Knowledge and Consumption of Dietary Supplement among Medical Students

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Abstract— A cross-sectional study design was selected. The population selected for this research was medical students (DPT & MBBS). The data was collected from the Isra Institute of Rehabilitation Sciences, Ziauddin University and Dow University of Health Sciences. The sample was selected through non-probability convenient sampling technique. 200 undergraduate medical students of MBBS and DPT. Medical students were chosen. The questionnaires were distributed in different medical institutes after the approval from the ethical review committee of Isra University. The results of this investigation study clarify that there was good prevalence of dietary supplement use among 79% of medical college students. Knowledge about the dietary supplements found very good in 56% of medical students, but most popular dietary supplements belonged to the categories of "Vitamins" and/or"Minerals" not providedwith correct knowledge. However, 1.5% of the students were marked to have very poor knowledge.

Key Words — Knowledge, Consumption, Dietary Supplement, Medical Student

1 INTRODUCTION

The knowledge is basically the understanding of objects and procedures. In other words, it is the network of faiths.Psychologists has differentiated two key kinds of knowledge: (a) Declarative knowledge: cognizance of things and tactics. (b) Procedural knowledge: expertise about how-to carryout things.Knowledge facilitates us to explain for essential elements of the arena and offers predictability to activities. (1)The dietary supplements providing any combination of following: vitamins, minerals, amino acid, herbs or botanicals and metabolites. They're commonly present in a form of pills, capsules, powered and tablets. Dietary supplements mainly used to increase the quality of life by preventing from many diseases and deficiencies. (2)Vitamins are organic catalysts involved in metabolic reactions. They are required in minimal quantity and are not utilized in the metabolic reactions. Although, they are deteriorated or metabolized like any biological molecule and must take place on a definite pattern to retain in body stores. Various vitamins are in a provitamin form in foods and are transformed to active form in the body. (3) It consists of vitamin A (retinol), D (calciferol), E (tocopherol) and K. Fat soluble vitamins are intently involved in the processes of antioxidation, blood coagulation, and calcium/phosphorus uptake within the human frame.(4)

It is compulsory for life and general health. Vitamin A is mainly significant for healthy eyes, lungs, bones, skin and immune system. (5)

Vitamin D or calciferol is associated with the general fitness of bone, skin and the immune response. (6) The chief lipid-soluble antioxidant vitamin E mainly found within the phospholipid bilayer of plasma membrane. (7) The vitamin K is necessary for all the functions of multiple proteins within the body that is coagulation factors (II, VII, IX, X and protein C and protein S), osteocalcin (a bone-forming protein) (8)

Water-soluble vitamins are group of organic compounds having different structure from each other but sharing the same characteristics of being important for normal cellular role, formation and improvement. Even though they exist in minute portions inside the food and play fundamental roles in preserving regular metabolic, strength, differentiation and growth fame of cells. (9)

Vitamin B1 is also called as thiamine, thiamin, and aneurine. (10) The thiamine preserved in the liver which may retain till 18 days. It assists the body to transform the carbohydrates, fat, and protein into energy. It is also necessary for appropriate regulations of the central and peripheral nervous system. (11)

Vitamin B2 is a water-soluble and heat-stable vitamin which utilized to breakdown fat, carbohydrate and protein and converts them into glucose for energy.(12)Niacin as a vitamin used as a supply of the *NAD*+ and NADP+ coenzymes needed for several metabolic reactions. (13)

Vitamin B5 is important in nearly all kinds of life. It is important for the formation and subsistence of CoA, a cofactor and acyl group carrier for many enzymatic functions, and acyl carrier protein, a component of the fatty acid synthase complex. (14)

The importance function of vitamin B6 is in mental formation and processing is well-known. (15)

Vitamin B12 also known as cobalamin, which plays a significant role in DNA formation and nervous system function.(16)

Vitamin C is a powerful antioxidant. Hence it defends against free radicals. AA is important micronutrient need to maintain the physiological processes of particular animals, along with some fish. (17)

According to a study there are twenty different types of minerals required to maintain normal function of body. (18) The calcium is present in the body about 99%, mainly found in bones and teeth.The remaining found in blood, extracellular fluid, muscles, and other tissues, where it serves as mediator for vascular contraction and vasodilation, muscle contraction, nerve transmission, and glandular secretion. (19)

Phosphorusis found in most of the body fluids and work as nucleic acid formation, ATP formation and enzymes. (20)Potassium is also an important dietary supplement. These positive ions are present in large quantity in intracellular fluid, where it plays a vital role in regulating cell function, mainly in excitable cells as like muscles and nerves. (21)Sulphur is important for better growth and development of living organisms by served as breaking down, and regulation functions.(22) Chloride is a negative charge inorganic ion present in extracellular fluid,

