



INDIGENOUS FOOD FORMULATIONS OF KERALA USED IN MATERNAL CARE – AN EXPLORATORY STUDY

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ABSTRACT

In Kerala, herbal food formulations are widely used in maternal care, both pre- and post-childbirth. The present study was an attempt to understand the usage and nutritive value of these food formulations thereby documenting valuable traditional knowledge. Fifty young mothers and their elderly caretakers from Kollam district of Kerala were studied and it was observed that three extensively used food formulations of herbs *Morinda reticulata*, *Cocos nucifera inflorescence* and *Asparagus racemosus* were rich in energy, protein, fat, calcium, and vitamin C. Dietary pattern of young mothers revealed that the dietary intake of nutrients were inadequate when compared to Recommended Dietary Allowance suggested by Indian Council of Medical Research (2010). Consumption of the indigenous, nutrient-rich food formulations bridged the gap between the deficit in intake and the recommendations. Thus these traditional foods have nutritional value in addition to the functional benefits envisaged in *Ayurveda*.

KEY WORDS: Indigenous food formulations, traditional foods, maternal care, lactagogues



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INTRODUCTION

Traditional medicines are used by about 80% of world's population. In India, medicinal plants are widely used by all sectors of the population and it has been estimated that in total over 7500 species of plants are used by several ethnic communities¹. Use of plants as a source of medicine is an important component of health care system of India. The use of traditional medicines in developing countries is increasing². In the recent past, there have been several cases of bio-piracy of traditional remedies from India. An important criticism in this context is related to patents based on Indian biological materials without acknowledging the sources of their knowledge or sharing their benefits. Therefore it is imperative that there should be systematic documentation of Indian traditional knowledge. Quite a large segment of Indians still rely on traditional medicines and foods especially for mother and childcare, along with modern medical care. In Kerala, this diversified system of traditional practices has prevails among the rural communities since ancient time³. *Ayurveda*, an ancient science of life describes the use of herbs for postpartum care. In Kerala also indigenous plants and herbs have been traditionally used for making food formulations for postpartum care. An extra ordinary large population believes and relies on this rich knowledge. Therefore, an exploratory study was designed to find out usage, recipe composition and nutritive value of traditional indigenous food formulations, specifically used for maternal care in Kerala.

MATERIALS AND METHODS

A pilot study indicated that adherence to traditional maternal care practices was strong among natives of Kollam. Kollam or Quilon is a district in Kerala with a majority of population in suburbs. People still rely on *Ayurveda* as in many other rural areas of Kerala. Fifty young mothers who had infants between 0-4 months were selected by purposive sampling from the study area. A written consent was taken from the subjects, thus ensuring their participation in

the study and further publication. Having an elderly relative as caretaker, uniform geographical distribution throughout the study area and consent of the subjects for participating in the study were the criteria followed for selecting the subjects. Detailed personal interviews were conducted with these young mothers regarding the traditional and current maternal care practices, traditional lactogogue foods, views of subjects towards these practices etc. Dietary pattern of young mothers were assessed by 24-hour recall method and food frequency questionnaire. Recipes of most commonly used food formulations by subjects were standardized in lab by using the recipes prepared by carefully noting down the information given by the fifty elderly subjects and the main herbs used were analysed for their nutrient content. Energy (Bomb Calorimeter method), Protein (Microkjeldahl method), Calcium (Macro-method), Iron (Colorimetry), Phosphorus (Colorimetry), Vitamin C (Dye reduction method), Total carotene (Spectrophotometry) Sodium (Flame photometry) and Potassium (Flame photometry) were the techniques of nutrient analysis. Using these results, nutritive value of each formulation was computed and its contribution towards the RDA was also found out.

RESULTS AND DISCUSSIONS

(i) Traditional and current maternal care practices

The general characteristics of the population indicated that 68% of the population studied were Hindus. Forty two percentage of the subjects received postpartum care in joint families. Mean age of mothers was 27 years, while of elderly caretakers was 51 years. Recall of elderly caretakers regarding postpartum care formulations indicated that they had used on an average of 14 food formulations (mean 33yrs back). However, only 9 formulations, on an average, were used by the young mothers at present. The decrease in the number of food

