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D.I.E.T- DIETARY INTERVENTION IN EDENTULOUS TREATED (PATIENTS WITH COMPLETE DENTURES) - A SYSTEMATIC REVIEW

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ABSTRACT

Background: Nutrition is the prime most factor for providing with the essential and the non-essential nutrients for a better overall health especially in the older individuals. This systematic review is to assess the role of nutrition in the patients wearing complete dentures.

Materials and Methods: A total of 69 articles were reviewed and assessed through various data bases online and offline for the effect of nutrition, their analysis and the instructions given for the new denture wearer to combat the deadly nutritional deficiency and its associated diseases.

Results: Only seven articles had any given instructions for the denture wearer, where none were pertaining to Indian Standards or the different varsities in the country.

Conclusion: A model has been devised and proposed pertaining to the diverse community for better understanding of the importance of the nutrition especially in the older section without teeth to maintain a healthy and a balanced life.

Keywords: Diet, nutrition, edentulous, health

1. INTRODUCTION

Nutrition is the modus operandi for providing adequate food components for health and growth subsistence, especially in old individuals, given their impediments and requirements **[1]**. For a person to be well-nourished, a healthy diet must be practiced **[2]**. Nutrients are further graded as necessary and non-essential, where sugars, proteins, fats, vitamins, vitamins, minerals and water are essential **[3]**. Diet and nutrition apply to basic protein, starch, lipid, nutrient, mineral, and water roles in the body and to the human dietary needs for these variables **[4]**. In terms of food decisions, the psychological and social aspect of a person often plays a central role in the choice of diet **[3]**. Various variables come into play, such as the right to select and the diversity of the personal and social life of an individual's food intake, budget preferences, atmosphere and cultural attitude **[5]**.

Dental wellbeing is in turn influenced by the systemic effects of nutrients that are determined by these food decisions **[6]**. Latest evidence shows that approximately one-third of those over 65 years of age are edentulous. Edentulism is thus a major concern, particularly for orally impaired persons, for their choice and availability of food **[7]**. In addition, the longevity and stability of this full denture prosthesis depends on the mucosal health of patients, which is determined by the type of food eaten by a person **[8]**. Edentulous people prefer to eat less protein and other foods, including fibers, carbohydrates, and some vitamins **[9]**. The decreased functional capacity to masticate thus affects dietary options with the risk of decreased nutritional status, especially in the use of complete dentures in fully orally impaired elderly individuals **[7]**. Additional dietary principles are enforced by geriatric nutrition and should not be combined with the overall stable and youthful population to address the consequences of ageing and sickness as well as to better control the physical, behavioral and psychosocial changes involved with senile age **[10]**.

Physiological changes such as diminished body structure with age (1-2 percent annual reduction in lean body mass and extracellular water decrease) and reduced organ function have tremendous effects on the elderly and their way of life **[9]**. In addition to these, mental difficulties, insufficient financing, inability to perform their own activities such as shopping or food planning, adherence to a particular diet, alcohol, often play an important role in the choice of food that a

person prefers, especially for the senile age **[3]**.

The goal of this systematic analysis is to examine the latest literature available for the dietary guidelines to be used for some time by denture wearers from the first time onwards and their impact on overall superior health. The study also aims to highlight the relevance and distinction of diet in denture wearer patients with such a wide range of dietary choices in different demographic regions around the world and especially in India.

