

Awareness of clinical application of vitamin E among dental students.

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ABSTRACT:

BACKGROUND: Vitamin E is a major cutaneous, non-enzymatic antioxidant, scavenging free radicals generated through a variety of mechanisms leading to skin pathology. Vitamin E is also anti-inflammatory as demonstrated in numerous animal models. Only two forms of vitamin E exist in the body: α -tocopherol and γ -tocopherol. Both occur in abundance within the stratum corneum after their secretion by sebaceous glands. The increased density of vitamin E within the stratum corneum preserves the integrity and barrier function of the skin while protecting the most superficial cutaneous layer from oxidation. Supplementation of vitamin E, orally or intravenously, has been shown to reach the outermost portions of the skin and does so within two weeks of supplementation. The aim of the study was to evaluate and compare the awareness of clinical application of vitamin E among dental students. A cross sectional survey was carried among 100 dental practitioners using a questionnaire. Questionnaire contained 10 questions on awareness of clinical applications of vitamin E among dental students. The data were extracted and analysed. In conclusion, the availability of very sensitive methods for measuring concentrations of fat-soluble vitamins has made it feasible to examine these vitamins in small plasma samples from preterm infants. Although the usage of dietary supplements of vitamin E is high in students, there is a dearth of knowledge, especially regarding the role of micronutrients in health and disease.

KEYWORDS: Vitamin.E, antioxidants, peroxidase enzyme, lipids, ataxia, haemolytic anaemia etc.

1. INTRODUCTION:

The fat-soluble vitamin E was discovered in 1922 and was proved to play a role in causing hemolytic anaemia in premature infants in 1967, [1-2] even though they did not need vitamin E supplement. Vitamin E deficiency is usually a result of defective uptake rather than insufficient intake due to its abundance in vegetables, nuts, dairy products, meat and fish. [3-4] In the 1970s it was shown that vitamin E is an antioxidant essential for maintenance of normal neurological structure and function. This was studied in abetalipoproteinemia with defective absorption of lipids and thereby fat-soluble vitamins due to absence of chylomicra, responsible for intestinal absorption, and lack of low-density lipoprotein and very-low-density lipoprotein, necessary for transporting of fat. [5-7] Patients with vitamin E deficiency due to malabsorption usually present with neuropathy. [8]

Ataxia with vitamin E deficiency is an autosomal recessive neurodegenerative disorder. The clinical features resemble those of Frederick's ataxia with cerebellar ataxia, loss of deep tendon reflexes, vibratory sense disturbances, dysarthria, and Babinski sign. Head titubation, retinopathy and dystonia are more common in patients with AVED

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while cardiomyopathy, glucose intolerance, scoliosis and foot deformities in Friedreich ataxia. The principal diagnostic criteria of AAVED are Friedreich ataxia like neurologic phenotype in association with markedly decreased plasma vitamin E concentration in the absence of known cause of malabsorption.[9]

Ataxia is incoordination of movement or inability to move smoothly. Disorders affecting cerebellum, brainstem, dorsal columns and the vestibular system might present with ataxia. The etiology might be hereditary, sporadic or secondary to other diseases. Hereditary ataxias are classified according to mode of inheritance; autosomal dominant, autosomal recessive or x-linked. The autosomal dominant ataxias might present as progressive disorders or episodic ataxias. The progressive forms are also named spinocerebellar ataxias (SCA) and numbered in the chronological order they were described [10-13] Ataxias with autosomal recessive inheritance include more common forms like Friedreich ataxia, ataxiatelangiectasia and ataxia with vitamin E deficiency (AAVED). Most of the ataxias are progressive, untreatable disorders but it is important to actively search for the treatable causes such as vitamin E deficiency, Refsum disease, coenzyme Q10 deficiency and cerebrotendinous xanthomatosis.

Vitamin E is a major cutaneous, non-enzymatic antioxidant, scavenging free radicals generated through a variety of mechanisms leading to skin pathology [14-16] Vitamin E is also anti-inflammatory as demonstrated in numerous animal models Only two forms of vitamin E exist in the body: α -tocopherol and γ -tocopherol. Both occur in abundance within the stratum corneum after their secretion by sebaceous glands. The increased density of vitamin E within the stratum corneum preserves the integrity and barrier function of the skin while protecting the most superficial cutaneous layer from oxidation Supplementation of vitamin E, orally or intravenously, has been shown to reach the outermost portions of the skin and does so within two weeks of supplementation. [17-18]

The current standard for psoriatic therapy does not capitalize on the proposed protective mechanisms of vitamin E, but several studies have shown vitamin E efficacy in psoriasis. An animal study showing the topical application of methanolic extract of *Andrographis nallamalayana* on psoriatic lesions showed alleviation of symptoms within 12 days. The extract contains α -tocopherol among other natural chemicals [19] A case report detailed the efficacy of nutritional supplementation and diet manipulation without concomitant standard psoriasis treatment in a 36-year old female with psoriasis.

