

## ROLE OF BALAVILWA MAJJADI MODAKA GRANULES AS NUTRACEUTICAL IN THE GROWTH AND DEVELOPMENT OF INFANTS – A RANDOMIZED CONTROLLED TRIAL

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Received: 11 February 2023, Revised and Accepted: 17 April 2023

### ABSTRACT

**Objective:** Even though the formulation is classically mentioned and the ingredients of the formulation are easily available, it is not commonly used and its efficacy as a weaning food is not evaluated using present clinical parameters. By this study, an attempt is made to develop a user-friendly nutraceutical formulation as a weaning food for infants and find the efficacy in the growth and development of infants.

**Methodology:** Preliminary physicochemical analysis and nutritional analysis of the formulation were done. For the clinical study, 30 participants were selected, 15 for the study group and 15 for the control group. Both groups were given a designed diet chart. Apart from that, the study group was given the formulation.

**Results:** From the nutritional study, it was found that the formulation Balavilwamajjadi granule is providing reasonable number of calories as a formulation for infants. It contains some important micronutrient too. Balavilwa majjadi granules have an effect on the enhancement of growth and development of infant's under-recognized stage of complementary feeding. A significant effect is constrained to weight and length.

**Conclusion:** Administration of Balavilwamajjadi granule along with dietary patterns will help to reduce conditions like reduction in appetite, and loose stools associated with complementary feeding. It is of no doubt that different combinations said in Ayurvedic classics have got great potential in the prevention and cure of diseases and is an unexplored area to conduct researches related to Nutraceuticals.

**Keywords:** Nutraceuticals, Nutrition, Infants, Growth and development, *Balavilwamajjadi modaka*.

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### INTRODUCTION

Every human being is the creator of his own health or disease. Health is a precious possession, wisdom, and art. Good nutrition is the fundamental basic requirement for positive health, functional efficiency, and productivity. Nutrition science provides abundant evidence for the importance of nutrition not only in promoting proper physical growth and development but also in ensuring adequate immune competence and cognitive development.

The ancient Acharyas who described Ayurveda as "science of life" had in-depth knowledge and understanding about the delicate relationship between food, nutrition, and health. They had realized the fact that food can be used as medicine. While describing treatments for various ailments, they have pointed the role of diet regimen for curing/preventing that particular disease. The chapter "*Apamarga thanduleeyam*" in *Charaka Samhitha Sutrastanam* deals with different types of gruels indicated for various ailments. The modalities to revitalize and rejuvenate the human body and mind, known as *Rasayana Chikitsa*, are specifically adopted to increase the power of resistance to disease and improve the general vitality and efficiency of the human being. *Pathya Kalpana* is a vast area dealing with different types of food preparation having tremendous healing properties. Acharya *Kasyapa* said that "the food is said to be cause of stability for all living beings and quotes that there is no medicament similar to diet. One is capable to be disease-free only with a congenial diet. It is not possible to sustain life without diet even if endowed with medicine. That is why the diet is said to be the greatest medicament by physician" [1].

This judicious thinking is now accepted worldwide and emerging as a new area of scientific interest Nutraceuticals. This is mainly due to the increasing realization of the scientific fact that most of the diseases of mankind today are due to lifestyle changes, particularly in the change

of food and diet. Furthermore, there is a growing faith that natural products particularly plant-derived products are safer than modern synthetic drugs. The term nutraceutical was coined by Stephen de Felice in 1989 from the words nutrition and pharmaceuticals. It is defined as a food or part of a food that provides medical or health benefits including the prevention and treatment of diseases [2].

The nutritional needs of a child should be met from the time of birth through the phase of breast feeding and supplementary foods. In fact, infant feeding is the matter of great concern in the field of nutrition since malnutrition of early childhood has long-term serious consequences as it impedes motor, sensory, cognitive, social, and environmental development. The concept of nutraceuticals is now widely discussed in the concerned area of child nutrition and it is one of the fastest-growing segments of the food industry, especially among affluent baby boomers.

Early weaning due to different causes is becoming a serious issue in our society. Introduction of a complimentary food in a time of transition when the child becomes used to eating semi-solid foods will be beneficial. An ideal complementary food should be easily available, palatable, and cost-effective. Nutritive value of the food should meet the requirement of a growing infant. Conventionally and culturally acceptable and locally available weaning food is preferred.

