

Original Research Article

A Foundation for Development of Ayurveda Dietary code of conduct Questionnaire w.r.t its impact on dietary assessment of Healthy and Diseased individual.

Comment [IT1]: Type in full, do not use abbreviation

Abstract:

Comment [IT2]: Bring out the introduction clearly, the gap in existing knowledge(problem) the main purpose of the research, objectives, (Methodology)study procedures, Analysis?, (Content is missing here) findings, discussion, recommendation,

Introduction: Ahara vidhi literally means method of taking diet. It includes diet and dietary guidelines. The concept of diet in Ayurveda has a broader view beyond ingestion of food, unlike modern dietetics which is restricted to concept of calorie consumption, Ayurveda recommends methods of taking food, its quality and quantity based upon individual's capacity to digest (Agni). **Material-** Development of Questionnaire on the basis of Literature available in Ahara vidhi-Dietary Guidelines in Ayurveda Classics. **Methods:** Proper guideline of development of questionnaire has been followed. **Results:** After the Development of Dietary Questionnaire the questioner sent to the expert to check the face validity and content validity of the Questionnaire with proper concept statistical **Analysis.** **Discussion:** In this article, various aspects of concept of diet in Ayurveda are discussed.

Keywords: Dietary, Code of conduct, Questionnaire

Introduction: The researchers observe that when food enters in to mouth and passes through the digestive system, it send the interacting signals to the brain, loaded with sensory, nutritive, and other information. Thus, the digestion and metabolism is not limited to ingestion of food only; but it is affected by how the brain and nervous system receives and processed the information too. This article describes classification of food, quantity of food, dietary guidelines and important factors influencing digestive health. Classification of food and development of questionnaire are based on following points. Purpose to Assessment of proper quantity of food and create eating awareness in the society.

Comment [IT3]: This section should highlight the background information on the dietary questionnaires and bring out the missing aspects that need to be beefed up in the Ayurveda questionnaire
Adopt, "It was observed that.." rather than the researcher observed
Write in a continuous prose

Material Methods: Available Literary source, e-search engine etc.

Comment [IT4]: Refer to the title, what exactly are you studying?

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Development of Questionnaire: based on Dietary guidelines.

Comment [IT6]: Describe in detail how you used these sources, justify the selected sources, excluded sources?

Proper quantity of food: One must take food in proper quantity. The actual Matra/Quantity of food changes as per the individual and depends on the strength of Agni (digestive power). It is the proper quantity of food which is digested in time without disturbing the Dhatusamya.¹

Dietary guidelines advise to take food according to energy requirement based upon age, gender, physiological conditions like pregnancy, lactation and level of physical activity. The goal is to maintain ideal body weight and optimal nutrition status²

Proportion of heavy and light to digest food:The Proper quantity always depends upon the substance itself. It is Based on the food-article itself, it is advised that heavy to digest articles should be taken up to one third to one half of the satisfaction of capacity of stomach); The remaining proportion shall be filled with light to digest food. Neither heavy to digest not light ones should be taken in surfeit in order to maintain the strength of Agni³. Eating variety of food (sarva graha) or single substance (parigraha):The healthy eating pattern includes taking all types of foods together (sarva graha) and not a particular substance (parigraha) at one time. This affects the digestion and metabolism of food⁴. For

example, eating a dish containing all food items like roti, curry, dal, rice together has a different effect than eating only rice at one time. This also affects the overall nutrition status.

Three divisions of stomach: The total capacity of stomach can be divided in three functional parts for deciding the proper quantity of diet. One part of solid, one for liquids and third part can be left empty for movement of dosha. Therefore, one shall fill stomach up to maximum of two third of its capacity with equal proportionate ingestion of solid foods and liquid beverages. This preserves health and prevents diseases⁵.

Assessment of proper quantity of food: The assessment of proper quantity of food can be done by observing following signs after consumption of food:

