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Consensus analysis of *sastric* formulations used by non-institutionally trained *siddha* medical practitioners of Virudhunagar and Tirunelveli districts of Tamil Nadu, India

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ABSTRACT

Ethnopharmacological relevance: *Siddha* system of traditional medicine has been practiced in Tamil Nadu. This system of medicine has a high number of non-institutionally trained practitioners but studies on their traditional medicinal knowledge are not adequate. The present study is aimed to document and analyze the *sastric* (traditional) formulations used by the non-institutionally trained *siddha* medical practitioners in Virudhunagar and Tirunelveli districts of Tamil Nadu, India.

Methods: After obtaining prior informed consent, interviews were conducted with 115 non-institutionally trained *siddha* medical practitioners about the *sastric* formulations used by them for the treatment. Successive free listing method was adopted to collect the data and the data were analyzed by calculating Informant Consensus Factor (F_{ic}) and Informant Agreement Ratio (IAR).

Results: The study documented data regarding 194 *sastric* formulations and they were classified into plant, mineral and animal based formulations. Quantitative analysis showed that 62.5% of the formulations were plant based, while the mineral based formulations had a high mean number of citations and versatile uses. Gastrointestinal (12.0%), *kapha* (11.3%) and dermatological (10.8%) ailments had a high percentage of citations. Jaundice had a high F_{ic} value (0.750) followed by the dermatological ailments. The illness categories with high F_{ic} values under each type of formulation were as follows: jaundice, aphrodisiac and urinary ailments (plant based); jaundice, cuts & wounds and dermatological ailments (mineral based); and hemorrhoids, *kapha* ailments and heart ailments (animal based formulations). The scientific studies conducted with important formulations under each illness category are discussed.

Conclusion: The present study indicated the importance of some illnesses over the others and inclusion of new illnesses under each formulation. The ingredients used to prepare these formulations have shown varying degrees of scientific evidence; generally limited studies were available on the efficacy of them as formulations. Further in-depth studies on the formulations with high IAR value and F_{ic} value of illness categories will be helpful to improve health status of the people.

1. Introduction

Siddha system of traditional medicine is being practiced majorly in Tamil Nadu and in places where the Tamil people live. Evidence has shown that from around 3rd century BC onwards the ancient *Tamils* had developed their own literature and had maritime relationships with other parts of the world (Gaur and Sundaresh, 2006). The names of some literatures belong to *sangam* period (300 BC–300 AD). *Thrikadugam*, *sirupanchamoolam* and *elathi* are some medicinal formulations that are still in use. Likewise, the 95th chapter of *thirukkural* (a Tamil classic) deals with principles of medicine and food. *Purananuru* (a Tamil classic) mentions about the antiaging effect of *Phyllanthus emblica*. The literatures used in contemporary *siddha* practices started from 4th–5th century AD and became predominant in 16th century;

Abbreviations: UR, Use reports; F_{ic}, Informant Consensus Factor; IAR, Informant Agreement Ratio; CRP, C-reactive protein; Rf, Rheumatoid factor; ESR, Erythrocyte sedimentation rate

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however the elements of healing practices emerged earlier (Zysk, 2008).

Siddha system of medicine shares some commonalities with *ayurveda* and delineation between these two systems is ambiguous (Weiss, 2008). Both the systems were generally denoted as *ayurvedam*; the term *siddha* had been introduced around 1923 (Sebastia, 2012). The healers of this system are viewed as practicing only an inferior form of *ayurveda* by the *ayurvedic* physicians (Weiss, 2009); sometimes it is misrepresented as spiritual or folk healing. The upsurge of Tamil movement in the mid-20th century positively affected in preserving and propagating this system of medicine (Sebastia, 2012).

The history of the *siddhars* of Tamil Nadu is nebulous; they dealt with diverse areas from medicine to social problems (Lal, 2001). The *siddha* literatures are found exclusively in Tamil in the form of poems and it might be the reason for their unfamiliarity and lack of rigorous research towards this system of medicine (Somasundaram, 2002). Efforts have been made to publish the *siddha* literature since the late-19th century; still a major portion remains as palm leaf manuscripts. About 800 original works of *siddha* literature related to medicine are available, of which only 160 have been published (Rajkumar et al., 2012). The later authors of this system collected effective formulations from various texts and published books along with their proprietary methods. All these literatures serve as the base for treatment and the formulations mentioned in these texts are known as the *sastric* formulations. Traditional Knowledge Digital Library founded by the Government of India has documented nearly 12,000 such formulations from various *siddha* literatures. The frequency and use-pattern of the *sastric* formulations generally differ. So far, no studies have analyzed the consensus on the usage of these formulations to the best of our knowledge. The present study documents and analyzes the traditional (*sastric*) formulations that are used by the non-institutionally trained *siddha* medical practitioners in Virudhunagar and Tirunelveli districts of Tamil Nadu.

