Identification of the most common Odours Recognizable in the South Indian Community: A Preliminary Survey

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ABSTRACT

Background: There is increasing medical evidence regarding olfaction disorders being a key to the diagnosis of diseases. However, there is a lack of a simple kit that can test the sense of smell in local populations; in the present case, the south Indian one.

Method: Creation, and dissemination, of a questionnaire to random cross-section of people domiciled in south India, to obtain a list of commonly recognized smells (odourants), followed by collating the results.

Results: Responses to the questionnaire were obtained from 135 individuals, listing a total of 651 odourants. Jasmine and Coffee were the top 2 odourants in the south Indian population; many others were also listed that indicated the local-specific nature of the sense of olfaction.

Conclusions: There is a need to create an olfaction kit using odourants that can be readily identified amongst a given set of people. The present survey has proved useful in identifying such a set applicable in the south Indian population.

Keywords: Olfaction, Questionnaire survey, Odorants

*See End Note for complete author details

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INTRODUCTION

The ability to identify various odours is used for the diagnosis of olfactory dysfunctions which are often the major clinical manifestations of neurosensory degenerative disorders, which can result from genetic predisposition, trauma, or old age.[1,2] Another important area, that is not yet very much in relevance in India, is the preoperative and postoperative olfaction test in nasal and some neurosurgical procedures, as a documentation of possible sequelae or complication of the cases.[3,4] Recently, the emergence of anosmia as a significant stand-alone symptom of COVID-19 hastened the need for olfaction testing.

The formal testing of smell mandates a set of standardized smells / odours, using substances familiar to the population being tested.[5] The international, standardized olfactory kits may not necessarily be effective to test the native South Indian. Hence there was felt a need to design an olfactory kit that is more appropriate for the targeted population. The first step in this direction would be to identify commonly recognizable odoriferous substances (odorants) in this population.

The present article describes this “first step”, which was a survey conducted by the medical students attached to the Otorhinolaryngology and Physiology

Departments, in order to identify the most commonly recognizable odourants amongst a cross-section of the South Indian people.

Study Centre

Amrita Institute of Medical Sciences, Kochi, Kerala

METHODOLOGY

The research group consisted of faculty of the Physiology and Otorhinolaryngology departments along with three undergraduate (UG) medical students. Discussions were held amongst us regarding the study plan, hypotheses, and the possible pathway. It was agreed that the easiest way to get a "first list" of "popular smells", especially from a wide cross-section of the intended population, would be to inquire via social media.

Inclusion criteria: Age 18 to 80, belonging to Kerala, Karnataka, Andhra Pradesh, Telangana and Tamil Nadu.

With this in mind, a questionnaire was created, centred around the basic inquiry about the individual respondent's list of commonly recognizable smells. Further details can be obtained from the questionnaire cited in Annexure. The basic question was to list seven (7) distinct smells that are easily recognisable to them. This number was chosen at random.

A Google Form was created of this questionnaire.

The UGs were entrusted the task of informing and distribution amongst as wide and random a population as possible. Accordingly, it was administered to friends, colleagues and family on various social media platforms. A time period of 2 weeks was given within which to respond. Respondents were assured that their identity would not be disclosed in any way, from the questionnaire results.