1. No feeling of undue pressure in abdomen due to ingested food
2. No feeling of heaviness due to food or feeling of lightness
3. No obstruction in functioning of heart or no congestion or heaviness in chest and flanks
4. Feeling of satiety and nourishment in senses
5. No feeling of hunger and thirst
6. Comfortable and ease in movements while standing, sitting, walking, exhaling, inhaling, laughing and talking
7. Normal digestion of food taken in morning and evening
8. Enhancement of strength, complexion, and nourishment of tissues.
9. Symptoms of taking less or insufficient quantity of food
10. Reduction in strength, complexion and nourishment of body tissues,
11. Lack of satiety, dis-satisfaction,
12. Altered peristalsis and abnormal functioning of vayu
13. Impairments in vital functions, quality of body tissues (sara), sexual stamina (virility) and ojas (vitality)
14. Impairment of the body, mind, intellect, and sense organs
15. Feeling of in-auspiciousness or dirtiness
16. Susceptibility to disorders of vata
17. Signs of taking excess quantity of food
18. Sudden aggravation of all three dosha in abdomen
19. Either obstruction of all the movements in the abdomen (sluggish bowel)
20. or Sudden elimination through upper and lower channels of the alimentary tract (cholera)
 - Aggravation of Vata causes colic pain, distension of the abdomen, body ache, dryness of the mouth, fainting, giddiness, variability in digestive power, rigidity in flanks, back and waist and contraction (spasm) and hardening of vessels.
 - Aggravation of Pitta causes fever, diarrhoea, burning sensation inside body, thirst, intoxicated state, giddiness and delirium.
 - Aggravation of Kapha causes vomiting, anorexia, indigestion, fever with cold, laziness and heaviness in the body⁶.

Dietary Questionnaire:

1. Do you follow 5 rights of AYURPOSHAN i.e, right time, right quantity, right quality, methods and place?
2. Do you adopt the habit of having meal on time (kalabhajana), only on feeling of hunger and after digestion of previous meal?

Comment [IT7]: Is this what exists? Or the one you developed? Check on best practices in development of a questionnaire? Closed ended/open-ended

3. Do you consume/ take minimum 3 meals (breakfast, lunch, dinner) per day with gap of atleast 2 and half hours between each meal?
4. Do you consume the optimum quantity of food based on signs of fullness to avoid overeating/ undereating?
5. Do you feel 3 part of stomach (trividhkukshi) to fill one part with cold, one part with liquid and keep the third part empty, so that one should consume food less than one's satiety?
6. Have you felt that any food you eat is easy to digest, pleasant to mind and freshly cooked food?
7. Do you consume food having or comprising of six tastes (6 rasa)?

Ayurveda mentions about 6 Rasa-

Madhura rasa – sweet

Amla rasa – sour

Lavana rasa – salt

Katu rasa- pungent

Tikta rasa- bitter

Kashaya rasa- astringent

8. Do you consume/ take food with due respect?
9. Do you consume food with concentration (by avoiding/ watching TV and talking while eating)?
10. Do you ingest food calmly, neither too slow nor too fast?
11. Do you maintain proper hygiene at the culinary place?
12. Do you prefer regional fruits, vegetables, food articles in daily dietary regimen?
13. Do you practice traditional food processing/ technique?
14. Do you use Iron utensils preferably for cooking of food except sour food items, garlic, etc.
15. Do you change your meal time from day to day?
16. Do you eat seasonal / regional food articles which are fresh?
17. Does your daily diet contains spices like jeera(cumin seeds), dalchini (cinnamon), sunthi/ardrak (dry/fresh ginger), lasuna (garlic), elaichi (cardamom), rai (mustard), etc in appropriate, in small quantity?
18. Do you cook food in non-iron utensils which is having less iron content as compared to food cooked in iron utensils?
19. Do you drink warm water preferably daily as per your body's need?
20. Do you use copper utensils for storage of drinking water if possible?
21. Do you drink too much water immediately before and after meals?
22. Do you eat same dishes several times a week?
23. Do you prepare vegetable or grains you like to eat often, distinctly(sauté, steam, roast or bake or combine with other grains, vegetables or herbs for variety?

24. Do you have diet, food contain maximum food groups (cereals, pulses, fruits, veg, milk and milk products)?
25. Do you take/ consume non vegetarian diet which includes fish, meat, and meat products as per the requirements?
26. Do you cook your food with oil which is cold pressed, non - refined (kacchighani)?
27. Do you use traditional oils like sarason- mustard, til- sesame, nariyal- coconut oil, mungphala- groundnut oil)?
28. Do you eat specific/ millets/ like jowar, bajra, rice, etc?
29. Do you stay in empty stomach for prolonged period/ time?
30. Do you eat food, re heating, at night or late night, curd at night, take caffeine, alcohol, carbonate, drinks, and vitality boosting fruit juices?

