practice area of Chidambaram. In the first stage of selection, each field practice area had 5 areas and 5 streets; a total of 23 streets were included in this study. In the second stage, we used lottery method to select 125 households from these 23 streets. In the third stage, the sample of households was selected using simple random sampling with a random start. People of all ages who suffered from an acute illness within the past one month of recruitment and were willing to participate were included in the study. If a member of a family worked in healthcare services, the family was excluded from the study. In addition, people with chronic illnesses were also excluded.

### ***Data collection:***

A semi-structured questionnaire approach was used, which included interview as well as checking for drugs and/or empty packets. The first part was aimed at collecting general information like the name of the primary respondent, address, mobile number, socio-demographic profile, such as age, sex, education, occupation, income, marital status, and socio-economic status (assessed using Modified Kuppuswamy Scale 2012). In addition, data regarding

the awareness about the Self medication home remedies and their usage and frequency of consumption was collected. We also collected other data regarding SM home remedies, such as name, whether purchased for self or others, names of family members who consumed, any complaints/side effects arising due to consumption, period between commencement of ailment and commencement of SM consumption, the symptom relieved, whether any expert opinion was procured and name of the said expert, source of information, details regarding discontinuation and reuse, and the frequency in which the SM actually provided cure/relief.

### ***Statistical analysis:***

We performed the descriptive analysis for the data collected from 612 participants. The categorical data were presented in the form of frequency and percentage. The quantitative data was presented as mean and standard deviation. SM consumption data was documented for each episode of SM intake. The intake and usage pattern for the SM home remedies during the three seasons were compared using cross tabulation.

Intake of SM during any season for any ailment was considered to be the primary outcome. The socio-demographic variables, including, age, gender, education, occupation, and socio-economic status of the person were considered as explanatory variables. The association between explanatory and outcome variables was tested using the Chi-square test. The level of significance was set at  $<0.05$ . IBM SPSS statistics, version 21 and Microsoft Excel were used for statistical analysis. Prior permission was obtained from the ethical committee of the institution for conducting the study.

## **Results**

### ***Frequency of self-medication under different seasons:***

We first assessed the frequency of households that used self-medications under different seasons. We assessed the usage of self-medication in 251, 246, and 237 households for one month in the winter, summer, and rainy seasons, respectively. As shown in Table 1, the highest frequency of usage of self-medication was observed in the rainy season (212, 89.5%), while the lowest frequency was observed in the summer season (193, 78.5%).

### ***Home remedies used for self-medication:***

Next, we measured the overall frequency of usage of each home remedy, regardless of the season. As shown in Table 2, thuthuvalai was the most commonly used home remedy (197, 24.8%), followed by pudina (140, 17.7%), and inji (105, 13.2%). On the other hand, the least commonly used remedy was tulsi (2, 0.3%).

In addition, we also observed that most commonly used remedies during winter, summer, and rainy seasons were milagu, sundakkai, sukku, karpuravalli, inji, and nilavembu; kollu and pudina; and tulsi, venthayakeerai, and nilavembu; respectively. Vallarai, arugampul, and mudakkathan were consumed with similar frequencies during all three seasons (data not shown).

### ***Pathological conditions responsible for self-medication:***

Next, we assessed which conditions were generally treated using home remedies. As shown in Table 3, home remedies were most commonly used to treat cough and cold (382, 53.1%), followed by dyspepsia (178, 24.7%). On the other hand, among all the conditions analyzed,

constipation was least frequently treated using home remedies (1, 0.1%). Figure 1 shows the season-wise distribution of usage of different home remedies for different pathological conditions. We observed that, during winter and rainy seasons, home remedies were most commonly used for treatment of cough and cold, and during the summer season, the most commonly treated ailment was dyspepsia.

Furthermore, none of the households consumed self-medications for constipation in the winter and rainy seasons. On the other end of the spectrum, the least number of households consumed self-medications for fever and cough and cold in the summer season.