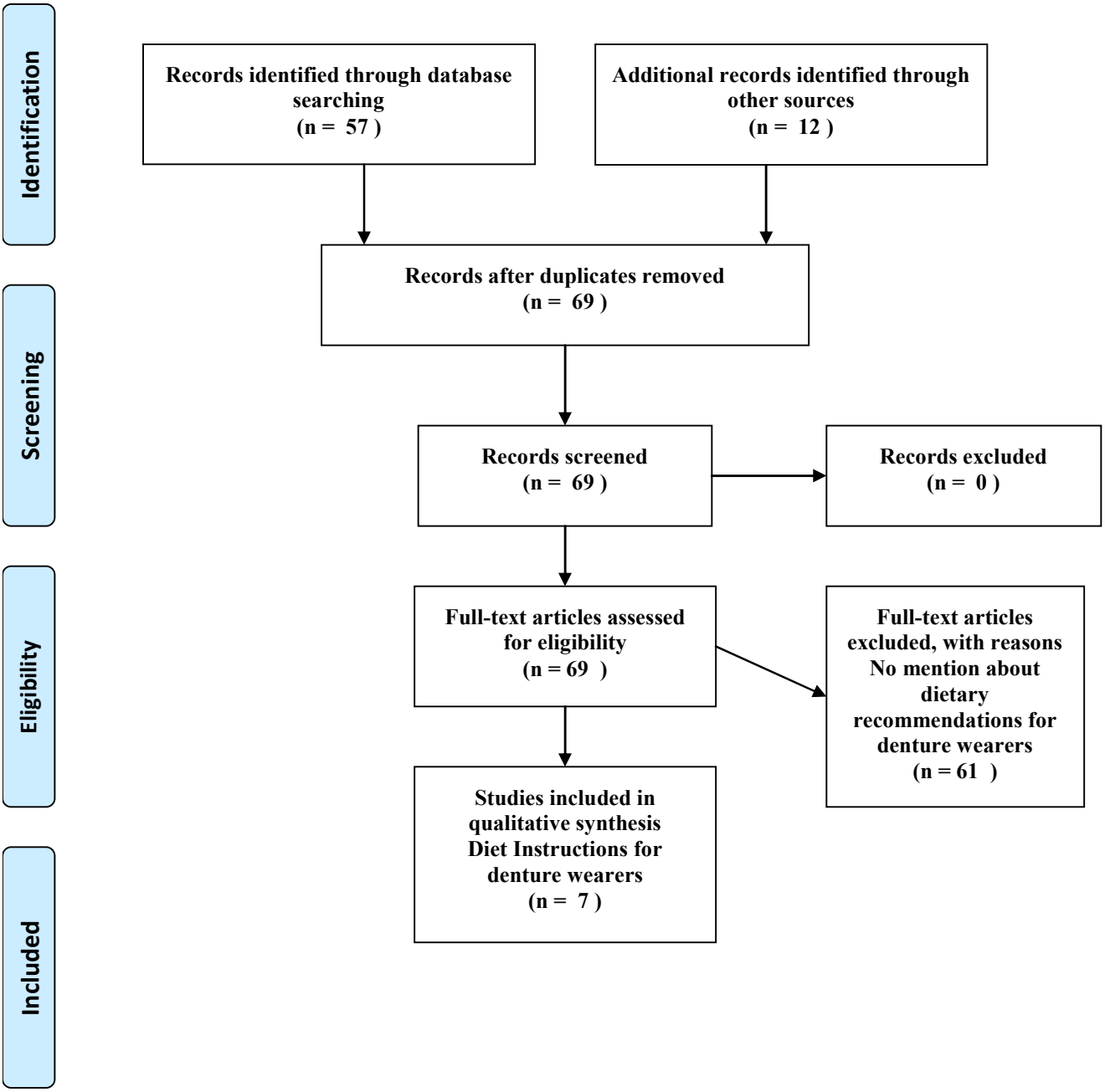
2. MATERIALS AND METHODOLOGY

In this review article, a total of 68 articles were reviewed which were exclusive in English Language.

Out of 68, 16 were published by Indian authors, from a total of 68, 40 were the assessment and 28 were review articles. Though about 38 articles had nutrient instructions for elderly individuals only 7 out of 68 had instructions for geriatric patients using dentures only with respect to western standards but none had and recommendation pertaining to Indian Standards considering the Indian population and their dietary needs.

In the enlisted **Table 1**, out of the viewed articles and data, only 7 articles were found to be of significant value in consideration to the dietary intake of completely edentulous patients. Out of the 68 articles reviewed, the 7 articles were restricted to the dietary instructions of newly complete denture rehabilitated patients with no consideration to the patients who were old denture wearers. On a nationwide search, none of these articles were pertaining to an Indian Diet or were exclusive to an international base.

PRISMA 2009 Flow Diagram



3. RESULTS

01	Indian- 17	International- 52
02	Review- 38	Assessment- 31
03	Geriatric Diet- 24	No- 45
04	General Diet- 47	Disease specific- 22
05	General Diet- 55	Specific Nutrient- 14
06	Denture Diet- 7	No- 62
07	Diet in new pts.- 7	Old pts.- 0
08	Western Denture Diet-7	Indian Denture Diet- 0

Table 1: Significance of each parameter used in accordance with the total number of articles

S. No.	Parameter	Chi square and p value
01	Ethnicity	X^2=17.75; p=.001
02	Article type	X^2=0.71; p=.399
03	Geriatric diet	X^2=6.39; p=.011
04	Specificity of Diet (Disease)	X^2=9.06; p=.003
05	Specificity of Diet (Nutrient)	X^2=24.36; p=.001
06	Denture Diet	X^2=43.84; p=.001
07	Diet in new patients	X^2=4.67; p=.031
08	Diet Ethnicity	X^2=4.67; p=.031