The research programs in *Bhaishajya Kalpana* - Ayurvedic Pharmaceutical Science include preparation of good quality medicines which are user friendly. Different combinations said in Ayurvedic classics have got great potential in the prevention and cure of diseases and is an unexplored area to conduct researches related to nutraceuticals. The details about different complementary foods have been mentioned in the chapter of *Bālopacharaneeyam*, in *Ashtanga Hrudaya Utharastana*. The formulation named *Bālavilwa majjadi*

*modaka* is described as a complementary food for weaning and *deepana* (digestive) in action [3]. Even though the formulation is classically mentioned and the ingredients of the formulation are easily available, it is not commonly used and its efficacy as a weaning food is not evaluated using present clinical parameters. Furthermore, the organoleptic character of the formulation has got much importance as it affects the intake of complementary food by the growing child. By this study, an attempt is made to develop a user-friendly nutraceutical formulation as a weaning food for infants and find the efficacy in the growth and development of infants.

#### Aim and objectives

The present clinical trial was carried out with the following aims and objectives.

To develop a nutraceutical formulation effective in the growth and development of infants.

Evaluate the efficacy of the formulation in the growth and development of infants.

#### Pharmaceutical study

##### Preparation of *Bālāvilwamajjadi granules*

Even though the dosage form was *modaka* [4], it was prepared in granule form for this study. One reason behind this was to make the dosage form more presentable. Since it is a food formulation, the shape and size of *gutika* like preparation are unsuitable and impractical because of the size or number required per dose. Moreover, easiness in packing, storage, and dispensing of granules compared to other dosage forms and different modes of administration make the granular dosage form more users friendly.

Dried pulp of *Vilwaphala*, *Laja* (puffed rice), was searched for impurities and cleaned thoroughly. *Laja*, *vilwamajja*, and seeds of *Ela* were finely powdered and homogenously mixed. Sugar candy was taken instead of sugar as it has properties such as *balya* and *brumhana* and frequently used in pediatric formulations traditionally than the later. Proportion of ingredients is not mentioned for the formulation in the classical reference. *Laja*, *Vilwa*, and *Ela* were taken in the ratio 4:2:1. Four times of sugar candy were taken in relation to *churna* as the general rule. Sugar candy was completely dissolved in required quantity of water. It was filtered using a cloth to remove the impurities, if any.

The filtrate was taken in a clean vessel and heated over *mandhagni*, continuously stirred while heating. After reaching the proper *paka* (for getting the consistency of granules, *paka* should be just above the *leha paka*), vessel was removed from fire. Powdered drugs were added into this and mixed well. After attaining the consistency of dough, it was pressed down through a suitable sieve of number 10 superimposed on the number 22. The granules were dried by spreading and keeping them in hot air oven at a temperature not exceeding 60°C. Organoleptic features of two samples viz Sample 1 (Raw) – Raw drugs without sugar and Sample 2 (B V Granules) – *Bālāvilwamajjadi granules* were noted (Table 1).

#### Dose

No specific dose is mentioned in the text. Since it is a food formulation, it has to be taken according to the digestive power of the child [5]. Digestive power is depended upon age of individuals. A trial dose of 30 g once daily was taken and fixed later.

#### Analytical study

After the preparation of the formulation, two samples were analyzed in the laboratory [6]. The samples evaluated in this study were Sample 1 (Raw) – Raw drugs without sugar and Sample 2 (B V Granules) – *Bālāvilwamajjadi granules* (Table 2).

Qualitative analysis shows that the samples contain alkaloids, phenolics, and flavonoids. Both samples contain high amount of flavonoids.

Qualitative analysis of sample 2 for alkaloids showed more positive results denoting the presence of alkaloids in other ingredients [7].

The TLC results indicate the presence of almost all the constituents of sample 1 in sample 2. Solvent system 1 – acetone, chloroform, and benzene (4:4:1) showed more spots than solvent system 2 – toluene and ether saturated with 10% acetic acid (1:1)

#### Bulk density, void porosity, and angle of repose

Bulk density is defined as the mass of the granule/powder divided by the bulk volume. Porosity is the total space present in a collection of powder/granules [8]. Void porosity of granule is 54.3%. The value of void porosity denotes that the granule has got a good disintegration and dissolution rate. It is also having good flow properties. Angle of repose is the maximum angle possible between the surface of the pile of powder/granule and the horizontal plane which determines the flow properties of granules. The angle of repose of *Bālāvilwamajjadi granules* is 31° 24' which denotes a good, reasonable flow property.