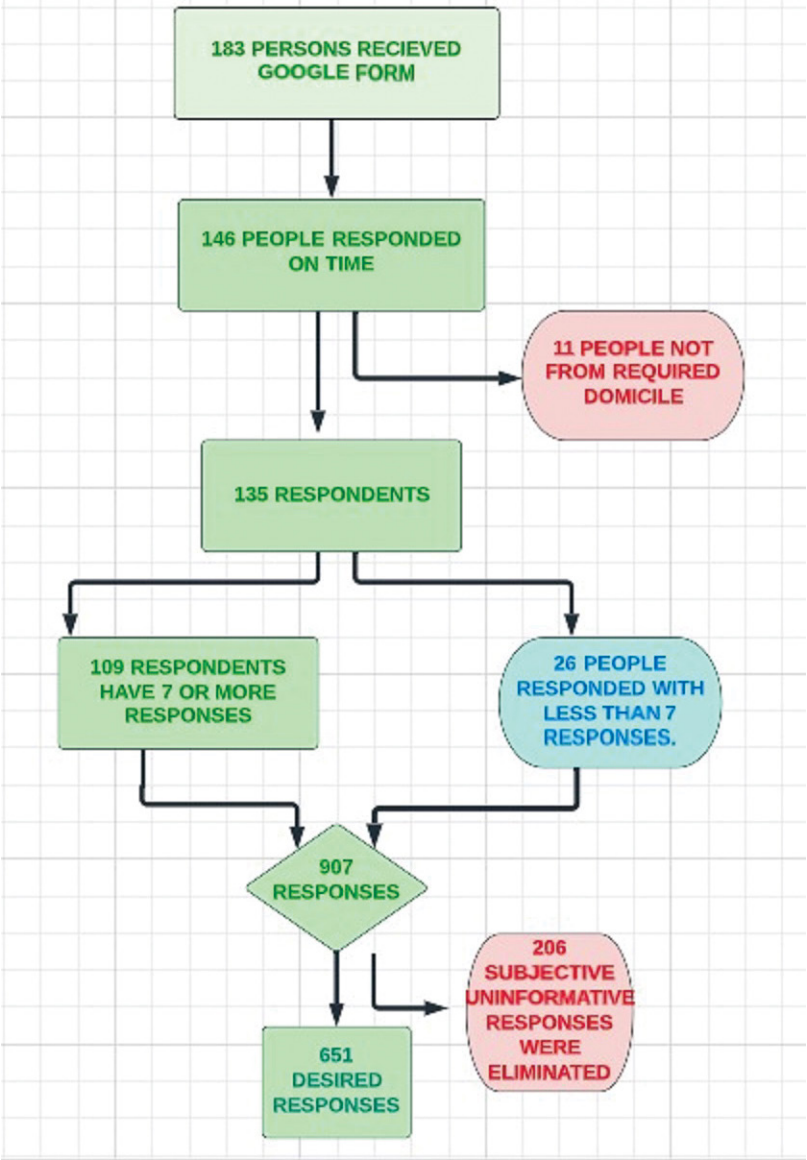

Figure 1. Showing the flowchart of the process of final selection of the odourants

Results were compiled and tabulated into Microsoft Excel.

RESULTS

The Google Form was accessed by 183 individuals. Of these, 146 responded within the time frame. 43 were males and 103, females. There were 11 respondents who were not from the intended domicile, and hence excluded. This meant that there were 135 individuals whose responses were analysed for the study.

Table 1. Shows the entire list of odourants mentioned by the respondents

Category	Type	Substances	Respondents
Non-Edible	Aerosols	Agarbattis	13
		Nail polish remover	4
		Hit spray	1
	Gas	LPG	9
		Cigarette	7
		Burning plastic	5
		Smoke	4
	Liquid	Petrol	24
		Sewage	12
		Dettol	7
		Kerosene	6
		Hand sanitizer	4
		Paint	2
		Fevicol	1
	Plants	Sandalwood	23
		Marigold	2
		Eucalyptus	2
		Jasmine	64
		Rose	32
	Solid	Vicks	3
		Talc	1
		Camphor	17
		Wood	3
		Books	2
		Naphthalene	2
		Cow dung	2
		Clay	1
Edible	Prepared	Egg	3
		Pickle	3
		Masala	2
		Tadka	2
		Vanilla	5
		Coriander Powder	4
		Ghee	7
		Fish	44
		Ghee sweets	2
		Dried prawns	1
		Betel leaf	1
		Almond oil	1
		Curry Leaf	14
	Raw	Coffee	45
		Coconut oil	35
		Mango	22
		Lemon	18
		Garlic	18
		Cardamom	17
		Jackfruit	16
		Tea	15
		Ginger	12
		Onion	11
		Orange	9
		Mint	8
		Asafoetida	8
		Clove	7
		Turmeric	7
		Pepper	7
		Chilli	7
		Cinnamon	7
		Tulsi	7
		Vinegar	7
		Alcohol	5
		Banana	3
		Cumin	2
		Pineapple	2
		Guava	2
		Apple	2
		Tamarind	2
		Nutmeg	2
		Bay leaf	1
		Watermelon	1
		Lemongrass	1
		Fenugreek	1
		Milk	1
		Papaya	