Table 2: Articles shortlisted under the inclusion and the exclusion criteria

S. No	Author	Year	Conclusion
01	Greska *et al*.	1995	Insufficient nutrition in patients without dentures
02	Shinkai *et al*	2002	Comparison of diet with patients with and without dentures
03	N Shah *et al*	2004	Comparison of dietary insufficiency of patients with edentulism
04	N Prakash et. al	2011	Evaluation of patient nutrition and instructions with dentures
05	Paturu *et al*	2012	Established periodic consultation of old denture patients for nutrition
06	Bandodkar *et al*	2017	Dietary instructions given for the new denture patients
07	Meenakshi *et al.*	2018	Dietary instructions given to the new denture patients

4. DISCUSSION

7.1 Aging and changing physiology:

1. Aging and the oral cavity:

Aging cells also have decreased functional ability, especially in the nervous and skeletal muscle systems. The impaired masticatory force and neuromuscular incoordination was expressed in the volumetric lean body mass subjects with a reduction of up to one-third by the age of 75 **[4]**. There is a substantial decrease in the number of radical taste buds in the form of the studies study on the lingual papillae and therefore the sense of taste of a person around 45years of age **[1]**.

The deleterious effect is further accelerated by age-related degeneration of the salivary glands and by fibrous invasion. It is well known that the water solubility of food as well as taste buds is the key factor responsible for the sensory stimulation of

taste receptors, so decreased salivary flow may decrease the level of satiety in the reception of taste **[11]** . In order to achieve a satisfactory response to sensory stimulus of food, a person resorts to different compensatory measures with decreasing age. Continuous development of residual ridge resorption, risks of osteoporosis, thinning of the oral epithelium and thinning of the oral epithelium at the same time as the loss of teeth and oral degeneration, which involves the decreased volume of saliva with the use of the denture, both biomechanical interferences in the use of full dentures further constitute degeneration or impeding neuromuscular coordination **[4]**. As a compensatory mechanism, the issues associated with dentures thus lead to detrimental changes in eating patterns **[12]**.

2. Inside the Gastrointestinal Tract Aging:

It happens in the midst of a highly compromised environment in the elderly during the transfer of food from the oral cavity to the digestive tract. Due to the reduced motility of the intestines, the bacterial flora appears to proliferate, especially in the elderly **[13]**.

The intestinal flora completes the preferential absorption of vital nutrients as the microorganisms are made available for food nutrients. The inadequacy of a healthy diet of either quantity or consistency only accentuates the dietary deficit of the host with such age-related shifts **[8]**.

The nutrient deficit in an elderly person is further enhanced by the persistent decline in the small intestine's absorptive potential due to the reduced rate of cell regeneration needed for successful absorption **[4]**. It determines the absorption of fat to a very high degree in understanding the mal-absorption of nutrients, which ultimately leads to a limited absorption of calcium **[10]**. The related diseases in other organs and the drop in the functioning part of an organism allow the individual to consume a concoction of different medications with age that inevitably helps to inhibit nutrient absorption and therefore nutritional deficiency **[14]**.

Alcoholism also enters into play past the age of 60, when it is projected that by lowering food consumption and nutritional absorption, it can have a cautious effect on up to a population of 10 percent **[14]**.

Nutritional status - Variables affecting **[1]**:

1. The nature and volume of food.
2. Meat absorption received (mastication and swallowing).
3. Digestion and absorption (malabsorption).
4. Requirement in terms of metabolism

7.2 Nutritionally connected oral issues in aged patients:

One of the major functions of organic process fitness is to inhibit or mitigate the onset of these aging-related chronic and disease problems that arise inside the mouth, ranging from the failure to detect taste, dry mouth due to impaired development of saliva, glossodynia, degeneration of the oral mucous membrane, irritation of the mandibular joint, periodontal disease and alveolar pathology **[2]**.

The goals should be prepared and accomplished, especially for the elderly, with a set of nutritional objectives for the advancement of the subjects concerned:

1) To build a diet that complies with the patient's physical, emotional, psychological and economic aspects **[9]**.
2) To offer and calculate temporary dietary adjuvant therapy aimed at particular purposes such as tooth decay management, surgery, etc. **[9]**.
3) To define criteria unique to the cohort of subjects in the dental plate that can influence and impede medical treatment in the organic phase **[9]**.