#### Nutritional study

Nutritional studies of the formulation were carried out at the National Institute for Interdisciplinary Science and Technology, Council of Scientific & Industrial Research, Thiruvananthapuram. The supply of calories by different macronutrients was found to be reasonable for infants when compared to the RDA (Table 3).

#### METHODS

##### Study design

The study design was a randomized controlled trial. The participants were selected as per inclusion and exclusion criteria and randomized into study and control group by simple random sampling. A total of 30 participants were selected, 15 for the study group and 15 for the control group. Both the study and control groups were given a designed

Table 1: Organoleptic characters of analytical samples

Character	Raw drugs without sugar	B V Granules
Color	Light yellowish	Creamy
Odor	Pleasant	Pleasant
Touch	Smooth	Hard
Taste	Bitter, pungent	Sweet
Consistency	Powdery	Granular

B V Granules: *Bālāvilwamajjadi Granules*

Table 2: Details of analytical specifications

Specifications	Raw drugs without sugar	B V Granules
pH	6.6	6.8
Loss on drying	10.6%	3.70%
Total ash	3.64%	0.65%
Water-soluble ash	1.82 %	0.3%
Acid-insoluble ash	0.45%	0.1% (negligible)
Cold water extractive	34.26%	84.6%
Alcohol soluble extractive	5.72%	5.18%

B V Granules: *Bālāvilwamajjadi Granules*

Table 3: Details of nutritional analysis

Nutrient	In 100 g of BV granules
Protein (%)	10.2
Fat (%)	3.3
Carbohydrate (%)	77.77
Total caloric value	381.58 Cal
Sodium (%)	0.11
Potassium (%)	0.31
Calcium (%)	0.08

B V Granules: *Bālāvilwamajjadi Granules*

diet chart. Apart from that, the study group was given the formulation. A detailed clinical examination was conducted before and after the study using a prepared clinical pro forma. The effect of the formulation was assessed by evaluating the signs and symptoms.

#### Study setting and population

The study was carried out in the immunization cell, Women and Children Hospital, Poojappura. Participants were selected from infants, irrespective of sex, caste, religion, and economic status, between the ages of 6–12 months.

#### Inclusion criteria

The following criteria were included in the study:

1. Children who had started weaning
2. Maximum age limit will be up to 12 months.

#### Exclusion criteria

The following criteria were excluded from the study:

1. Children of age below 6 months and above 12 months
2. Nutritional deficiencies associated with pathological conditions
3. Children with congenital anomalies.

#### Intervention schedule

Two groups were made identical in all aspects except for the intervention 30 g of *Bālāvilwamajjadi* granules were given once daily along with a required quantity of milk to mix the granules for a continuous period of 60 days for the study group. Milk was given since it is congenial to children. Both the study and control groups were given a designed diet chart and were subjected to intervention for a continuous period of 2 months.

#### Variables

In this study, the study drug, *Bālāvilwamajjadi* granule, was the independent or experimental variable. Growth and development along with morbidity were taken as dependent variable. Diet and activities of the child, medication and illness of both mother and child, different types of infections, environmental variations, poor hygiene, etc., are coming under intervening variables.

#### Follow-up

Interventional schedules were advised for both the study and control groups and advised to attend the O.P. at regular intervals to measure the morbidity if any, including weaning difficulties. It was advised to report any changes in the normal habits of the children immediately. A specific data sheet of the reports for each participant was kept for the assessment of morbidity. Detailed evaluations were done before and after the intervention after 2 months for each participant.

#### Collection of data

The data were collected using prepared clinical pro forma. Demographic data of the participants and data related to intervention were collected as per the protocol.

#### Assessment criteria

Assessment of both study and control groups was done before and after the study using relevant measures that are internationally accepted.

1. Measurement of morbidity-ill health which occurred with the child was recorded using the parameters of morbidity indices such as incident rate and prevalence rate.
2. Nutritional anthropometry includes length/height, weight, calf circumference (CC), mid-upper arm circumference (MUAC), and body mass index.
3. Trivandrum developmental screening chart.