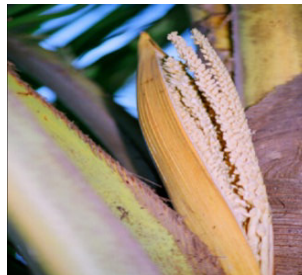
formulations used in postpartum care was either due to unavailability of herbs or lack of interest among the present generation. Pookkula (*Cocos nucifera* inflorescence), Neyvally (*Morinda reticulata*) and Sathavari (*Asparagus racemosus*) were the most commonly used herbs. The foods, believed to be potent lactogogues by the elderly care takers were

coconut milk, fenugreek gruel, cow's milk, crab, jack fruit, drumstick leaves, plantain and oats. Young mothers followed special care practices during pregnancy, which include nutritional supplements, tonics or medicines and exercise. They also believed that *Ayurvedic* medicines and food formulations should be used only after delivery.

Most commonly used herbs for maternal care



Neyvally
(*Morinda reticulata*)
Figure 1



Pookkula
(*Cocos nucifera* inflorescence)
Figure 2



Sathavari
(*Asparagus racemosus*)
Figure 3

Most commonly used eight food formulations



Figure 4



Figure 5

(ii) Views regarding maternal care practices

All subjects believed that food formulations were used for general health and well-being. According to 20% of the subjects, herbs like Sathavari (*Asparagus racemosus*) help in uterus contraction, after delivery. Similar observations were found in a study conducted in Parbhani district of Maharashtra. A high percentage of women in urban and rural areas of Parbhani were found to consume special foods during lactation. The most common

reasons for doing so were to aid digestion, to improve body strength and to increase milk production⁴. A study among *Paniya* tribes of Kerala also reported the usage of 32 plant species from 30 genera belongs to 25 families for gynaecological problems⁵. Majority of young mothers and their elderly caretakers believed that special maternal care practices were very important and essential. But 36% of young mothers had no particular opinion regarding maternal care practices. This indicates a

changing trend in the adoption of traditional maternal care practices as the younger generation may not be able to spare time and resources needed for the same.

(iii) Dietary pattern of young mothers

Majority of young mothers (88%) were non-vegetarians and had almost six meals per day. The six-meal pattern, as found by the 24-hour recall was a split up of 4 main meals (breakfast, lunch, a heavy evening meal and dinner) and two small snack times. Highly nutritious items like Ragi, Soya bean, Chekkurmanis (*Sauropus androgynus*) were not at all taken by majority of the subjects. Among fruits, apple, orange, grapes and mangoes were consumed frequently. Among green leafy vegetables,

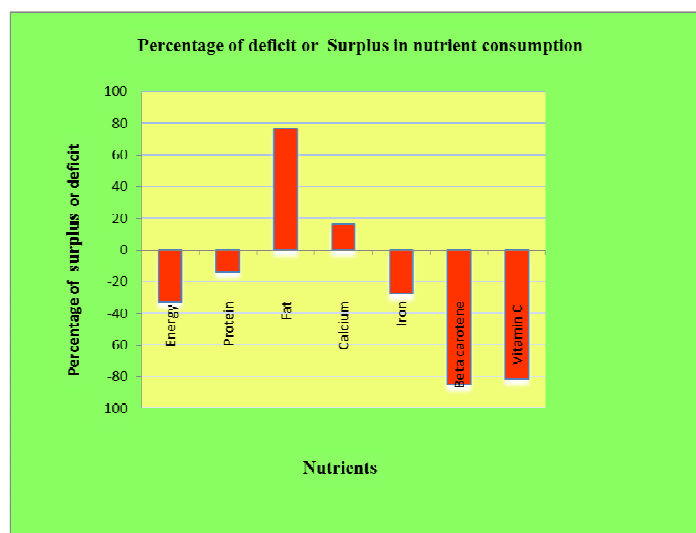
cabbage and amaranth were used but costly items like mutton, cheese, paneer etc. were less frequently used. 24-hour dietary recall survey revealed that consumption of green leafy vegetables was remarkably low. But milk and milk product consumption was near to the RDA level. This result is similar to a study conducted in Ludhiana district⁶. The daily diets of lactating women in rural and urban areas in Parbhani district had adequate amounts of vegetables, milk, milk products, fats and oils³. Intake of energy (-32.8%), protein (-13.9%), iron (-28%) beta-carotene (-85.2%) and vitamin C (-81.25) were inadequate (Table 1). Earlier studies on pregnant and lactating women from the country have documented similar results^(7,8).

