

Therapeutic diet for primary care

Amrita Ghosh¹, Swapan Kumar Paul^{2*}, Ranabir Pal² and Shrayan Pal³

¹Department of Biochemistry, Medical College, 88, College Street, Kolkata-700073 West Bengal, India, ²Department of Community Medicine, Mata Gujri Memorial Medical College & Lions Seva Kendra Hospital, Kishanganj-855107, Bihar, India and ³Department of Dermatology, Venereology and Leprosy, Mata Gujri Memorial Medical College & Lions Seva Kendra Hospital, Kishanganj-855107, Bihar, India

Abstract: *Background:* Therapeutic diet is an important concept in health and disease, and should be taught at all levels ranging from healthcare providers, stakeholders, and to healthcare seekers equally, without any prejudice, which is not done at present; so this review is applicable for the current scenario and will help sensitise readers regarding this crucial issue. *Objective:* A narrative review was taken up, which was very much required for a concerted all round application for a fruitful teaching-learning. *Methods:* Thirty-six research studies were identified from 73 potentially relevant articles. Studies and data bases were selected on, firstly, all therapeutic nutritional plans and corresponding diets in disease among published literature were sketchily searched, secondly, 'Therapeutic diets' impacting diagnosis and prognosis in different morbidities were identified, thirdly, published reports from apex bodies of global importance like World Health Organization (WHO), Centre for Disease Control (CDC), Atlanta USA and others were given due weightage for their multi-authored authenticity. *Results:* In spite of substantial growth in healthcare, the quality of research on therapeutic diets is sparse and often restricted to discharge from hospital and not reported in structured form without any research on compliance on dietary advices. In this review, various diets in different diseases and health conditions have been discussed in detail by especially taking up their pros and cons for the best possible outcome. *Conclusions:* In the current scenario we felt that nutrition is an orphan chapter in the healthcare field and we require more research about therapeutic diets as it is very useful in daily medical practice from primary level to tertiary care levels for the improvement in clinical approach and treatment in patients with diverse diseases.

Keywords: Diet, Disease, Therapeutic Diet, Nutrition.

Introduction

All the healthcare providers are of the opinion that there is no doubt whatsoever; regarding importance of 'therapeutic diets,' while managing patients in different diseases. There is a long standing dilemma among the academia regarding the appropriate time in the spectrum of undergraduate and postgraduate healthcare courses and curriculum where the teaching-learning on therapeutic diets will be pertained [1-3]. Based on specific requirement, diets are to be planned to preserve health during pathogenesis and salutogenesis by adjusting stepwise configuration of normal diet to therapeutic diet and revert back, helps body to metabolise and excrete harmful substances [4-6]. In the current scenario the researchers of the study felt that an all-inclusive discourse is much needed to help stakeholders in the healthcare field sensitise

regarding this crucial issue. So a critical evaluation of therapeutic diets was attempted from the published literatures.

Material and Methods

We attempted a comprehensive, annotated assembly of survey results by exploring various resources; published surveys, and field studies, meeting presentations, and personal communications about recent surveys, not included in previous analyses in which, diets in diseases were reported. Through an extensive search in indexed literatures and website-based population survey reports, we identified thirty-six research publications from 73 potentially relevant articles. The search terms included combinations of MeSH terms and empirical taxonomies from diets in different diseases.

Pubmed-entrez, Cochrane Library, Web of Science and WHO Global Health Library including searching of abstracts were done from scientific meetings. In the absence of monolithic pattern of reporting and nationally representative database, all the reports on therapeutic diets were considered.

Selection Criteria: Firstly; literature sources of diets in diseases were searched; Secondly, research reports on 'therapeutic diets' impacting diagnosis and prognosis of diseases were identified and collated, Thirdly, globally published information from apex bodies e.g. WHO, Centre for Disease Control and prevention, Atlanta, USA and others were given due weightage for their multi-authored multi-disciplinary authenticity.

Primary Outcome Variables: Therapeutic diets for better prognosis of morbidities

Results

Regular (Balanced) Diet (for ambulatory patients): This may be at times provided with required caloric content by omitting fried foods, desserts, cream, sauces, and dressings. Special stress has to be made to see that it must be palatable and easily digestible.