## RESULTS AND DISCUSSION

$p^H$  of sample 1 is 6.6 and that of sample 2 is 6.8. On comparing the  $p^H$ , both show almost the same with sample 1 slightly toward acidic  $p^H$ . The moisture content of sample 1 is 10.6% and that of sample 2 is 3.70%. Sample 1 was air-dried. Sample 2 was oven-dried after the preparation

and hence shows less moisture content. The total ash of raw drugs and finished product are 3.64% and 0.65%, respectively. Ash value normally designates the presence of inorganic salts found naturally in the drug, as well as inorganic matter derived from external sources. Both contain a very small number of inorganic parts or external impurities. Sample 2 contains sugar as a major ingredient, four times of sample 1 and is burnt off during ignition. The values of both samples justify the percentage of ingredients in the samples. Water-soluble ash of sample 1 and sample 2 is 1.82% and 0.3%, respectively. Acid-insoluble ash of sample 1 and sample 2 is 0.45% and 0.1%, respectively. Both the values justify the percentage of ingredients in the samples.

Cold water extractive of raw drug is 34.26% and that of finished product is 84.6% which is very high because of a high percentage of sugar. Alcohol-soluble extractive of a raw drug is 5.72% and that of finished product is 5.18%. However, it could have been a higher value in the case of sample 2 when the procedure is carried out using 95% ethanol.

The sociodemographic data are having high significance in a nutritional study. On analysis, it was found that out of the total 30 participants, 80% were urban dwellers. 53% are coming from the middle-class family in which the medium and lower middle class covers more. No one from a high-class family attended the study. About 47% fall in the poor category. As far as educational statuses of the parents are concerned, 60% had attended only school and fall in poorly educated group. The remaining 40% fall in the moderately educated group. The low educational status of parents may adversely affect infant nutrition because they are not well aware about the importance of proper weaning and improved weaning practices. Artificial feeding requires a significant expenditure and is a burden on low-income group and poor families. Poor economic status thus indicates less resources and poor nutritional adequacy.

About 43.3% of participants were started weaning before the age of 4 months, which is much earlier than the time recommended by the WHO. About 16.7 % started weaning at the age of 5 months and 30% started at 6 months. Only 10% were exclusively breastfed their baby up to 6 months. Replacing breast milk early in infancy makes the child's nutritional needs difficult. There is no caloric advantage for complementary food than breast milk when weaning happens at 4 or 5 months instead of 6 months.

About 46.6% started complementary feeding with any one of the tin foods as a custom now due to the present way of life, which was not seemed to be a good practice when it compares with traditionally and culturally acceptable weaning food. Remaining 53.4% were started with other traditionally used items such as ragi and banana. Even though tinned foods were not used by this group as the first feed, they included it during the later stages of complementary feeding. These observations further highlight the importance of proper guidelines to the parents about different healthy weaning practices. An attempt was made to educate the parents about present and highly acceptable feeding practices during the course of study.

About 74% of participants were taking mixed diet during complementary feeding. In a balanced form, mixed dietary practices provide a rich source of amino acids and proteins from non-vegetarian food which is not abundant in vegetables. The digestive capacity of infants is not stabilized during the period of transition from breastfeeding to complementary feeding. Hence, meticulous care is to be adopted while choosing non-vegetarian food. About 16.7% were suffered underweight at birth and 80% of the infants had an optimal birth weight that is having its own effect in the baby's growth potential in the later years.

After the interventional period of 2 months, the efficacy of the intervention was assessed using nutritional anthropometric measures such as, length/height, weight, hip circumference (HC), CC, and MUAC. BMI is not taken as a parameter as it is reliable only after 2 years of age. The study was conducted in an established weaning group. On analyzing the parameters of growth, length and weight of the participants of

the study group have shown statistically significant differences when compared to control group in which the participants have received dietary advices alone. An increase in weight was seen both in the study group and control group to be statistically highly significant with t-value of 29 and  $p < 0.001$  and with t-value of 11.311 and  $p < 0.001$ , respectively. The study drug was significantly effective than the control drug in increasing the weight of the child ("p" value is  $< 0.001$ ). An increase in length was seen both in the study group and control group to be statistically highly significant with t-value of 11.167 and  $p < 0.001$  and with t-value of 7.302 and  $p < 0.001$ , respectively. The study drug was significantly effective than the control drug in increasing the length of the child ("p" value is  $< 0.05$ )

Study group has received *Bālāvilwamajjadi* granules along with a diet chart. As far as other parameters such as HC, CC, and MUAC are concerned, none of the parameters in the study group showed statistically significant difference when compared to the control group even though there were improvements within the groups. The mean difference in chest circumference of the child before and after intervention in the study group was 1.1 and for the control group, it was 1.0933. Here, "t" value is 0.063 and "p" value is 0.95. This shows that the study was statistically not significant.