Table 2. Shows the entire list of odourants mentioned by the respondents

Odourant	N (No. of respondents)
Jasmine	64
Coffee	45
Fish	44
Coconut oil	35
Rose	32
Petrol	24
Sandalwood	23
Mango	22
Garlic	18
Lemon	18
Camphor	17
Cardamom	17
Jackfruit	16
Tea	15
Curry leaf	14

The mandate was to list 7 odourants. This was not exactly followed; 109 listed 7 or more substances, while 26 listed less than 7. Thus, the responses revealed a total of 907 odourants. The responses were further eliminated based on subjective, uninformative responses like "petrichor", "wind", "freshness", "perfume" etc. Substances that require multiple step preparations, like "biryani", "sambhar", "dosa", etc were also eliminated. This resulted in a final tally of 651 odourants that could be analysed. A flowchart summarizes this in **Figure 1.**

After excluding the overlaps, 74 different odours were identified. The most common one was Jasmine. A majority of the substances (47 out of 74) were edible items. Out of these, 35 were odours of raw substances (coffee, mango, coconut oil), while the other 12 were of prepared items (egg, fish, ghee sweets, dried prawns). 27 out of 74 responses were non edible items. The entire list is tabulated in **Table 1,** and the top 15 are listed in **Table 2.**

DISCUSSION

Questionnaires have been proven to be a useful way of conducting surveys.[6] Google Forms is a useful modality for disseminating questionnaires, although it mandates the need for some amount of technology familiarity on the part of both researcher and respondent.[7] There have been many attempts at local adaptations of international olfaction kits and identification of odorants in literature.[8,9] However, we could not specifically pinpoint the use of questionnaires for these.

The present study has benefited from the ease of data collection via mass administration of a questionnaire. The gender skew in the obtained responses in our study appears significant. There was no conscious inequality in the administration of the Forms. Hence, we consider the larger number of female responses to be purely coincidental, or a measure of the accessibility and/or interest taken by the womenfolk to be much more, for such activities.

Coming to our results, there were far more edible substances listed. The aspect of "flavour" of food is a combination of the smell and taste (amongst other features) of the edible substance. To quote from the work of Nobel Prize winner Linda Buck: Much of what we think of as the flavor of foods derives from information provided by the olfactory system.[10] Hence, it is no surprise that edible substances (both raw and cooked) come to mind most often in terms of their smell.

The smell of jasmine featured at the top of the list. Considering familiarity and prevalence of the substance, this was not a surprise. Jasmine is one of the most well-known of the fragrant flowering trees, with their centre of diversity being in South Asia and Southeast Asia.[11] The second odourant in our study was coffee. This agrees with most international reports, wherein the most recognized smell is coffee.[12,13]

One study cites Vanilla as the most pleasing odour across cultures.[14]

Although these are undeniably significant odourants, the question is of recognition and/or identifiability. To give a name to even the most pleasant smell is possible provided the individual is familiar with that substance. In this context, it is worthwhile spending a few minutes in comparing and contrasting the main substances in the international sets vis-a-vs our study. Peanut butter, Chocolate, Wintergreen oil, Beer have featured in the top 10 in the former; Fish, Coconut oil, Sandalwood, Mango have featured in our top 10. Needless to say, the latter group typifies products identifiable with the southern part of India. We feel that this is a validation of our hypothesis, in as much as "local flavour" must be sought out as components for an effective olfactory kit.

CONCLUSIONS

The survey managed to effectively utilize the Google Form as a means of administering the questionnaire, but with the respondents showing a skew to the female population.

Jasmine and Coffee were the two most commonly identified odorants in this survey, amongst a cross-section of the south Indian community.

A variety of substances, raw and prepared, edible and non-edible, were identified in the entire set.

The results from this survey can now be used to conduct a pilot study with the top 10-15 odorants, to score the recognition level of each one.

END NOTE

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Conflict of Interest: None declared

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