#### ***Daily usage pattern of self-medications:***

Next, we assessed the season-wise pattern of daily usage of self-medication (Table 4). We observed that, during the winter, summer, and rainy seasons, most of the consumers self-medicated only once daily (186, 74.1%; 156, 63.4%; and 128, 54%; respectively). In winter and summer seasons, least frequencies were observed for self-medication twice daily (25, 10%; and 33, 13.4%; respectively), while in the rainy season, least number of households exhibited self-medication for four times (47, 19.8%). Furthermore, we also observed that most of the times, self-medications were consumed for three consecutive days (113, 17.2%), followed by consumption for only one day (80, 12.2%). On the other hand, self-medications were consumed least frequently for four consecutive days (9, 1.4%) (Table 5).

#### **Discussion:**

Our findings showed 62.8% overall prevalence of usage of OTC drugs for self-medication. Previous studies have shown that prevalence of self-medication varies widely across various countries and groups of population (4,10,11,12,13,14,15,22). In his community-based cross-sectional study in Sri Lanka, Wijesinghe et al. found that the prevalence rate of self-medication in rural areas (35.3%) was higher than that in urban areas (33.9%).<sup>(22)</sup> In his descriptive cross-sectional study, Kariyawasam et al. found that as high as 85% of mothers self-medicated their children in an urban area in Sri Lanka<sup>(23)</sup>.

Covington TR found that the consumers have more confidence in nonprescription drugs<sup>(24)</sup>. A survey by the National Council for Patient Information and Education revealed that 92% and 83% of consumers considered nonprescription drugs effective and safe, respectively (National Council on Patient Information and Education)<sup>(25)</sup>.

In the current study, 133 out of 192 (69%) users shared their drugs within family and friends. The major reasons for self-medication among our cases included minor illnesses that did not require immediate doctor's consultation (44%) (no need to go to a doctor immediately), followed by saving consultation fees (21.7%), much less distant pharmacy (15.1%), lack of time (11.9%), and non-availability of doctors (5%). Some studies have showed that the concept of SM has gained universal acceptance as it encourages an individual to treat minor illness with effective and simple remedies. Similar to our results, Shankar et al, from Nepal, found that self-medication was most commonly used for mild illnesses.<sup>10</sup> Homedes and Ugaldefound that short-duration ailments, such as headache/fever, and upper respiratory tract illnesses and gastrointestinal illnesses are usually relieved by simple homemade remedies and some OTC drugs<sup>(26)</sup>.

The correlation between the level of education and self-medication is still unclear. In this study, we found that 36% of subjects had completed high and middle school, and 30% were graduates. Nagalingam et al. reported that among his study cases that practiced self-medication, 43.8% were graduates and 38.5% had completed secondary school<sup>(27)</sup>. On the contrary, Kumar P showed that majority of his cases were illiterate (33.3%)<sup>(28)</sup>. Higher number of studies has reported that self-medication increased with higher education, and more generally, that self-care improves with general health awareness, Similar to the results of Nagalingam et al<sup>(27)</sup>, most of the subjects in the current study (79.3%) belonged to SES 1. Shankar PR<sup>10</sup> reported poor socio-economic status is one of the factors for self-medication.

The major home remedies, for which we studied the self-medication patterns, were inji, sukku, thuthuvalai, sundakkai, mudakatthan, arugampul, pudina, nilavembu, milagu, kollu, tulsi, karpuravalli, venthavayakeerai, and vallarai. Inji and sukku refer to garlic, which is a widely used spice that is widely known for its medicinal effects against high blood pressure, flu, and common cold. Thuthuvalai, also known as *Solanum trilobatum*, is primarily used for relief from respiratory ailments, such as bronchial asthma. Sundakkai, or turkey berry, is known to be effective against cold, flu, cardiovascular diseases, and diabetes. Mudakatthan, or balloon vine, is used to treat joint pain and other body pains, and aids in enhancing the body's immunity. Arugampul, also known as scutch grass, is primarily used for reducing inflammation, blood sugar, and kidney stones. Pudina, or mint, is globally used herb to enhance the flavor of food items and drinks; it is known to aid in digestion, and treat asthma, common cold, headache, and depression. Nilavembu, also called green chiretta, is primarily used to treat fever and other ailments that include high fever (such as malaria). Milagu refers to black pepper, which is another widely used spice and seasoning material; it is widely known for its anti-inflammatory and analgesic properties, sugar and cholesterol regulation, and anti-cancer activity. Kollu, or horse gram, is a less widely known bean and more widely used as a component of ayurvedic medicines; it is believed to be beneficial against high cholesterol, fever, peptic ulcers, etc. Tulsi, or holy basil, is an aromatic plant known to have innumerable health benefits, including countering respiratory ailments, high blood pressure, stress, gastrointestinal disorders, high blood sugar, infections, etc. Karpuravalli, or Mexican mint, is known provide relief against cold and cough, ulcers, and allergies. Venthayakeerai, or fenugreek, is known to reduce blood sugar and cholesterol, and incidences of cardiovascular and renal disorders. Vallarai, or *Centella asiatica*, is known to enhance overall immunity.