The mean difference in head circumference of the child before and after intervention in study group was 0.64 and for the control group, it was 0.6467. Here "t" value is 0.154 and "p" value is 0.879. This shows that the study was statistically not significant. Mean difference in MUAC of the child before and after intervention in the study group was 0.3067 and for the control group, it was 0.3333. Here "t" value is 0.754 and "p" value is 0.457. This shows that the study was statistically not significant ("p" values 0.879, 0.95, and 0.457, respectively).

Length and weight are very sensitive parameters compared to other anthropometric parameters which are evident from the current study. The other parameters are not so sensitive but are good indicators of nutritional status during fetal life and in early infancy. The growth improvement could have been better if the nutritional formulation is administered in early infancy since growth is rapid and evident during that period.

The effect of granule along with prescribed diet schedule was assessed using approved TDS chart for assessing developmental milestones. Only children having normal developmental pattern for the age were assigned to the study. After the completion of the intervention, it was found that all the children in both groups had reached the developmental milestones in time and had no significant difference between the study and control group.

Assessments of morbidity conditions during the time of intervention were monitored. Constipation, loose stools, regurgitation, recurrent respiratory infections, and reduced appetite were the noted conditions. During the intervention, six participants of the control group complained about a reduction in appetite while only one complained in the study group. This may be due to the *deepana* action of the study drug that results in the increased digestive power. During the study period, four participants in the control group showed loose stools while none in the study group. Constipation was developed in two participants of the study group and in four participants in the control group. Recurrent respiratory tract infection was a concern during the period of intervention. Five participants in the control group and four participants in the study group showed symptoms of common cold and fever.

No adverse drug reactions were noticed by the formulation during the course of study.

#### Probable mode of action

*Bālāvilwamajjadi modaka* is a formulation described in *Ashtanga Hrudhaya Utharasthana* in the chapter of *bālopacharaneeyam*. The

combination is indicated for complementary feeding and is *deepana* (digestive in action). It contains four ingredients, *Phala majja of Bāla vilva* (unripened fruit pulp of *Vilwa*), *Ela*, *Sarkara* (Sugar), and *Laja sakhthu* (puffed rice powder). Sugar candy was taken instead of sugar because as per Ayurvedic literature, it has got the qualities such as *Brimhana* (stoutness the body) and *Balya* (bestows strength), the two main properties that should be needed for the proper growth and development in infants. On analytical studies, both have got almost similar properties. Due to the above-mentioned properties, the former is frequently used in pediatric formulations traditionally than the later.

The digestive capacity of the child is not fully developed at the time of exclusive breastfeeding. The *kshirapa* has equilibrium of *agni* which becomes unstable when *annaprasana* is initiated. It is important to start weaning with a suitable formulation when child becomes used to eating semisolid foods. The *deepana* action of this formulation helps to strengthen and stabilize the digestive fire.

*Deepana* action of formulation can be described in terms of individual properties of its ingredients. *Vilwaphala* is having *katu tiktha kashaya* rasa [9]. *Katurasa* has got *deepana*, *pachana*, and *ruchya* properties. *Tiktharasa* is *deepana*, *pachana*, *ruchya*, and *medhya*. *Deepana* and *pachana* action of *vilwaphala* helps to strengthen and stabilize the digestive fire. In terms of action on different doshas, *vilwaphala* is *vatakaphahara* and *pithakrith*. *Pithakara* properties help in *agnideepana*. Apart from this, *laghu rukshaguna*, *ushna veerya*, and *katu vipaka* are also contributing to the *agnideepana* action. *Ela* is *anulomana* and *deepana*. *Anulomana* of *vata* causes proper functioning of *agni*.

Strengthening of *jadaragni* exerts its effect on different *dhatwagnis*. It helps in the proper digestion and assimilation of dhatus right from *rasadhatu* to *sukladhahu*. The properly maintained *agni* will hinders the production of *ama* which in turn causes proper functioning of *srothases* and ultimately ends in effective *dhatu parinama*. All these contribute to the proper growth and development of growing infants.

The formulation is having direct effect on the growth and development of children due to its inherent properties. Out of the four ingredients, three are having *madhura* rasa. On analyzing *veerya*, three drugs possess *seetha veerya*. Three out of four drugs are *laghu*. Two drugs, *laja* and *khanda sitha*, which covers the good proportion of formulation are *snigdha* and *brumhana*. Three drugs are having *Madhura* rasa, *seetha veerya*, *madhura vipaka*, and *snigdha guna* that factors contributing to *bhrumhana* karma. The formulation has got dominance of *madhura* rasa which is *mamsa medha asthi vardhana*, *Ayushya*, *indriya prasadhana*, *balavarnakara*, *preenana*, *jeevana*, *tarpana*, *brumhana*, and *sthairyakara* due to its *sareerastmyathwa*. All these above factors help in the proper growth and development of infants.