Liquid Diet: Conditions where liquid diet is used are after surgery, cardiac diseases, acute infections or digestive problems, during vomiting or diarrhoea and during imaging of digestive tracts; used only for short periods as usually these patients will be nutritionally compromised. Liquid diets are of two types: clear liquid diet and full liquid diet. Water, apple or grape juice, fat free broths, ginger soup, tea and coffee are clear liquid diets; whereas strained soups and cereals, fruit and vegetable juices, yoghurt, hot cocoa, custard, ice creams, pudding and sherbet are full liquid diets. They are mostly made up of soft food items, chopped, ground, mashed, pureed and moist to make easy to chew and swallow [7-8].

Diabetic Diet: Educating the patients regarding self-care including diet and lifestyle modifications in diabetes delay microvascular and macrovascular complications; prevent dysglycemia and dyslipidemia by maintaining appropriate blood sugar and lipid level; maintain overall good nutritional status; to reach and

sustain appropriate weight with culture specific religion sensitive dietary advices. The first and foremost is to make a diabetic diet plan, which will usually contain food choices to eat at every meal using, what is known as the 'portion and exchange' lists that will have groups of food items having same amount of carbohydrate, protein, fat and calories. There are three main groups: carbohydrate group, meat and meat substitute group and fat group. Carbohydrate group contains starch, fruits, and vegetables; likewise meat and meat substitute group have lean, very lean, medium fat and high fat meat and substitute; whereas fat group have monounsaturated, polyunsaturated and saturated fat items [9-13].

Low Calorie Diet: It is usually prescribed for weight reduction by reducing the calorie intake at a level to force the body to use its own fat stores. Low calorie diet is advised for persons with BMI 30, wherein the calorie containing food items are reduced to a maximum of 800 calories per day to lose about 1.2–2.2 kg per week and on average of 20 kg over 12 weeks. In persons with BMI more than 30, very low calorie diets are advised which may improve weight related problems like diabetes, high blood pressure, and increased cholesterol. In persons with BMI 27-30, very low calorie diets to be advised only if they have weight related problems; but these diets are not suitable for pregnant and lactating women, children, teen agers and over 50 years of age. As such in low calorie diets, high calorie foods such as butter, cream, whole milk, cream soups or gravies, sweet soft drinks, alcoholic beverages, salad dressings, fatty meats, candy and rich desserts are generally omitted [14].

High Calorie Diet: This diet is suitable for persons who are underweight or for persons who want weight gain in a healthy way where, at least 3000 calories should be consumed daily. High calorie diet include meats, tofu, cheese, milk, beans, sweet potatoes, whole grains, nuts, butter, cream, candy and rich desserts etc., but frank sugar should be avoided [14].

Low Cholesterol Diet: Liver manufactures almost the entire cholesterol, the body needs;

problems arise, only when it gets misbalanced. There is a longstanding paradigm that dietary cholesterol adds to harmful effects in increasing blood cholesterol levels, which in the light of recent researches has been contradicted. Many food items contain good amount of cholesterol e.g. eggs, meats and milk products. Yet, it is reported that a variety of food groups viz. whole and multi grain products like bran and oats; fatty fishes (salmon, mackerel, tuna etc.); foods rich in antioxidants like fruits and vegetables and food rich in omega -3 fatty acids like avocado, flax seeds, olive oil etc. can help lower cholesterol level [15].

Fat Restricted Diet: Body stores extra calories as fat; even then, we must be watchful to consume adequate calories in fat restricted diet to suffice day to day requirement. It is observed that, if high fatty foods are replaced by high calorie diets (like sweets) a person may gain weight rather than losing it. So to lose weight it is mandatory to keep the equation of diet balanced by burning more calories, than what is consumed in diet by doing age-specific workouts. In a low fat diet, food items which may be included are whole-grain products, fruits, vegetables, moderate amount of lean meat and dairy products, dried beans and peas, tofu, low-fat yoghurt, skimmed milk, low-fat cheese, flax seeds, and walnuts etc. In addition, tips to be followed strictly for low-fat cooking are avoidance of visible fat/oil and removal of skin from poultry; removal of hardened fat on top of soup, gravy, stew after refrigeration; baking, boiling, or grilling to be done on a utensil that allows fat to drip; using non-stick pans with minimum oil to fry; topping with cheese, butter, or cream-based sauces to be replaced by sprinkling lemon juice, herbs, and spices on cooked vegetables [15].