Table 1
Nutrient consumption of young mothers

Nutrients	Actual intake (N = 50)	Recommended Dietary allowance*	Percentage of deficit or surplus
Energy (Kcal)	1680	2500	-32.8
Protein (gm)	67	77.9	-13.9
Fat (gm)	53	30	+76.6
Calcium (mg)	1400	1200	+16.6
Iron (mg)	18	25	-28
Beta carotene (mcg)	1127	7600	-85.2
Vitamin C (mg)	15	80	-81.25

*RDA for lactating mothers, ICMR, 2010⁹

Graph 1
Pattern of nutrient consumption of young mothers



(iv) Nutrient analysis of selected herbs

Neyvalli (*Morinda reticulata*), Pookkula (*Cocos nucifera* inflorescence) and Sathaveri (*Asparagus racemosus*) were the most commonly used herbs for maternal care. A study conducted in South

Kerala also showed frequent use of eight different medicinal plants including *Cocos nucifera* and *Asparagus racemosus* for maternal care¹. Nutrient analysis revealed that Neyvalli (*Morinda reticulata*) was found to be high in calcium, iron, phosphorus, vitamin C and Total carotene. Sathavary (*Asparagus racemosus*) was a rich source of energy, vitamin C and phosphorus and pookkula (*Cocos nucifera* inflorescence) was rich in calcium and vitamin C (Table 2).

Table 2
Nutrient content of selected herbs

Nutrients (Per 100 gm)	Name of herbs		
	Neyvally (<i>Morinda reticulata</i>)	Pokkula (<i>Cocos nucifera</i> inflorescence)	Sathavari (<i>Asparagus racemosus</i>)
Energy (Kcal)	24.55	51.46	127.74
Protein (gm)	17.5	7	7
Calcium (mg)	832.6	305.7	295.12
Iron (mg)	13	2	2
Phosphorus (mg)	440	50	440
Vitamin C (mg)	375.6	210.39	120.2
Total carotene(mcg)	37326.08	-	-
Sodium (mg)	38	20	36
Potassium(mg)	80	80	80

According to Bharathi (2004), there are many edible plant varieties, notably unconventional green leafy vegetables grown in fields among other crops which are highly nutritious. These foods help to increase the nutrient density at low cost also¹⁰. Neyvally(*Morinda reticulata*) being rich in essential nutrients holds promise in this respect. Observations suggest that the leaves of *Morinda citrifolia* could be used to treat local vitamin A deficiency in the South Pacific¹¹.

(v) Standardisation of recipes and consumption of nutritive value of food formulations

Recipes of special formulations as reported by elderly caretakers were standardized and nutritive value of food formulations were computed (Table 3). All the preparations were nutrient dense. Nellikka arishtam (gooseberry wine with jaggery) had very high amounts of vitamin C (600mg). Neyvally kurukku (Thick porridge), Sathavary gulam (Thick porridge), Ulli lehyam and pookkula kurukku (Thick porridge) were energy dense. It was observed that the intake of one serving of one of the formulation, Neyvallikurukku (Thick porridge) in addition to the normal diet, considerably increased the nutrient intake of young mothers (Table 4).

Table 3
Nutritive Value of the most commonly used traditional food formulations

Name of formulation	Energy (kcal)	Protein (gm)	Fat (gm)	Calcium (mg)	Iron (mg)	Phosphorus (mg)	Vitamin C (mg)
Neyvallikurukku (Thick porridge) [□]	912	24.4	26.175	1123.91	14.2	640	376.1
PokkulaKurukku (Thick porridge) [□]	939	13.9	26.17	596.91	3.2	700	210.89
Pookkulaputtu [*]	26	3.5	10.65	160.33	1.78	390	105.44
Pookkulakozhukkatta [□]	437	10.97	6.74	164.33	1.95	446	105.34
Sathavarigulam (Thick porridge) [□]	1015	13.9	21.17	586.37	3.2	640	120.7
Ullehyam (Thick porridge) [□]	870	8.26	27.32	424.25	3.35	259.85	0.74
Nellikaiarishtam (Gooseberry brew) [□]	417	1.5	0.2	50	1.2	20	600
AttinBrath (Mutton soup) [□]	109	9.61	6.67	83	2.45	75.24	0.4