One major form of incidental vitamin E supplementation in the diet is through olive oil. Numerous studies have determined a high content of tocopherols in olive oils through various methods of extraction [20-22]. Dietary olive oil supplementation in mouse models has provided promising anti-inflammatory results. One model fed mice extra virgin olive oil prior to arthritis induction with type II collagen.

Compared to healthy newborns, premature infants have low plasma concentration of retinol, 25-hydroxyvitamin D and vitamin E at birth, reflecting that fetal accumulation of these vitamins mainly takes place in the last trimester of pregnancy. Diet and nutrition play a key role in the maintenance of good health and prevention of disease. While a well-balanced diet aims at providing the essential nutrients, the role of dietary supplements in complementing the diet cannot be undermined. Dietary supplements represent an important source of essential nutrients and may confer various health benefits, including chronic disease prevention [22]. However, wide usage of supplements is often a cause for concern because of potential adverse effects like neurologic disturbances, gastrointestinal symptoms, hepatotoxicity, birth defects and drug interactions. [23]

2. MATERIALS AND METHODS:

Participants and study design:

It is a questionnaire-based survey study was conducted at the Saveetha Dental College and hospital. The subjects of the study were dental students who are in their undergraduate years in the Saveetha Dental College and Hospital. The students were informed in advance about the objective of the study and identities were kept anonymous.

3. Data Collection Methods:

This study was conducted to assess the responses of 10 selected questions related to herbal mouthwash among 100 dental students through a survey planet. A Questionnaire was self-constructed about the knowledge and awareness toward herbal mouthwash. The questionnaire was developed to gain information on knowledge and awareness of vitamin E among dental students. After excluding the incomplete responses, the results were recorded and analyzed.

1)What is the role of vitamin E in the oral cavity?

- A.) Increase immunity
- B.) Increase cytotoxicity
- C.) prevents Oral cancer
- D.) Don't know

2.) Foods available in Vitamin E deficiency?

- A.) Eggs
- B.) Fish
- C.) meat
- D.) Don't know

3.)What are the drug supplements for vitamin E deficiency?

- A.) Aquasol E
- B.) Alpha-tocopherol
- C.) Tocopherol.
- D.) Don't know

4.)Normal range for vitamin E for adults is ?

- A.)12mg per day
- B.)15 mg per day
- C.)10 mg per day
- D.)Don't know

5.)Normal dosage of vitamin E for children under age of 1 to 3 years is ?

- A.)1mg per day
- B.)2.3mg per day
- C.)3.6mg per day
- D.)Don't know

6.) what are the foods that take part in vitamin E deficiency?

- A.) Carrot
- B.) peanut
- C.)Beatroot
- D.) Don't know

- 7.) Vitamin E deficiency leads to?
- A.) Gingivitis
 - B.) Periodontitis
 - C.) Chronic pancreatitis
 - D.) Don't know
- 8.) Did food intake will play a major role in vitamin E?
- A.) Yes
 - B.) No
- 9.) Did vitamin E supplements affect other medication?
- A.) Yes
 - B.) No
- 10.) Did vitamin E supplements cause side effects?
- A.) Yes
 - B.) No