Treatment: Rehabilitation

In a person with oral paralysis, a five-fold treatment **[14]** scheme may be used:

1) A comprehensive medical practitioner's test.
2) Identification of agents for physical tissue acquisition.
3) Recommendation basic Nutritional.
4) Motivation.
5) Additional supplements to the diet.

For a person considering the various age criteria and the criteria, a Healthy DIET must be of utmost importance. For each category and in particular for the older individuals of 70 and plus age, the WHO has illustrated a different plate. To be counted as 65 years of our party region and above with edentulism, it becomes a requirement to have a statistically calculated healthy diet consisting of a balanced diet **[8]**.

- 4 or additional vegetable or fruit parts
- 4 minimum portions of whole-grain food for cereals
- 3 minimum milk or cheese servings
- 3 or additional meat portions or substitute protein foods
- 1 teaspoon of fat that is edible
- Six cups of water

A perfect concoction of vitamins, minerals, calcium, fiber, and water is prescribed for soup consumption. For individuals unable to ingest milk, dairy products and cheese are a perfect source for Calcium and Vit D **[1]**.

For a higher protein consumption, denture resistance is increased. It emphasizes 3 servings of protein foods a day and even the use of high-quality animal protein. While the energy requirement continues to decrease with age due to a drop in metabolic rate and even a reduction in physical activity, the demand for all nutrients remains the same **[10]**.

Indications for Supplementation: The low nutrient-to-calorie ratios of the frequently observed soft protein diet may favorably boost nutrition and mineral supplements **[15]**. Brin and Bauerfeind find that supplementing diets with multivitamins costs less than searching for mandatory foods to address dietary shortages **[15]**.

7.3 Nutrition for the patient denture:

A prize that has been the aim of humanity across all ages is ideal fitness. It must be recognized that good body health and good oral health should not be isolated. A body that is diseased also produces a diseased mouth, which, in turn, may lead to a diseased body **[7]**.

A healthy diet is a fundamental requirement. The tissues are unable to survive on food that is basically false. Since he puts what he considers good food in adequate quantities into his stomach, an individual will starve his body. The required vitamins and minerals must also be available, and so the body must be able to use certain products and nutrients properly **[16, 17]**.

Nutritional experts accept that the following components can be categorized into nutritional substances **[11]**:

1) Proteins.
2) Carbohydrates.
3) Fats.
4) Vitamins.
5) Minerals.
6) Water.

7.4 Nutrition for first time denture wearer:

If an associate is created in the Nursing study of the jaw motions concerned in mastication, the flexibility to control the physical quality of food is often easier for a replacement denture wearer to make **[8]**. Three measures are really included in the intake method: biting or incising; chewing or pulverizing and finally swallowing **[6]**.

Incising food requires a gripping and tearing operation by the tooth teeth involving broader mouth opening, which dislodges the dental plate until the leverage force of the incising action is exercised within the anterior process of the mouth, the only equivalent and opposite force to stop the denture from dislodging is that the seal

formed by the denture on the lip's post dam compressive force **[7]**.

Molars and bicuspids square assess chewing and pulverizing the bolus of the food more effectively than incising, but still, some encounters involve control of the various chew muscles that result in the hinge and slipping action of the mandibular during ingestion **[8]**.

Therefore, while the logical sequence of food consumption is biting, masticating and swallowing, it is much easier for the new dental plate patient to master this sophisticated reverse order of masticatory motions, namely, swallowing main, second chewing and last biting **[13, 14]**. As a consequence, foods of a consistency that will only need to be swallowed like liquids should be recommended for the primary a pair of days **[18]**.

For the next two days, the use of nostalgic foods is recommended and a solid or daily diet is always eaten by the end of the week **[19]** depicted in **Figure 1, 2**.

For the primary day, diet:

A replacement denture patient will have a diet on the primary post injection day that will contain fruit juices, yogurt, etc. **[7, 18]**

Second and Third Day Diets:

The patient may have soft food that requires a minimum of chewing, such as tender fried carrots, macaroni or pasta, condensed milk, disorganized or soft-cooked eggs **[19, 7]**.

Fourth day's diet and later:

In comparison to a diet, firmer foods are also consumed by the fourth day as currently because the sore spots have decent, in most situations, small products can be cut before consumption **[19, 7]**.