significant for homeostasis of fluid and electrolytes and also an important element of stomach acids. The adequate concentrated form is present in GI secretions and CSF.(23)The term “trace components” is used for those compounds present in naturally environments in small amounts.(24) Copper plays a vital role in our metabolism mainly because it enables numerous crucial enzymes to function efficiently.(25) Iron is biologically vital element of every living organism. In the human, iron chiefly present in complex forms combine to protein (hemoprotein) as heme elements (hemoglobin or myoglobin), heme enzymes, or non-heme compounds (flavin-iron enzymes, transferring, and ferritin). The iron is necessary for numerous cellular functions. (26) The human body occupied 2-3gram of zinc. And approximately 90% of zinc is present in muscle and bones. (27)Iodine is a micronutrient that is vital for the synthesis of thyroid hormones. (28) In same year 2017 a study was regulated by Etsuko Kobayashi et al. to clarify the frequency of dietary supplement consumption among college students aged between 18 to 24 years old in japan. The result shows the frequency of dietary supplement consumption did not vary remarkably between males and females but it increases according to academic year. (29) In the year 2015 Gity Sotoudeh et al. intended to regulate the occurrence of nutritional supplement-usage and its association with demographics and lifestyle of medical students. The assumption specifies that the nutritional supplement-usage among medical student, particularly among women, was comparatively very common. Nutritional supplement-usage was associated to an improved lifestyle. (30)

2 METHODOLOGY

A cross-sectional study design was selected. The population selected for this research was medical students (DPT & MBBS). The data was collected from the Isra Institute of Rehabilitation Sciences, Ziauddin University and Dow University of Health Sciences. The sample was selected through non-probability convenient sampling technique. Two hundrad undergraduate medical students of MBBS and DPT.

2.1 Figures

Figure-I: Consumption of dietary supplements by medical students in past one-year

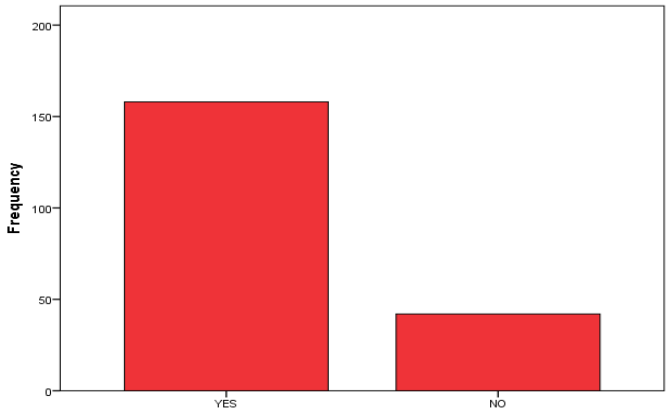


Figure-II: Knowledge

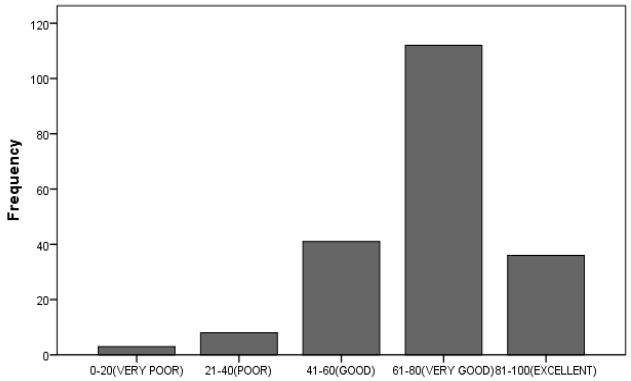
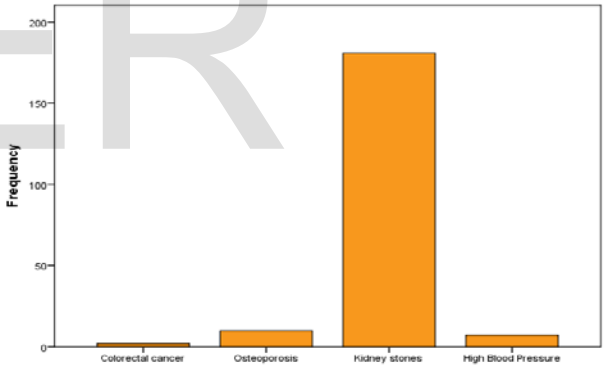


Figure: III: Excessive intake of calcium places one at risk of



3 RESULT

The frequency of consumption, of dietary supplements by medical students in past one-year can be seen in the table IV-6 which shows that n=158 (79%) consuming DS’s whereas, n=42 (21%) participants did not used any supplements.

The responses the section on knowledge was given scores. The collective score from all the questions on this section was converted to a percentage as shown in Table IV-31, n=3 (1.5%) of the students considered as “very poor” knowledge, about n=8 (4%) knowledge is “poor”, n=41 (20.5%) knowledge categorized as “good”, knowledge of n=112 (56%) students were “very good”, and whereas, n=36 (18%) of medical student’s knowledge considered as “excellent”.

This table represents supplement deficiency manifests as easily bruising and bleeding, results showed “Vitamin A” n=11 (5.5%), “Vitamin D” n=3 (1.5%), “Vitamin E” n=8 (4%) and “Vitamin K” is manifested by n=178 (89%).

"Excessive Intake of calcium places one at risk of?" n=2 (1%) "Colorectal cancer", n=10 (5%) "Osteoporosis", n=181 (90.5%) "Kidney stones", n=7 (3.5%) signify "High blood pressure".