### Conclusion

Self-medication, despite its numerous risks, has become widely prevalent all over the world. However, different countries and groups of people exhibit varied prevalence rates for self-medication. Such large variation can be primarily owed to the level of education, awareness, and socio-economic status.

In this study, we observed marked inter-seasonal variation in the self-medication. We found that mostly minor ailments were treated using the self-medication. Self-medication was most prevalent during the winter and rainy seasons. Mostly cough and cold and dyspepsia were treated

with self-medication. The most commonly used home remedies for self-medication were thuthuvalai, pudina, and inji. Furthermore, vallarai, arugampul, and mudakkathan were consumed with similar frequencies across all seasons. In addition, we did not identify any significant variation in the duration of drug use for any season. However, we could not identify whether the level of education was significantly correlated with the prevalence rate of self-medication. In addition, there have been only a limited number of studies on self-medication prevalence, and hence, we could not conduct any comparative analysis. Future studies should focus on conducting such comparative analyses on the prevalence rates and causal factors of self-medication.

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### **Conflict of Interest**

The authors declared no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

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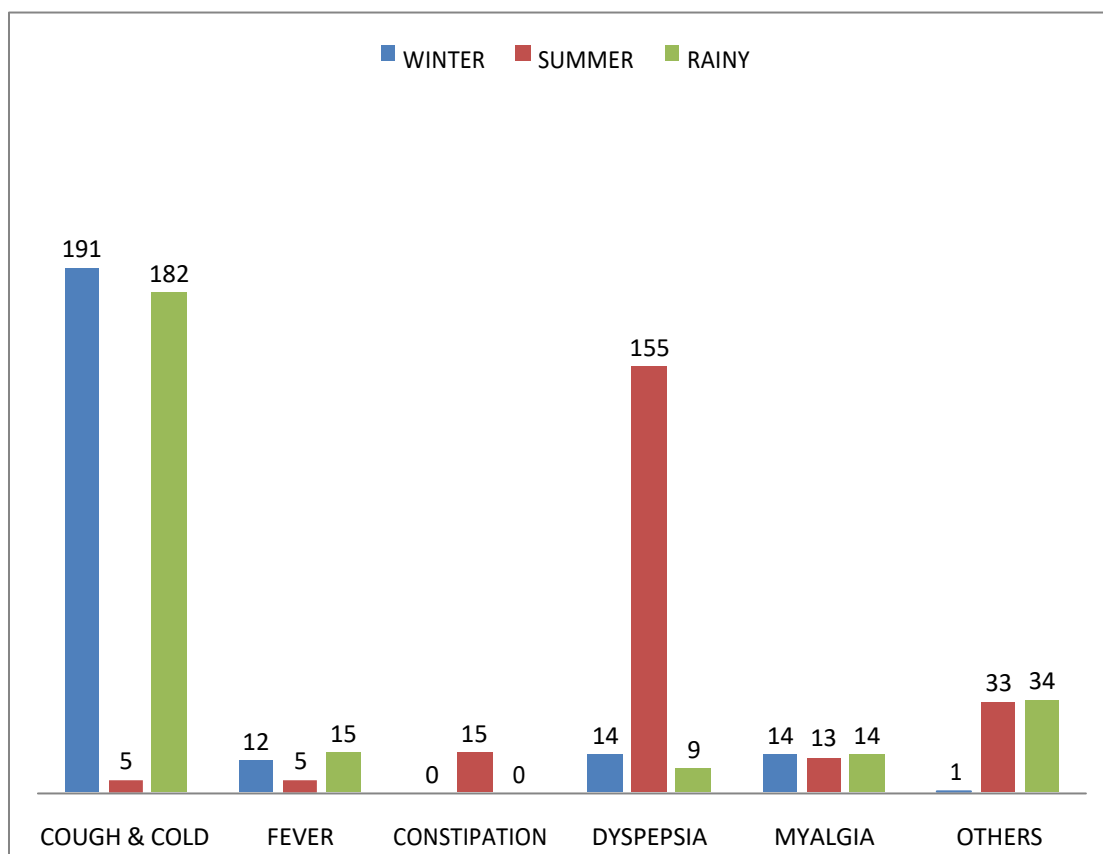
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**Figure 1: Season-wise home remedies usage****Table 1: Distribution of season-wise self-medication for one month**