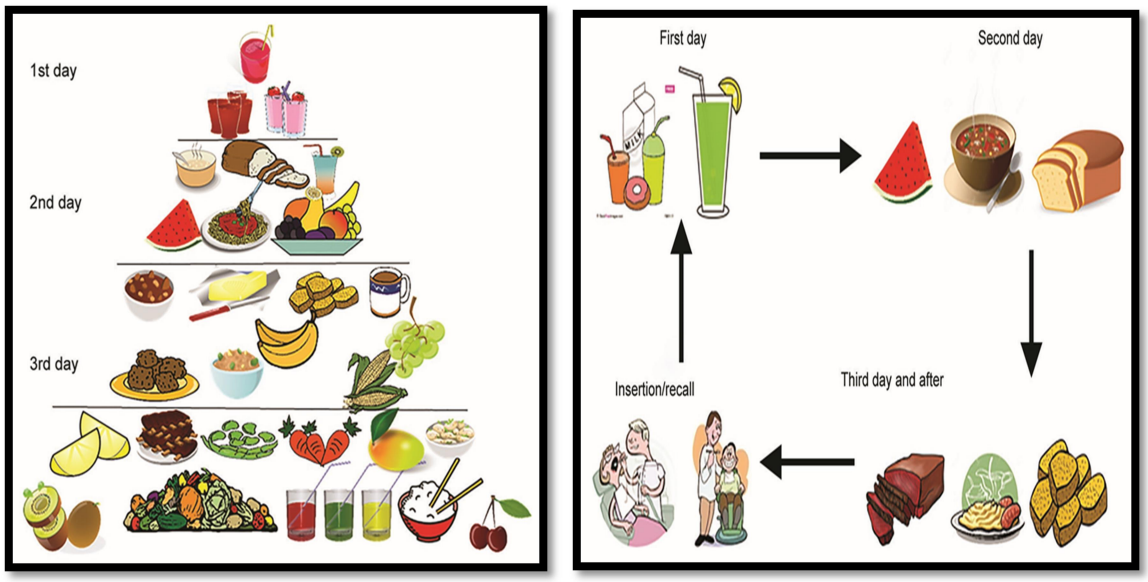


Figure 1 and 2: Pictorial Diagram for diet for denture patients

7.5 MENU PLAN [12]

Tea	**: 1 cup**	
Breakfast	**: Bread**	**- 1 slice with ½ tsp butter**
	Egg (Soft Boiled)	**- 1**
	Milk	**- 1 cup with sugar**
	Banana	**- 1 small**
Lunch	**: Chapati**	**- 1**
	Rice	**- ½ cup**
	Dal	**- 1 cup**
	Alu Palak	**- 1 cup**
	Curds	**- ½ cup**
	Orange Or Sweet Lime	**- 1**
Tea	**: Tea**	**- 1 cup**
	Biscuits	**- 2**
Dinner	**: Chapati**	**- 1**
	Rice	**- ½ cup**
	Mung Usal	**- 1 cup**
	Dudhi / Pumpkin Vegetables	**- 1 cup**
	Curds	**- ½ cup**
	Salads	**- Cooked beet, Carrot, Raw Onion, Cabbage**
Bedtime	**: Warm Milk**	**- 1 cup**

5. CONCLUSION:

With 65-74 as early elderly, over 75, late elderly, the new WHO grouping perceives persons over 60 as elderly. While the classification has been further updated by adding >80 as older adults, centennial as >100 and super centenarian as >110. We're obviously shifting the age to senile with the changing and advancing times. With this, it is important to take appropriate precautions for geriatric patients wearing dentures, in particular due to the various demographic habitats influencing their food preferences, since there will be little news on how diet influences the wearers of geriatric dentures and vice versa.

The proposed food menu relates to the denture wearer's diet, especially for the Indian community, making it simple.

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7. REFERENCES

[1] W. Leslie and C. Hankey, "Aging, Nutritional Status and Health," *Healthcare*, vol. 3, no. 3, pp. 648–658, 2015, doi: 10.3390/healthcare3030648.

[2] M. Yoshida, R. Suzuki, and T. Kikutani, "Nutrition and oral status in elderly people," *Jpn. Dent. Sci. Rev.*, vol. 50, no. 1, pp. 9–14, 2014, doi: 10.1016/j.jdsr.2013.09.001.

[3] L. P. Greksa and I. M. Parraga, "The dietary adequacy of edentulous older

adults," vol. 73, no. 2, pp. 142–145.