4. RESULTS AND DISCUSSION:

Awareness of dental students related to clinical applications of vitamin E was evaluated by assessing the first set of questions; Only 35% of dental students aware that role of vitamin E in oral cavity increases immunity and 30% of them says that role of vitamin E in oral cavity increases cytotoxicity and 25% of them aware that vitamin E prevents oral cancer in oral cavity and 10% of them not aware that role of vitamin E in oral cavity [Figure 1]. As for the second question 25% of them aware that egg yak will prevent vitamin E deficiency while 35% of them says that fish will prevent vitamin E deficiency and 26% of them told that meat will prevent vitamin E deficiency and 14% of them not aware of the prevention of vitamin E deficiency [Figure 2]. The third question gives the awareness of students on the drug supplements in vitamin E deficiency 35% of them aware that aquasol E is the drug supplements of vitamin E deficiency and 34% of them says that alpha tocopherol is the drug supplements of vitamin E deficiency, and only 20% of them replies that tocopherol is the drug supplements of vitamin E deficiency and 11% of them not aware of drug supplements of vitamin E deficiency [Figure 3]. While the fourth question gives the knowledge of the students on normal range of vitamin E in adults; about 55% of them aware that normal range of vitamin E in adults is 12mg/day and 25% of them says that 15 mg/day is the daily requirement of normal range of vitamin E deficiency in adults and only 10% of them says that normal range of vitamin E in adults is 10mg/day and 10% of students are not aware of the normal range of vitamin E deficiency in adults [Figure 4]. According to the fifth question students responds for normal dosage of vitamin E in children under the age of 1 to 3 years; more than 56% of students aware that normal dosage of vitamin E for children under age of 1 to 3 years is 3.6mg/day and 23% of students says that 2.3 mg/day is the normal dosage of vitamin E for children under age of 1 to 3 years, and 11% of that normal dosage of vitamin E for children under age of 1 to 3 years and 10% of them are not aware of the normal dosage of vitamin E for children [Figure 5].

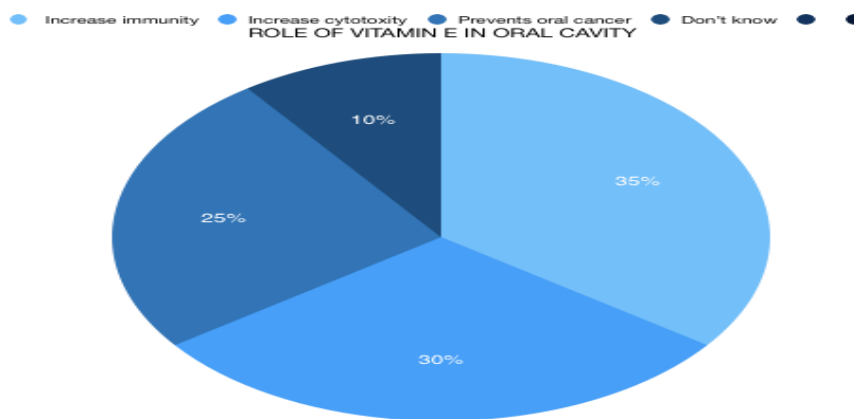


Figure 1: Pie chart represents the role of vitamin E in oral cavity, among 35% of dental students aware that role of vitamin E in oral cavity increases immunity while 30% of them says that role of vitamin E in oral cavity increases cytotoxicity and 25% of them aware that vitamin E prevents oral cancer in oral cavity and 10% of them not aware that role of vitamin E in oral cavity.

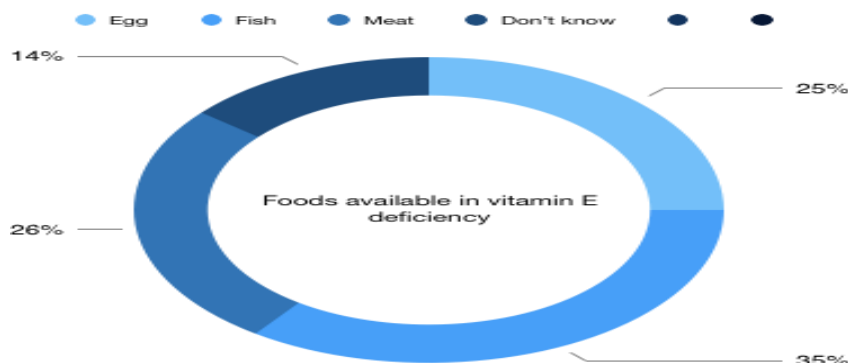


Figure 2: Pie chart represents the foods available in vitamin E deficiency only 25% of them aware that egg yak will prevent vitamin E deficiency and 35% of them says that fish will prevent vitamin E deficiency and 26% of them told that meat will prevent vitamin E deficiency and 14% of them not aware of the prevention of vitamin E deficiency.