Sodium Restricted Diet: This diet is suggested in hypertension, kidney diseases and edema wherein daily sodium intake not to exceed 1500mgs; includes vegetables and fruits like apple, orange, banana, spinach, carrot, broccoli etc. with low sodium and excludes naturally high sodium content food items, e.g. meats, seafood, eggs and dairy and prepared items like canned foods, junk foods, snacks, pickles etc [16].

High Protein Diet: This diet is usually recommended for bodybuilding, and/or when we

want to reduce appetite and hunger between meals prepared with soya, beans, nuts, fish, lean meat and low fat dairy products. In addition fibre-rich carbohydrates like whole grains and fruits and vegetables to be included. However, High protein diet for long period may lead to bad breath, headache, constipation, cardiovascular ailments etc [17].

Low Protein Diet: This is recommended for liver and kidney diseases and protein metabolism disorders; advised with increased intake of low protein foods like fruits and vegetables; avoid animal protein food items like meat, fish, eggs, and legumes, nuts, oil seeds and dairy products; more than 1.5 grams/Kg/day protein is harmful [18].

Bland Diet: This is recommended in gastrointestinal diseases like peptic ulcer, vomiting, diarrhoea, nausea etc. Bland diet is usually made soft in texture, low in fibre and with high pH value with mild seasoning keeping in mind that taste and choices should never be compromised; may include low fat dairy products, vegetables (boiled or steamed), low fibre fruits, grains, poultry, eggs and fish with little or no fat [19].

Low Residue Diet: This diet is only a temporary eating plan to reduce amount of stool in large intestine; recommended after recent bowel surgery e.g. ileostomy, colostomy, and bowel resections or while preparing for bowel surgeries, keeping in mind that dietary fibres should not be more than 10-15 gms/day; also advised in Crohn's or diverticular disease; may include refined grain products like white breads, cereals, white rice, juices, meats, fish and eggs, fruits without peels and seeds, well cooked vegetables, milk, curds, puddings etc [20].

Diet in Mild and Moderate Under-Nutrition: Children with mild or moderate under-nutrition do not need drastic changes in their diet or to replace the family diet. Instead nutritional counselling and adding few food supplements (which cannot be provided by locally available foods) needed to give at least 150 Kcal/Kg/day with 3 grams protein/Kg/day. Breast feeding must be continued alongside, keeping in mind to give frequent

small feeds, preferably liquid diet with initial vitamin A and folic acid fortification [21].

Severe Acute Malnutrition (SAM): In developed countries SAM children are treated with Ready to Use Therapeutic food (RUTF) which are relatively expensive; in developing countries like India home-based diet supplement 3-4 grams protein & 200 Cal/ kg body weight/day are advised with special emphasis on correction of fluid & electrolyte imbalance, control of infections and infestations; supplementation of vitamins & minerals;; counselling caregivers for diet to decrease mortality and improve outcomes [22].

Diet in Adult Under-Nutrition: Adult under-nutrition, caused due to insufficient healthy and balanced diet, is ignored as clinical entity and usually under reported; sometimes caused by different health problems. So healthier foods with high energy and high protein content to be added in their diet; starting with light properly cooked food and adequate fluid intake; water drained from boiled green grams, sugar cane and fruit juices, vegetables soups, porridge of lentil and rice or pulses and cereals, milk and milk shakes; increase intake of Vitamin A and E ; fresh fruits and vegetables, especially green leafy vegetables; meat, eggs, fish, kidney and liver, fish liver oils; whole grains, peas, lotus stem, pulses, legumes and oil seeds; seafood (especially oysters), beef, oatmeal, chicken, liver, milk, spinach, sea plants, nuts and seeds; whole wheat grains provide good amount of zinc; have high energy food / drink like sugarcane juice, fats; consumption of fresh fruits and raw vegetables advised [23].

Total Parenteral Nutrition (TPN): In this method nutritional requirements is provided by dripping nutrient solution directly into a vein bypassing the digestive system when normal oral feeding is not feasible e.g. Crohn's disease, Gastrointestinal obstruction and carcinoma, paralytic ileus, generalized peritonitis, intractable vomiting; when food is incompletely absorbed e.g. injuries, burns, ulcerative colitis, radiation therapy, short bowel syndrome chemotherapy etc.; when food intake is undesirable and prudent to rest bowel e.g. post-bowel surgery, chronic inflammatory bowel diseases, intractable diarrhoea; who are able to ingest food normally, but refuse to do so e.g. geriatric post-op case, anorexia nervosa,