2. Materials and methods

2.1. Data collection

Field surveys were conducted between July 2012 and March 2013 among the traditional practitioners of Virudhunagar and Tirunelveli districts of Tamil Nadu. These two districts were selected at random. Non-institutionally trained *siddha* medical practitioners were identified with the help of Virudhunagar and Tirunelveli district's *siddha vaidhiya sangam*. The term 'non-institutional training' refers to the training methods which are not recognized by the Government (i.e.) by traditional ways, but are recognized by hereditary transmission within the family from parents to children (*paramparai*) or from a master to a disciple (*gurukulam*) (Sebastia, 2012). The practitioners who had been practicing for more than two years were included in the survey. In the first visit, the purpose and nature of the project were explained to each practitioner in a simple language, to get prior informant consent. After establishing a clear consent from them, formal interviews were conducted from the second visit onwards. In this study, 115 traditional *siddha* medical practitioners were included and their knowledge on traditional *siddha* medicinal formulations was gathered. The interviews were conducted in the local language '*Tamil*' and the documentation of the data in the field was also done in the local language. Successive free listing was the method adopted for the interview (Heinrich et al., 2009). The interview consisted of two parts. The first part dealt with the demographic profile of the informants. The second part dealt with their knowledge on *sastric* formulations that have been used traditionally. The details regarding the ingredients, measures, mode of preparation, shelf life, illnesses treated, perceived adverse effects at recommended dose regimen, changes in diet and the *siddha* literature referred to prepare the formulations were recorded in this part. The data regarding the illnesses treated, dose, diet regimen, adjuvant, ingredients to prepare the formulations, measures of the ingredients and the mode of preparation were cross-verified with the literature, to assess the variations between healer's report and the literature.

2.2. Collection of samples

The samples of the ingredients used to prepare the formulations mentioned in this study were collected from the practitioners, identified and stored in Entomology Research Institute, Loyola College, Chennai. The plant samples were processed, identified and the names were confirmed with the help of regional floras (Gamble, 1997; Henry et al., 1987, 1989; Nair and Henry, 1983) and the valid names were provided by searching the web (http://www.theplantlist.org/). The binomial names of the animal samples were identified with the help of the Zoologist in this Institute. The mineral samples were also collected and the names of the mineral samples were given as mentioned in Indian Materia Medica (Nadkarni, 1996).

2.3. Analysis of the data

The data gathered in the field were translated into English in the laboratory. Then, the data were converted into use reports (UR). UR can be described as informant (i) mentioning the use of a species (s) for the treatment of a use (illness) category (u). The illnesses reported by the informants were grouped on the basis of their *emic* perceptions as mentioned in our previous publication (Chellappandian et al., 2012). The formulations were broadly classified into plant, mineral and animal based. The herbomineral formulations were also placed under mineral based formulations.

The consensus among the healers in treating an illness category with traditional *siddha* formulations was assessed by using informant consensus factor (F_{ic}). This factor can be given as

$$F_{ic} = N_{ur} – N_t / N_{ur} – 1$$

where N_{ur} is the number of use reports of informants for a particular illness category, and N_t is the number of formulations mentioned for particular illness by all informants. The importance of individual formulations was assessed by calculating Informant Agreement Ratio (IAR). IAR was calculated using the following formula:

$$\mathrm{IAR} = n_r – n_a / n_r - 1$$

where n_r is the total number of citations registered for a formulation and n_a is the number of illness categories that are treated with this formulation.

3. Results

The present study recorded the details regarding 194 traditional *siddha* formulations which have been used by the non-institutionally trained *siddha* medical practitioners of Virudhunagar and Tirunelveli districts of Tamil Nadu. The data regarding the illnesses treated, citations, dose, duration and referred *siddha* literature for preparing the formulations as mentioned by the informants are given as Supplementary data 1. The details regarding the ingredients and mode of preparing these formulations along with their variants are given as Supplementary data 2. The list of *siddha* literatures used to cross-verify the field data are