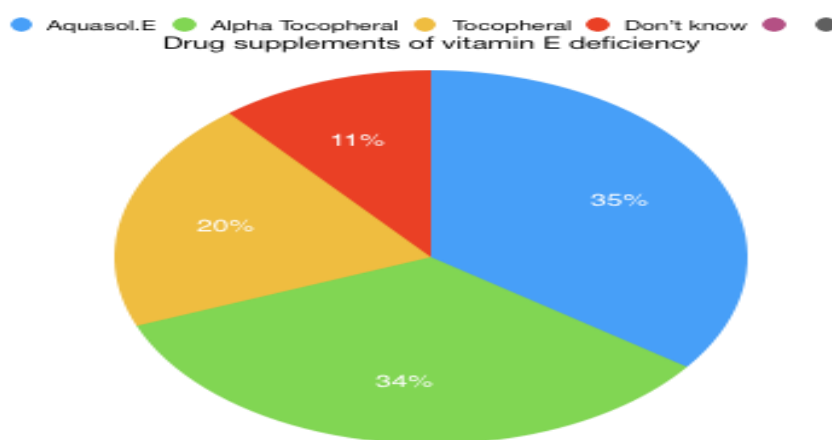


Figure 3: Pie chart represents the drug supplements of vitamin E deficiency among 35% of dental students aware that aquasol.E is the drug supplements of vitamin E deficiency and 34% of them says that alpha tocopheral is the drug

supplements of vitamin E deficiency, and only 20% of them replies that tocopherol is the drug supplements of vitamin E deficiency and 11% of them not aware of drug supplements of vitamin E deficiency.

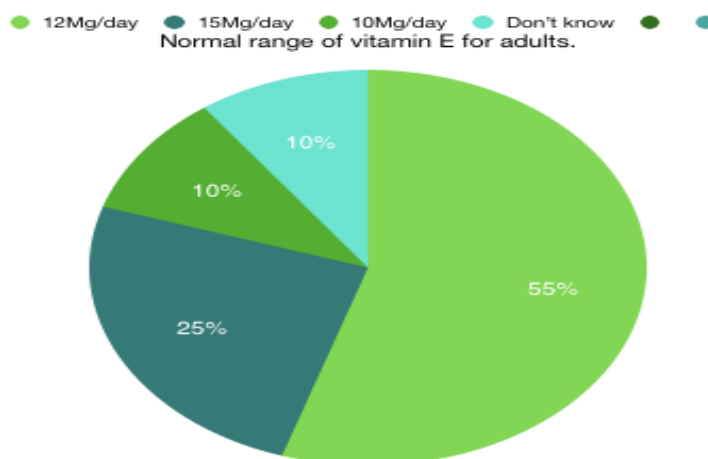


Figure 4: Pie chart represents the normal range of vitamin E in adults among the respondents 55% of them aware that normal range of vitamin E in adults is 12mg/day while 25% of them says that 15 mg/day is the daily requirement of normal range of vitamin E deficiency in adults and only 10% of them says that normal range of vitamin E in adults is 10mg/day and 10% of students are not aware of the normal range of vitamin E deficiency in adults.

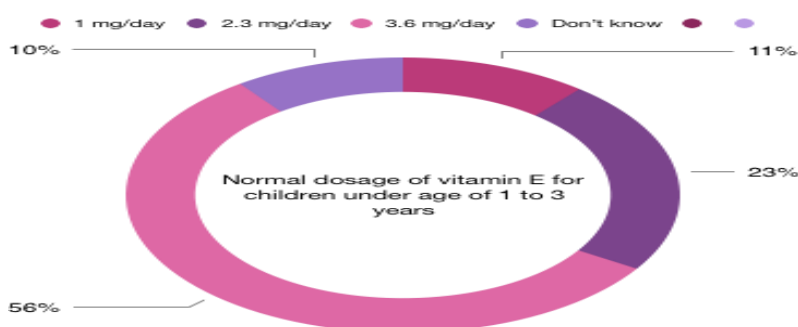


Figure 5: Pie chart represents the normal dosage of vitamin E for children under age of 1 to 3 years, among the respondents 56% of dental students aware that normal dosage of vitamin E for children under age of 1 to 3 years is 3.6mg/day while 23% of students says that 2.3 mg/day is the normal dosage of vitamin E for children under age of 1 to 3 years, and 11% of that normal dosage of vitamin E for children under age of 1 to 3 years and 10% of them are not aware of the normal dosage of vitamin E for children.