psychiatric depression etc [24]. TPN management take account of water (30-40mL/kg/day), energy (30-45 kcal/kg/day), amino acid (1-2g/kg/day, essential fatty acid, vitamin & mineral, normally given through a central venous line. Whereas, children in need of TPN have calculated fluid demand with more energy (up to 120kcal/kg/day) and amino acids (up to 2.5-3.5 g/kg/day); most calories, supplied as carbohydrate, typically 4-5 mg/kg/min of dextrose. Up to 10% of patients may develop complications related to central venous access; more than half recipients catheter-related sepsis; hyperglycaemia or hypoglycaemia or liver dysfunction in 90% of cases avoidable by close monitoring of plasma glucose and adjusting insulin.

Hepatic complications may occur during initial phase of TPN, also hyper-ammonemia may develop in infants causing lethargy, twitching, and generalized seizures; other complications are thromboses, pneumothorax; catheter related infections; hepatobiliary, respiratory, cardiovascular, renal complications; early metabolic complications are hyperglycaemia, re-feeding syndrome, fluid & electrolyte disturbance with hypokalemia, hypophosphatemia, hypomagnesemia, hyperchloremic acidosis; late complications are essential fatty acid, trace mineral, vitamin deficiency; metabolic bone disease; hepatic steatosis; hepatic cholestasis.

Wilson's Disease: Copper is essential for good health and required in small amount. In Wilson's disease, copper is deposited in the eyes, brain, kidneys, and liver, leading to various complications locally including cirrhosis of the liver. Copper is found in different amounts in a wide variety of foods and it was considered to restrict dietary copper in Wilson's disease. But contrary to popular belief studies have shown that an increase in dietary copper actually decreases the absorption from gut, so it is unnecessary to restrict the copper rich food groups (except shellfish and liver). D-penicillamine and Trientine are used to excrete excess copper with urine with addition of zinc in diet causing reduction in copper absorption [25-26].

Celiac Disease (CD): It is a permanent gluten intolerance, whose pathogenesis involves multiple factors including genetics and environment presenting with common GI symptoms. The only treatment available till date is strict elimination of Gluten containing food items from diet irrespective of acute or chronic co-morbidities to avoid exacerbation of symptoms and inflammation of the gastrointestinal mucosa and reduce risk of developing lympho-proliferative malignancy and immunological disorders. Excluding gluten affects limiting of food variability causing uneven intake of natural macro and micronutrients leading to clinical and subclinical deficiencies. Tailor-made dietary options from naturally available gluten free food items and long-term follow-up needed.

Recently the role of FODMAPs (Fermentable Oligo-, Di-, and Mono-saccharides And Polyols) is advised to change gut microbiota and to improve symptoms. As Irritable Bowel Syndrome (IBS) and CD and have close clinical presentations, a therapeutic trial with Gluten Free Diet can differentiate them clinically [27].

Eucaloric Diet: A diet containing same number of calories required daily, based on age, gender, weight, activity level and occupation etc. to help maintain normal health [28].

Fluid Requirement and Maintenance: Segard Nomogram proposes daily fluid requirements as: 100 ml/Kg for the 1st 10 Kg of the weight; 50 ml/Kg for the 2nd 10 Kg of weight; 20 ml/Kg for the remaining weight [29].

Discussion

The primary and essential role of therapeutic diet is to maintain the health of the individual during care and cure of diseases, by improving all types of clinical and sub-clinical nutritional deficiencies. As per specific requirement, diet can be planned to maintain, decrease or increase body weight and can also eliminate food constituents to which individual may be intolerant or to give rest to the organs responsible for metabolism [4-6].

Changes from regular diet to therapeutic diet depend on the morbidity status of an individual, and accordingly there are arrays of steps for this. The first and foremost in the therapeutic diet is

the energy value, which may have to be either enhanced or lowered with macronutrients along with increased or decreased amount of micronutrients and roughage (fibre). The specific nutrient requirements in various types of diets (increased or decreased) depend on patients' need and specific type of food not tolerated may have to be eliminated altogether. Further, therapeutic diet may have to be modified to be acceptable during illnesses and then again modified in progressive steps a regular diet as the patient improves [5-6].