[4] S. Amarya, K. Singh, and M. Sabharwal, "Changes during aging and their association with malnutrition," *J. Clin. Gerontol. Geriatr.*, vol. 6, no. 3, pp. 78–84, 2015, doi: 10.1016/j.jcgg.2015.05.003.

[5] S. M. Phillips, "Nutrition in the elderly: A recommendation for more (evenly distributed) protein?," *Am. J. Clin. Nutr.*, vol. 106, no. 1, pp. 12–13, 2017, doi: 10.3945/ajcn.117.159863.

[6] N. Prakash, N. Kalavathy, J. Sridevi, and K. Premnath, "Nutritional status assessment in complete denture wearers," *Gerodontology*, vol. 29, no. 3, pp. 224–230, 2012, doi: 10.1111/j.1741-2358.2011.00620.x.

[7] K. Bandodkar and M. Aras, "Nutrition for geriatric denture patients," *J. Indian Prosthodont. Soc.*, vol. 6, no. 1, pp. 22–28, 2006, doi: 10.4103/0972-4052.25878.

[8] G. Singh, S. Quadri, B. Kapoor, and S. Rathi, "Effect of nutrition in edentulous geriatric patients," *J. Oral Res. Rev.*, vol. 10, no. 1, p. 33, 2018, doi: 10.4103/jorr.jorr_20_17.

[9] J. Shlisky *et al.*, "Nutritional considerations for healthy aging and reduction in age-related chronic disease," *Adv. Nutr.*, vol. 8, no. 1, pp. 17–26, 2017, doi: 10.3945/an.116.013474.

[10] Y. Zou and D. Zhan, "Očekivanje i zadovoljstvo pacijenata totalnom zubnom protezom pre i posle terapije," *Vojnosanit. Pregl.*, vol. 72, no. 6, pp. 495–498, 2015, doi: 10.2298/VSP140229002Z.

[11] N. R. Sahyoun, C. L. Lin, and E. Krall, "Nutritional status of the older adult is associated with dentition status," *J. Am. Diet. Assoc.*, vol. 103, no. 1, pp. 61–66, 2003, doi: 10.1053/jada.2003.50003.

[12] N. Shah, H. Parkash, and K. R. Sunderam, "Edentulousness, denture wear and denture needs of Indian elderly - A community-based study," *J. Oral Rehabil.*, vol. 31, no. 5, pp. 467–476, 2004, doi: 10.1111/j.1365-2842.2004.01260.x.

[13] J. L. Wells and A. C. Dumbrell, "Nutrition and aging: assessment and treatment of compromised nutritional status in frail elderly patients.," *Clin. Interv. Aging*, vol. 1, no. 1, pp. 67–79, 2006, doi: 10.2147/ciia.2006.1.1.67.

[14] S. Maggini, A. Pierre, and P. C. Calder, "Immune function and micronutrient requirements change over the life course," *Nutrients*, vol. 10, no. 10, 2018, doi: 10.3390/nu10101531.

[15] E. Ward, "Addressing nutritional gaps with multivitamin and mineral supplements," *Nutr. J.*, vol. 13, no. 1, pp. 1–10, 2014, doi: 10.1186/1475-2891-13-72.

[16] Y. Su, M. Yuki, K. Hirayama, M. Sato, and T. Han, "Denture wearing and malnutrition risk among community-dwelling older adults," *Nutrients*, vol. 12, no. 1, pp. 1–12, 2020, doi: 10.3390/nu12010151.

[17] P. Sutariya, D. S. Mehta, D. H. Shah, D. V. Shah, D. V. Karia, and D. T. Goyal, "A A Systematic Review on Impact of Edentulism on Nutritional Status of Eldrly Adults as Compared to Dentulous Adults," *J. Curr. Med. Res. Opin.*, vol. 3, no. 11, pp. 739–748, 2020, doi: 10.15520/jcmro.v3i11.368.

[18] R. Paturu, P. T. Veeravalli, A. K. Vaidyanathan, and M. Grover, "Evaluation of nutritional status and eating pattern in first and second-time denture wearers: A prospective 60 days (2 months) pilot study," *J. Indian Prosthodont. Soc.*, vol. 11, no. 3, pp. 156–164, 2011, doi: 10.1007/s13191-011-0080-y.

[19] M. S. Iyer, S. Madarapu, and K. R. Swamy, "Geriatric Nutrition in Denture Wearers: Revisited," *J. Oral Heal. Community Dent.*, vol. 12, no. 2, pp. 47–50, 2018, doi: 10.5005/jp-journals-10062-0025.