Statistical Results to the Questionnaire:

correlations/variables

1.Meal_habits 2.Min_Meals 3.Optm_Food 4.Fullness_of_stom 5.Easytodigest 6.SixTaste (6) _M sixTaste_A sixTaste_L sixTaste_K sixTaste_T sixTaste_Ks 7.FoodRespect Food8.Contn FoodCalm 9.foodHygiene 10.RegnlFood 11.TradiFood 12.FeUtensil 13.MealTime 14.SeasonlFood 15.spiceFood 16.NonFeUtensil 17.HotDrink 18.CuUtensil 19.BandAfWater20.MeasameDIshSevera 21.vegTooEat 22.MaxFoodGrps 23.NonVeg Oil24.FoodsFried25.TradiOils

Comment [IT8]: Check o formatting

Benefits of proper quantity diet: The food taken in right quantity certainly provides strength, complexion, happiness and longevity to the person; without disturbing the normalcy⁷. It maintains equilibrium of dosha, normal digestion and metabolism (Agni), easily passes down through the bowels, and gets digested without discomfort. If food is taken in excess quantity, it leads to disorders due to over nutrition and vice versa, A large number of disorders including obesity, cardiovascular diseases including coronary artery disease and hypertension, diabetes, cerebrovascular stroke are caused due to over nutrition. Malnutrition results in Kwashiorkor/Marasmus, iron deficiency anaemia, stunting, wasting especially in children.

Comment [IT9]: Which section of the article is this? Discussion???

Sequence of eating food items: The food with sweet taste shall be taken in the beginning followed by those with sour and salty taste. The food with other tastes like pungent, bitter and astringent shall be taken at last. According to the source of food, fruits should be taken in the beginning followed by liquid gruel (peya). Then the variety of solid eatables (bhojya and bhakshya) can be taken. The best fruit to be taken at the beginning is Indian gooseberry (amalaka)⁸. This sequence of taking food is based upon the status of digestive factors (Agni) and post digestive effects (vipaka) of food. The sweet food items are generally heavy to digest and can be digested easily when taken at first in the presence of peak strength of digestive power (Agni). The first phase of digestion after taking meals is dominated by effect of sweet taste (madhura avastha paka), followed by sour taste (amla avastha paka) and ended by pungent taste (katu avasthapaka). This sequence is applicable only in person with normal digestion capacity (Agni). In case of abnormal digestion, the sequence can be changed according to the disease condition. The recent researches showed taste like cells in the gut. These cells play an important role in integrating physiological responses during digestion. These taste receptors also influence eating pattern. The relation between sequence of eating food and its impact on taste receptors in gut need more studies.

Food articles for regular consumption and preservation of health: One should regularly consume shashtika rice (*Oryza sativum*), shali rice (varieties of *Oryza sativum* rice), Green gram (mudga, *Vigna radiata*), rock-salt, Indian-gooseberry (amalaka, *Phyllanthus emblica*), barley (yava *Hordeum vulgare*-), water, milk, ghee, flesh of animals of arid habitat (jangala) and honey⁹. Those food items, which maintain health as well as prevent onset of diseases should be included in daily regimen¹⁰. One should always take food of all tastes¹¹

Forbidden food articles for habitual consumption: One should not have the habit of taking dried meat, dried vegetables, tuber of lotus (Shaluka, *Nymphaea alba* Linn.) and stalk of lotus (Bisa, *Nymphaea alba* Linn.) as these are heavy to digest. One should never eat meat of emaciated animal¹². Regular consumption of coagulated milk, cream-cheese, pork, meat of cow and buffalo, fish, curd, black-gram and wild-barley should be avoided¹³. Accordingly, one should never eat such heavy to digest articles as preparations of flour, rice, flattened rice etc., on top of a meal. Even while hungry one should take them in right quantity¹⁴. Salt, saturated fats, and excess sugar are disease causing. Excess consumption of animal products leads to premature ageing, increased risk of chronic diseases and higher cause of mortality. Refined carbohydrates including white rice, white bread, sugar, honey, maple syrup, agave nectar lead to overweight, diabetes, dementia, mental illness and cancer. The fast and processed food includes chips, soda, cookies, candy, breakfast cereals, bars, French fries, burgers, pizza, white flour baked goods, and all other high-calorie, low-nutrient foods that people often eat multiple times per day. These food items contribute to obesity, diabetes, heart attacks, strokes, dementia and cancer. This has resulted in decreased longevity. The fast food, processed food, commercial baked goods, and sweets may also be linked to destruction of brain cell and a lowering of intelligence. Candy and sweetened baked goods may even stimulate the brain in an addictive fashion, which can lead to more serious illnesses. Hence they shall be avoided. One should never eat food which is not sacredly prepared (achoksha), contaminated, with stone particles, grass or hair etc. The food which causes aversion, kept overnight, foul smelling and stale shall be avoided. The food which does not have its natural taste, hardened due to passage of time, cold, re-heated, with oozing and moisture, burnt shall not be taken¹⁵. Reheated foods cause more oxidative stress through formation of aldehydes and increase the risk of degenerative illness and atherosclerotic disease. Reheating of cooking oils like corn, soyabean, and sunflower oils produces toxin named 4-hydroxy-trans-2-nonenal (HNE). This is responsible for increased risk of cardiovascular disease, stroke, Parkinson's disease, Alzheimer's disease, Huntington's disease, various liver disorders, and cancer. Therefore reheating of food shall be avoided. One should not be habituated to consume food having a single taste, foods of inferior quality, unsuitable to human being and sour foods.¹⁶