<b>Parameter</b>	<b>Self-medication for 1 month</b>	
	<b>Yes</b>	<b>No</b>
Winter (n = 251)	209 (83.30%)	42 (16.70%)
Summer (n=246)	193 (78.50%)	53 (21.50%)
Rainy season (n=237)	212 (89.50%)	25 (10.50%)

Prevalence of self-medication observed more during Rainy season 89.50%

**Table 2: Distribution of Home remedies usage among study population**

Parameter	Frequency	Percentage
Inji (Ginger)	105	13.2%
Sukku (Dried Ginger)	37	4.7%
Thuthuvalai (Purple fried pea eggplant)	197	24.8%
Sundakkai (Turkey berry)	11	1.4%
Mudakatthan (Balloon plant)	30	3.8%
Arugampul (Bermuda grass)	92	11.6%
Pudina (Mint leaves)	140	17.7%
Nilavembu (Andrographis)	9	1.1%
Milagu (Tailed pepper)	25	3.2%
Kollu (Horse gram)	24	3.0%
Tulsi (Holy basil)	2	0.3%
Karpuravalli (Indian mint)	60	7.6%
Venthavayakeerai (Fenugreek)	13	1.6%
Vallarai (Brahmi leaves)	48	6.1%

\*Multiple response

Common three self-medication home remedies are Thuthuvalai ((Purple fried pea eggplant) 24.8%, Puhina (Mint leaves) 17.7% followed by Ginger 13.2% respectively.

**Table 3: Pattern of home remedies usage for various symptoms**

<b>Parameter</b>	<b>Frequency</b>	<b>Percentage</b>
Cough and cold	382	53.1%
Fever	32	4.4%
Constipation	1	0.1%
Dyspepsia	178	24.7%
Myalgia	31	4.3%
Others	96	13.3%

**\*Multiple response – MOST COMMONLY TAKEN FOR COUGH AND COLD 53.1%**

**Table 4: Distribution of season-wise usage pattern of self-medication**

<b>Parameter</b>	<b>Times/Day</b>		
	<b>One Time</b>	<b>Two Times</b>	<b>Four times</b>
Winter (n=251)	186 (74.1%)	25 (10.0%)	40 (15.9%)
Summer (n=246)	156 (63.4%)	33 (13.4%)	57 (23.2%)
Rainy (n=237)	128 (54.0%)	62 (26.2%)	47 (19.8%)

Season wise distribution of self-medication shows taken four times more in summer season (23.2%)

**Table 5: Distribution of usage pattern of self-medication according to duration**

<b>Parameter</b>	<b>Frequency</b>	<b>Percentage</b>
One day	80	12.2%
Two days	386	6.7%
Three days	113	17.2%
Four days	9	1.4%
Days or on/ off	70	10.6%

Usage pattern shows duration of three days were 17.2%