The sixth question gives the awareness of the students towards the foods that take part in vitamin E deficiency; among the respondents 42% of students aware that peanut is the major food that will take part in vitamin E deficiency and 26% of them says that beetroot will take part in vitamin E deficiency and 25% of them responds that Carrot will take part in vitamin E deficiency and more than 7% of them not aware of the foods that will take part in vitamin E deficiency [Figure 6]. As the seventh question gives the causes of vitamin E deficiency in dental students; among the respondents 35% of dental students aware that periodontitis may leads to cause vitamin E deficiency and 29% of them says that gingivitis may leads to cause vitamin E deficiency and more than 28% of them says that chronic pancreatitis may leads to cause vitamin E deficiency and only 8% of them says that they are not aware of the causes of

vitamin E deficiency [Figure 7], while the eighth question says that food intake will play a major role in vitamin E deficiency; 70% of them respond that food intake will play a major role in vitamin E deficiency and 30% of the dental students say that food intake will not play a major role in vitamin E deficiency as it is represented as dichotomies question in [Figure 8]. Ninth question gives the knowledge of dental students towards medication for vitamin E supplements; among the respondents more than 88% of dental students say that intake of vitamin E supplements does not affect any other medication while 12% of them acknowledge that intake of vitamin E supplements will lead to affect other medications as it is represented as dichotomies question in [Figure 8].

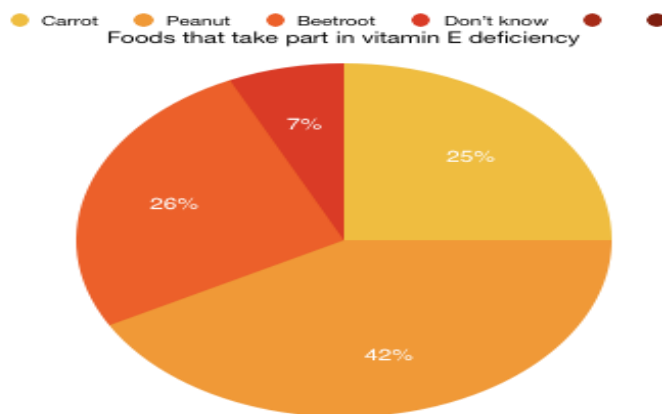


Figure 6: Pie chart represents the foods that take part in vitamin E deficiency among the respondents 42% of dental students aware that peanut is the major food that will take part in vitamin E deficiency while 26% of them says that beet root will take part in vitamin E deficiency and 25% of them responds that Carrot will take part in vitamin E deficiency and more than 7% of them not aware of the foods that will take part in vitamin E deficiency.

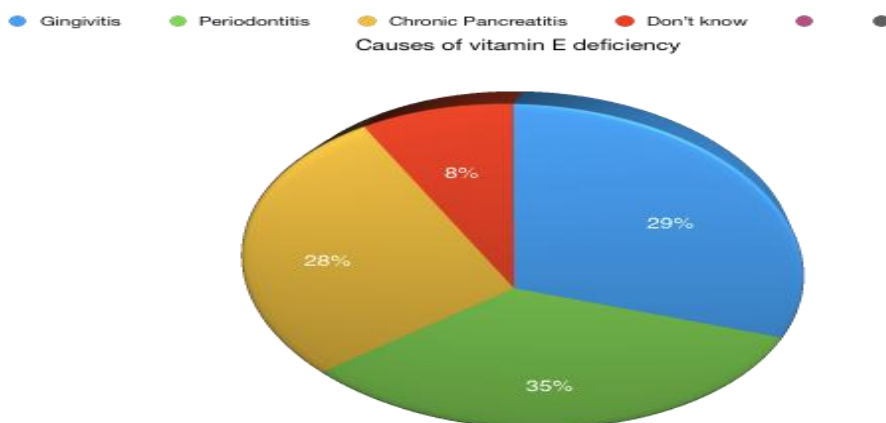


Figure 7: Pie chart represents the causes of vitamin E deficiency among the respondents 35% of dental students aware that periodontitis may lead to cause vitamin E deficiency while 29% of them says that gingivitis may lead to cause vitamin E deficiency and more than 28% of them says that chronic pancreatitis may lead to cause vitamin E deficiency and only 8% of them says that they are not aware of the causes of vitamin E deficiency.