□ One cup

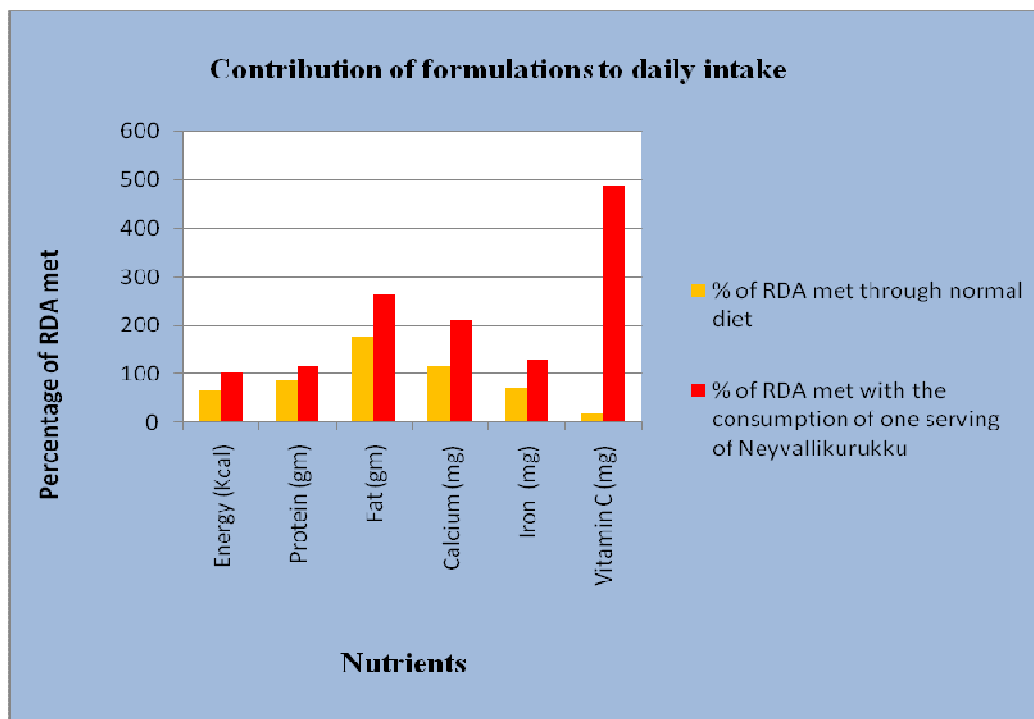
◆ One mould

All the food formulations studied have nutrient rich items added like palm jaggery, ghee, coconut milk, rice flour, herbs etc and the method of preparation was in such a way that a concentrated nutrient-dense food product is obtained. Table 4 illustrates the hike in nutrient consumption obtained from a serving of Neyvallikurukku (Thick porridge of *Morinda reticulata*).

Table 4
Contribution of formulations to daily intake

Nutrients	% of RDA met through diet of mothers	% of RDA met with the consumption of one serving of Neyvallikurukku
Energy (Kcal)	67.2	103.68
Protein (gm)	86.00	117.32
Fat (gm)	176.6	263.9
Calcium (mg)	116.6	210.3
Iron (mg)	72	128.8
Vitamin C (mg)	18.75	488.9

Graph 2
Contribution of formulations to daily intake



CONCLUSION

As the maternal care practices based on indigenous food formulation has been prevalent in Kerala, the nutrient contribution of the same gains importance. Fifty young mothers and their elderly caretakers were the subjects of the detailed study. Details regarding the traditional and current maternal care practices, lactagogue foods, views of subjects towards these practices

and dietary pattern of the subjects were collected using detailed personal interviews with them. Neyvalli (*Morinda reticulata*), Pookkula (*Cocos nucifera inflorescence*), Sathavari (*Asparagus racemosus*) were the three most commonly used herbs by both elderly and young mothers. Coconut milk, fenugreek gruel, cow's milk, crab, jack fruit, drumstick leaves,

plantain and oats were the potent lactogogues believed by the subjects. When compared to 14 food formulations reported to have been used by elderly caretakers (mean 33yrs back), only 9 formulations were used by the young mothers at present. The decrease in the number of food formulations used in postpartum care is either due to unavailability of herbs or lack of interest among the present generation. However, both young mothers and their elderly caretakers believed that traditional, Ayurvedic maternal

care practices were very important for health maintenance. Dietary assessment revealed that the intake of energy, protein, iron, Beta-carotene and vitamin C were inadequate. Herbs and the food formulations studied were nutrient rich, so indigenous herbal preparations found in the present investigation in modified forms may have scope for supplementation during other vulnerable periods like pregnancy, adolescence etc. thereby bridging the gap of under nutrition.

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