There are obvious hurdles to implement the concept of holistic diets that start from likes-dislikes, family practice, religious and other constraints to reinforce importance of diet. Further, capacity building in undergraduate and postgraduate healthcare courses on the basics of nutritional advice and importance of therapeutic diet is recommended to champion primary care at grassroots. [30-31]. National policy should have been oriented to make stakeholders to be aware of the importance of changes in dietary practice not only in preventing diseases but also to improve prognosis in managements of different illnesses [32]. We need an algorithm from a feel that healthcare providers have to learn everyday from the care-seekers and to help them with tailor-made advice, [33] and to utilise our health care delivery system for wider ramifications to advice on therapeutic diets at primary care levels to the last man on road [34].

Conclusions

Nutrition is the global orphan chapter in healthcare - till date there is no specialization for medical graduates on nutrition. We need to eliminate impediments with capacity building with dedicated changes in courses and curriculum in health care with shift of objectives from 'ready-made approach' to 'tailor-made approach' with a human face [35-36].

Acknowledgement

We are thankful to our authority to permit us to conduct the study.

References

- Gopalan C, Rama Sastri BV, Balasubramanian SC. Nutritive value of Indian foods, National Institute of Nutrition, ICMR, Hyderabad, India, 2004 (Cited on 5/10/2018).
- Therapeutic Diet. *J. Clin Nutri Diet.* [online] [cited on 05.10.2018] Retrieved from: <http://www.imedpub.com/scholarly/therapeutic-diet-journals-articles-ppts-list.php>
- Rustagi N, Pal R, Dudeja P. Good Cooking Practices in Kitchen in Eds. Dudeja P, Singh A, Kaur S. Food Safety Implementation: from Farm to Fork. *CBS Publishers and Distributors Pvt. Ltd. New Delhi.* 2016; Chapter 20, pp 181-190.
- The Importance of Therapeutic Diets. *Pedagogy* [online] [cited on 05.10.2018] Retrieved from: <https://www.pedagogyeducation.com/Main-Campus/Student-Union/Campus-Blog/September-2013/The-Importance-of-Therapeutic-Diets.aspx>
- Therapeutic diets. [online] [cited on 01.10.2018] Retrieved from: <https://www.laps.in/Therapeutic.pdf>
- Fad Food Diets vs Custom Therapeutic Diets. *Empower Health* [online] [cited on 01.10.2018] Retrieved from: <https://www.empowerhealth.ca/fad-food-vs-therapeutic-diet/>
- Types of therapeutic diets. *IHSS Training Academy* [online] [cited on 01.10.2018] Retrieved from: http://www.cdss.ca.gov/agedblinddisabled/res/VPTC2/9%20Food%20Nutrition%20and%20Preparation/Types_of_Therapeutic_Diets.pdf
- Types of therapeutic diet. *Livestrong.com* [online] [cited on 01.10.2018] Retrieved from: <https://www.livestrong.com/article/320563-types-of-therapeutic-diets/>
- Garg R, Chawla SPS, Pal R, Ghosh A. Impact of Health Education on Knowledge, Attitude, Practices and Glycemic Control in Type 2 Diabetes Mellitus. *J Fam Med Primary Care* 2018. [In Press]
- Ghosh A, Pal R. Glycemic control in Hypothyroidism and Type 2 Diabetes Mellitus. Published in the proceedings of WONCA 15th World Rural Health Conference WRHC 2018, New Delhi, April 2018 (Cited on 1/10/2018)
- Singh M, Pal R, Ranjan R, Sarker G, Bharati DR, Pal S. Diabetes and Dementia: Myth and reality. *J Krishna Inst Med Sci Uni* 2017; 6(4):12-17.
- Pal R, Pal S, Barua A, Ghosh MK. Health Education intervention on Diabetes in Sikkim. *Indian J Endocr Metab* 2010; 14(1):3-7.
- Paul SK, Ghosh A, Pal R, Pal S. Diabetes: Diet and concepts. *J Integrated Health Sci* 2018. Manuscript id: JIHS_18_18. [In press]
- 17 Best Foods for Dieters. *WebMD* [online] [cited on 01.10.2018] Retrieved from: <https://www.webmd.com/diet/obesity/features/17-best-foods-for-dieters#4>