The suppression of urge of hunger and its treatment: One shall not suppress the natural urge of hunger for a longer duration. It leads to emaciation, weakness, change in body complexion, generalized body ache, aversion (to food) and dizziness. Such cases are treated by unctuous, hot and light (easily digestible) food is advised¹⁷. These effects are observed after starvation for a longer time due to depletion of glucose, then fatty acid break down and formation of ketone bodies. The treatment is done with sips of water mixed with glucose, fruit juices to avoid refeeding syndrome.

Personal well being: One Should eat after washing hands, face, mouth and feet and dressed appropriately. Reciting mantras, offering oblation to God, departed forefathers, guests and dependents is good practice. Wearing of precious stones while eating has been the practice in the past, is being followed in some societies¹⁸. It is important to maintain personal hygiene, prevent negative effect of metaphysical powers while eating.

Effect of sound on health: Reciting mantra before eating is observed in some societies. Mantra is a sacred utterance, a numinous sound, a syllable, word or phonemes, or group of words in Sanskrit believed by practitioners to have religious, magical or spiritual powers. Hymns and sacred chants are observed in all religious scripts. The term mantra in Sanskrit means "to think". Since ancient times, mantras have been used to calm the mind and produce a sense of peace. Recently, scientists have confirmed this calming effect and have discovered the causal factors within the brain/mind that bring it about. Mantra (prolonged repetitive verbal utterance) showed psychological calming effect by reducing the blood oxygenated level dependent signals in brain. The structure of Gayatri Mantra is in perfect tune with the science of cosmic sound. Chanting of mantra can enhance spiritual energy, increase self-awareness, cognizance level. On the other side, ample evidence shows that exposure to environmental noise has adverse effects on the health of the population. A report from the world health organization showed evidence on the relationship between environmental noise and health effects, including cardiovascular disease, cognitive impairment, sleep disturbance, tinnitus, and annoyance.

Influence of mental status on digestion: One should eat with a stable and pleasant state of mind. The wholesome food, though taken in the right quantity, does not get digested properly, if the mental state of the person is riddled with anxiety, grief, fear, anger, or restlessness and irritability due to lack of sleep¹⁹. One should not take food with greed, ignorance, passion/desires, greed, infatuation, envy, bashfulness, conceit, excitement and fear in mind. The negative mental factors can harm the digestion process leading to formation of ama (undigested food) and a number of metabolic disorders.²⁰

One should eat with utmost concentration on the food and avoid mental distractions like watching television, reading newspapers, checking emails and working. One should avoid talking or laughing during meals. This can lead to the same defects as by eating too fast discussed later in this article²¹. The mental distractions showed overeating leading to obesity. While paying attention to a meal was linked to eating sufficient meal and lesser chances of gaining weight. Thus, paying attention to meal is directly linked to satiety and weight gain. A concept of mindful eating is originated on these practices.

Pleasant surroundings: One should eat in pleasant surroundings with soothing fragrance around. Facing towards the north direction while eating is said to have beneficial positive effect on health. According to ancient Indian architecture (vastu shastra), the north direction is full of divinity and spiritual energy. However scientific research is needed to study effect of direction while eating.

The attendants serving food shall be loyal, disciplined, clean and devoted to impart pleasant surroundings²².

Appropriate place of eating and accessories: One should not eat at crowded place to avoid mental distractions and spread of micro-organisms through contact²³. Physical distancing measures should be followed to avoid microbial infections from person to person. One should eat at a suitable place. It is important to feel comfortable and satisfied while eating²⁴. Cooking and dining place (mahanasa) shall be clean, spacious and sacred with stay of pure hearted people (apta-avyabhicharinah)²⁵. Utensils made up of metals shall be used to process and store cooked food²⁶. The hygiene at the place of eating is of utmost importance to avoid microbial contamination of food and its diseases. The utensils used for cooking, preparing and storing food shall not possess antagonistic properties to that of food. The interaction can cause harmful effects on health.

Duration of taking meals: One should not eat too fast to avoid entry of food particles in nasal passage. By eating with normal speed, the person is able to ascertain the qualities and taste of the food

or even detect any defects in the food²⁷. One should not eat too slow. Eating too slow can affect satiety and lead to eating in excess quantity. As the time passes, the cooked food becomes cold and is not digested properly²⁸..