Acharya *kasyapa* says that diet given to the child for growth and development should be *madhura*, *snigdha*, *laghu*, *seetha*, and *hitha*. Analysis of this formulation as a weaning food justifies the statement of Acharya.

Unripe *Bilwa phala* cures colic arising from *kapha vatha* and *ama* which may have a positive effect in curing one of the weaning dilemmas intestinal colic. *Vilwaphala* is *grahi* in nature. Feedback from the participants shows that formulation is not causing constipation in children. This might have happened as the *Sara guna* of *khanda sita* neutralizes *grahi* guna thereby stabilize the gastrointestinal tract.

Apart from the therapeutical properties, *ela* gives flavor and aroma to the formulation which affects the intake of complementary foods by the infants. Adding sugar with a higher sweetness index will increase consumption which was satisfied by adding *khandasitha*.

*Laja* (puffed rice) is *laghu* that makes it easily digestible and assimilable. The presence of *laja* reduces the heaviness of the formulation and provides a suitable environment for the proper digestion of the formulation. It



is nutritionally effective with enough micro and macronutrients and contains trace amount of fat. Gluten-free nature of this formulation helps for easy digestion. Apart from this, it is the drug of choice for *chardi* (vomiting); hence, addition of *laja* in the formulation will reduce two major conditions associated with weaning-vomiting and regurgitation.

#### **Bālavilwa majjadi granules as a nutraceutical**

A food or part of food that provides medical and health benefits including prevention and treatment of disease is known as a nutraceutical. It is a nutritional formulation with pharmaceutical information.

*Bāla vilwa majjadi modka* is a complementary food that is given during the time of weaning. It is *deepana* in action. The *ksheerapa* has equilibrium of *agni* which became unstable while *annaprasana* is started. This may cause various dilemmas associated with weaning including constipation, loose stools, and loss of appetite. The *deepana* action of the formulation stabilizes the gastrointestinal tract, thereby overcome the above said problems and this is evident from the study. Recent studies suggest that the constituents present in *Vilwa*, namely marmelosin and furocoumarin have potent digestive and anti-diarrheal action. The fruit pulp is very effective in diarrhea and dysentery. It is stomachic and is good in dyspepsia. It contains a high amount of coumarins, steroids, and flavanoids. From the nutritional study, the formulation *Bālavilwamajjadi* granules provide reasonable calories from carbohydrate, fats, and proteins. It also contains traces of micronutrients. Thus, *Bālavilwa majjadi* granules can be included in the category of traditional nutraceuticals that are simple, natural whole food with newer information about their potential health benefits.

#### **CONCLUSION**

Infant feeding is the matter of great concern in the field of nutrition since malnutrition of early childhood has long-term serious consequences as it impedes motor, sensory, cognitive, social, and environmental development. Inadequate knowledge about proper weaning practices, non-availability of cost-effective formulations, low nutrient density and poor quality of the foods, and low family income are some major factors that hinder proper and timely complementary feeding. Proper maintenance of *Agni* plays a major role in the health of the infants. It is more relevant during complimentary feeding – a time of transition when the child becomes used to eating semi-solid foods. *Bālavilwamajjadi* granules have effect on the enhancement of growth and development of infants under the established stage of complementary feeding. A significant effect is constrained to weight and length. *Bālavilwamajjadi* granule has got *madhurarasa*, *laghu*

*snigdha guna*, *seeta veerya*, *madhura vipaka*, and *balyakara* and *brumhana swabhava* which make the formulation suitable for growth and development. Administration of the formulation along with dietary patterns will help to reduce conditions such as reduction in appetite and loose stools associated with complementary feeding. Modification of formulation into granules made it more presentable, palatable, and user friendly. Preliminary nutritional analysis shows that the formulation is having reasonable caloric value with the presence of major micronutrients. It is no doubt that different combinations said in *Ayurvedic* classics have got great potential in the prevention and cure of diseases and are an unexplored area to conduct researches related to nutraceuticals.

#### **ACKNOWLEDGMENTS**

None.

#### **CONFLICTS OF INTERESTS**

Nil.

#### **AUTHORS FUNDING**

Nil.

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