- How to Lower Cholesterol with Diet. *Medline Plus* [online] [cited on 01.10.2018] Retrieved from: <https://medlineplus.gov/howtolowercholesterolwithdiet.html>
- Sodium-Controlled Diet. *Cleveland Clinic* [online] [cited on 01.10.2018] Retrieved from: <https://my.clevelandclinic.org/health/articles/15426-sodium-controlled-diet>
- A High-Protein Diet Plan to Lose Weight and Improve Health. *Health line Red* [online] [cited on 28.08.2018] Retrieved from: <https://www.healthline.com/nutrition/high-protein-diet-plan>
- A Complete Guide to a Low-Protein Diet. *Health line Red* [online] [cited on 01.10.2018] Retrieved from: <https://www.healthline.com/nutrition/low-protein-diet>
- Bland Diet: What to Eat and What to Avoid. *Health line Red* [online] [cited on 01.10.2018] Retrieved from: <https://www.healthline.com/health/food-nutrition/bland-diet>
- Should You Try a Low-Residue Diet? *WebMD* [online] [cited on 01.10.2018] Retrieved from: <https://www.webmd.com/ibd-crohns-disease/low-residue-diet-foods#1>
- Briend A, Prinzo ZW. Dietary management of moderate malnutrition: Time for a change. *Food and Nutrition Bulletin* 2009; 30(3):S265-S266.
- Severe acute malnutrition management in India's children: the riddle. *Field Exchange* [online] [cited on 01.10.2018] Retrieved from: <https://www.enonline.net/fex/52/acute-malnutrition-indias-children>
- WHO. Nutrition for older persons. *WHO* [online] [cited on 01.10.2018] Retrieved from: <http://www.who.int/nutrition/topics/ageing/en/index.1.html>
- Parenteral Nutrition. *Health Line Red* [online] [cited on 01.10.2018] Retrieved from: <https://www.healthline.com/health/parenteral-nutrition>
- Low Copper Diet for Wilson's Disease. [online] [cited on 01.10.2018] Retrieved from: <https://www.gicare.com/gi-health-resources/copper-restriction/>
- Russel K, Gillanders Lyn K, Plank L D. Dietary Copper Restriction in Wilson's disease. *Eur J Clin Nutri* 2018; 72:326-331.
- Taus M, Mignini EV, Fumelli D, Busni D, Nicolai G, Carletti C, et al. Celiac Disease: Gluten Free Diet and...What Else? *Open J Gastroenterol* 2016; 6:157-170.
- Bruso J. What Is a Eucaloric Diet?. *Healthfully* [online] [cited on 01.10.2018] Retrieved from: <https://healthfully.com/eucaloric-diet-6936905.html>
- Maintenance Fluid Requirements. *utmb Health Pediatrics* [online] [cited on 01.10.2018] Retrieved from: https://www.utmb.edu/Pedi_Ed/CoreV2/Fluids/Fluids4.html
- Pal R, Kumar R, Vidyasagar, Rustagi N, Mukherjee B, Sarbapalli D. Future direction of Family Medicine training in India. *J Family Med Prim Care* 2014; 3(4): 295-299.
- Pal R, Kumar R, Pal S, Vidyasagar, Mukherjee B, Sarbapalli D. Medical Education: The Hot Seat. *J Family Med Prim Care* 2016; 5:20-23.
- Sharma S, Singh M, Pal R, Ranjan R, Pal S, Ghosh A. National Health Policy 2017: Can it lead to achievement of sustainable development goals? *Al Ameen J Med Sci* 2018; 11(1): 4-11.

33. Pal R. Everything is learning. *Educ Health (Abingdon)* 2017; 29(3):271-2.
34. Saxena V, Kumar P, Kumari R, Nath B, Pal R. Availability of Village Health and Nutrition Day services in Uttarakhand, India. *J Fam Med Primary Care* 2015; 4: 251-256.
35. Pal R, Rustagi N. Food safety: Who's who. *J Med Nutr Nutraceut* 2015; 4: 27-31.
36. Pal R, Mohanta PK, Rustagi N, Sarbapalli D, Ghosh A, Sarker G. Knowledge is power if you hone it. *Int J Green Pharm* 2015; 9(2): 86-89.

Cite this article as: Ghosh A, Paul SK, Pal R, Pal S. Therapeutic diet for primary care. *Al Ameen J Med Sci* 2019; 12(1):37-43.

*All correspondences to: Dr. Swapan Kumar Paul, Assistant Professor, Department of Community Medicine, Mata Gujri Memorial Medical College & Lions Seva Kendra Hospital, Kishanganj-855107, Bihar, India. E-mail: drsk_paul@yahoo.co.in