A research on eating speed shows that eating quickly (within 9 minutes) leads to poor digestion, increased weight gain, and lower satisfaction. However, slow eating for 29 minutes showed better digestion, better hydration, easier weight loss or maintenance, and greater satisfaction. Mindful eating has suggested ideal eating time as 20 minutes with complete attention on meals.

GUIDELINES AFTER MEALS

Taking water, Water shall be taken in suitable quantity during meals and after meals²⁹. Drinking suitable quantity of water during meals assures proper passage of food in alimentary canal, mixing in stomach and digestion.

Mouth cleaning and Mouth freshener: To prevent decaying of teeth and bad smell (halitosis), mouth should be thoroughly cleaned after eating³⁰. Kapha is aggravated after taking food and produces discharge in oral cavity. One shall take mixture of areca nut (puga), cubeb (kankola), camphor (karpura), clove (lavanga) or fruits of pungent, astringent taste with betel leaf as mouth freshener³¹.

Lifestyle: After taking food, one should sit comfortably like a king (rajavat) till the drowsiness due to food is over. After that one should walk slowly for hundred steps and rest by lying on the left side. One shall observe those measures which soothes, nourish senses and feels good³². After meals, sleeping and sitting for longer time, excess liquid diet, exposure to heat, swimming, travelling, riding shall be avoided³³.

Faulty dietary habits: The improper dietary habits disturb process of digestion and metabolism (Agni), lead to formation of ama (undigested food and toxins) and cause severe diseases of various body systems³⁴. (The following dietary habits can cause severe diseases or death. Taking of wholesome and unwholesome food together (samashana) shall be avoided.

- Taking food in excess quantity or less quantity or at improper time (vishamashana) shall be avoided.
- Taking food without complete digestion of previous meals or during indigestion (ajirna) (adhyashana) shall be avoided^{35,36,37}
- **Importance of food**

Food is most essential for sustenance of life (vrittikara)³⁸. The body is constituted and nourished by food³⁹. The origin of life and diseases is food. Wholesome and unwholesome food articles are responsible for happiness and sorrow respectively. Food decides whether the body can or cannot sustain the diseases of body and mind⁴⁰. The ingested food after proper digestion and metabolism nourishes the tissues, results in plumpness, strength, complexion, health and longevity. The tissues are sustained by getting fed by various nourishing factors (poshaka dhatus)⁴¹. A detailed list of dietary preparations and therapies having superior qualities (agrya samgraha) that keep a person healthy is given in chapter Yajjah Purushiya Adhyaya. A skillful physician should prescribe the right dietary regimen and therapy after gaining a thorough understanding of the qualities of these articles. Attainment of eternal duties (dharma) and all desires (kama) depends upon this prescription⁴². **Multi-factorial effect of food and diet in health and diseases:** An individual consuming wholesome food is not afflicted by disease. However, intake of wholesome food is not the only causative factor for a disease or can prevent diseases. Apart from unwholesome food, there are many other etiological

factors that lead to a disease, such as change in season, intellectual errors, unwholesome contacts, excessive, wrong and over-utilization of senses of sound, touch, vision, taste and smell.

Conclusion:

These etiological factors can cause diseases in an individual despite wholesome intake of tastes (rasa) and diet. Hence, an individual taking wholesome food has also been observed to have taken ill. Similarly, consuming unwholesome diet does not immediately produce untoward effects. All unwholesome food articles are not equally harmful, all the dosha are not of equal strength, and all the bodies are not capable of preventing disease.

Unwholesome food can be more harmful depending upon the habitat, season, combination, potency, and intake in excessive quantity. The dosha become acute and extremely difficult to manage when they get associated with multiple factors, treated with wrong therapies, become deep rooted, chronic, get vitiated in one of the ten seats of vitality (prana), and when they afflict vital centers within the body called as Marma.

Individuals, who are excessively obese, emaciated, whose muscles, blood, bones are depleted, who are physically very weak, who are habituated to consuming unwholesome food, who take in inadequate quantities of food, and who have very weak mind cannot withstand diseases. Contrary to this, individuals having opposite qualities to the ones mentioned above are capable of resisting diseases. Thus, unwholesome diet, dosha, and body constitution factors produce diseases of mild, severe, acute and chronic nature⁴³.

NOTE:

The study highlights the efficacy of "Ayurveda " which is an ancient tradition, used in some parts of India. This ancient concept should be carefully evaluated in the light of modern medical science and can be utilized partially if found suitable.

Comment [IT10]: Should this be your title then?

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