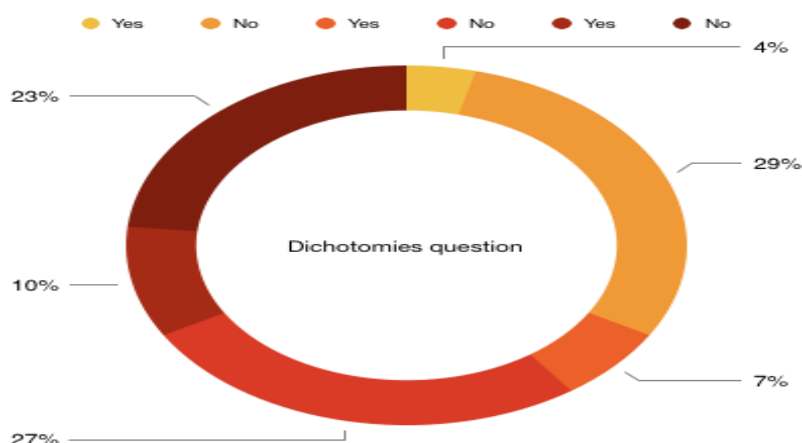


Figure 8: Pie chart represents the dichotomies questions of the survey among the respondents 88% of dental students says that intake of vitamin E supplements does not affect any other medication and only 20% of them says that intake of vitamin E supplements leads to cause side effects and more than 70% of them respond that food intake will plays a major role in vitamin E deficiency.

And the tenth question gives the knowledge of dental students towards side effects of vitamin E supplements; only 20% of them says that intake of vitamin E supplements leads to cause side effects and the remaining 80% of the dental students denied it as it is represented as dichotomies question in [Figure 8].

One major form of incidental vitamin E supplementation in the diet is through olive oil. Numerous studies have determined a high content of tocopherols in olive oils through various methods of extraction [24]. Dietary olive oil supplementation in mouse models has provided promising anti-inflammatory results. One model fed mice extra virgin olive oil prior to arthritis induction with type II collagen.

Vitamin E is the major lipid-soluble antioxidant in the cellular defence system and is exclusively obtained from the diet. Lack of research, especially for long term use, on excessive amounts of vitamin E prevents the establishment of toxic levels; however, vitamin E is relatively safe even in amounts above the recommended dietary allowance (RDA). Because vitamin E is widely distributed in foods, dietary deficiencies seldom occur if a well-balanced varied diet is consumed. Muscle and neurological problems are also a consequence of human vitamin E deficiency. Early diagnostic signs of deficiency include leakage of muscle enzymes such as creatine kinase and pyruvate kinase into plasma, increased levels of lipid peroxidation products in plasma, and increased haemolysis.

Vitamin E has been found to be very effective in the prevention and reversal of various disease complications due to its function as an antioxidant, its role in anti-inflammatory processes, its inhibition of platelet aggregation and its immune enhancing activity.

This study was conducted with the objectives of assessing awareness of Vitamin E towards dental students. In this study we find that knowledge regarding different functions, sources and supplements of Vitamin E is adequate but not excellent among dental students. In this study more than 90% of dental students are aware that the role of vitamin E in oral cavity increases immunity, increases cytotoxicity, prevents oral cancer in oral cavity and 10% of them are not aware of that role of vitamin E in oral cavity. 86% of them are aware that egg yolk, fish and meat will prevent vitamin E deficiency and 14% of them are not aware of the prevention of vitamin E deficiency. 89% of them are aware that aquasol E, alpha tocopherol and tocopherol are the drug supplements of vitamin E deficiency and 11% of them are not aware of drug supplements of vitamin E deficiency. 92% of dental students are aware that periodontitis, chronic

pancreatitis may lead to vitamin E deficiency and only 8% of them say that they are not aware of the causes of vitamin E deficiency. On all over analysis 72% of the students are aware of Vitamin E supplements and its deficiency.

5. CONCLUSION:

In conclusion, the availability of very sensitive methods for measuring concentrations of fat-soluble vitamins has made it feasible to examine these vitamins in small plasma samples from preterm infants. Although the usage of dietary supplements of vitamin E is high in students, there is a dearth of knowledge, especially regarding the role of micronutrients in health and disease. Hence, it is crucial that this information be highlighted in the health sciences curriculum with the objective of producing well informed professionals who can later on have a positive impact on the health of society. The students of Saveetha dental college has moderate awareness of vitamin E and its clinical application. Henceforth the students should attend CDE programs, workshops, and conducting surveys can improve their awareness of vitamin E and its clinical application.

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