5 DISCUSSION

This study revealed the prevalence of dietary supplement intake levels among the 200 medical students. The previous study among the Korean adults was carried out which illustrated that, around one-fourth of the participants are the users of dietary supplements. (31)In contrast to the results of this study, approximately 79% undergraduate's student denoted that they are consuming the dietary supplements or took dietary supplements over the previous 12 months.

The earlier survey reported that there is a higher rate of multivitamins supplements consumption among the medical students (32). In comparison, this study found that, the most common dietary supplement was multivitamins with the frequency of 17% among the medical students. The previous multivariate examination explored the factors related with awareness and knowledge about the folic acid supplements among the non-pregnant Korean females, the results showed, about 67% of females stated that they had heard of folic acid, and 23.7% had knowledge of both the role of folic acid in avoiding birth imperfections and suitable time for taking folic acid supplements to avoid birth imperfections. Though, only 9.4% of females took folic acid supplements at the time of the investigation. Females aged 19-24 years, unmarried females, and females who had not ever been pregnant were less likely to be aware and knowledgeable of folic acid or take folic acid supplements. In count, females at high danger of insufficient folate consumption were fewer likely to take folic acid supplements. The percentage of females taking folic acid supplements was meaningfully higher among educated females than among unknowledgeable females. (33). whereas, this study is about knowledge and consumption of many vitamins' and minerals.

The previous study shows that there is a decreased amount of iron and calcium supplements intakes (34). While a result of this survey indicates the increased rate of iron and calcium supplements.

4 CONCLUSION

In summary, the results of this investigation study clarify that there was good prevalence of dietary supplement use among 79% of medical college students. Knowledge about the dietary supplements found very good in 56% of medical students, but most popular dietary supplements belonged to the categories of "Vitamins" and/or"Minerals" not providedwith correct knowledge. However, 1.5% of the students were marked to have very poor knowledge. The mean age of the students were 22 years from the n=200 of sample size. The study doesn't investigate which gender consuming dietary supplements more frequently, but a 16% were male students and 84% female undergraduates took part in this study from which, 79% of them consuming the supplements in past 12 months, while 21% denoted that they are not taking any suplements.

REFERENCES

1. Worsley A. Nutrition knowledge and food consumption: can nutrition knowledge change food behaviour? Asia Pacific Journal of Clinical Nutrition. 2002 Dec; 11(s3): S579–85.
2. Williams MH. Dietary supplements and sports performance: minerals. Journal of the international society of sports nutrition. 2005;2(1):43
3. Exercise physiology: theory and application to fitness and performance (Book, 2015) [worldcat.org].
4. Dong R, Sun S, Liu X-Z, Shen Z, Chen G, Zheng S. Fat-soluble vitamin deficiency in pediatric patients with biliary atresia. Gastroenterology research and practice. 2017; 2017:1–8.
5. Sklan D. Vitamin A in human nutrition. Progressive food and nutrition sciences 1987; 11(1):39-55.
6. Albahrani AA, Greaves RF. Fat-Soluble Vitamins: Clinical indications and current challenges for chromatographic measurement. :21.
7. Böhm V. Vitamin E. Antioxidants. 2018 Mar 20;7(3):44.
8. Dinicolantonio JJ, Bhutani J, O'Keefe JH. The health benefits of vitamin K. Open Heart. 2015 Oct;2(1): e000300.
9. Said HM. Intestinal absorption of water-soluble vitamins in health and disease. Biochemical Journal. 2011 Aug 1; 437(3):357–72.
10. Fattal-Valevski A. Thiamine (Vitamin B_1). Journal of Evidence-Based Complementary & Alternative Medicine. 2011 Jan;16(1):12–20.
11. Osiezagha K, Ali S., Freeman C., Barker N. C, Jabeen S, Maitra S, Olagbemiro Y, Richie W, Bailey R. K. Thiamine deficiency and delirium. Innovations in clinical neuroscience. (2013).10(4), 26-32.
12. Bhusal A, Banks SW. Riboflavin deficiency [Updated 2017 Nov 29] statpearls - NCBI Bookshelf
13. Nagalski A, Bryła J. Zastosowanie niacyny w terapii. Postepy Hig Med Dosw. :15.
14. Institute of Medicine. Dietary reference intakes for thiamin, riboflavin, niacin, vitamin B6, folate, vitamin B 12, pantothenic acid, biotin, and choline. Washington, DC 1998.: The National academies press: https://doi.org/10.17226/6015
15. Albersen M, Bosma M, Jans JJM, Hofstede FC, van Hasselt PM, de Sain-van der Velden MGM, et al. Vitamin B6 in plasma and cerebrospinal fluid of children. Trullas R, editor. PLOS ONE. 2015;10(3): 0120972.
16. Oh R, Brown DL. Vitamin B12 deficiency washington Am Fam physician. 2003;67(5):979-986.
17. Bae J-Y, Park G-H, Yoo K-Y, Lee J-Y, Kim D-J, Bai SC. Re-evaluation of the optimum dietary vitamin C requirement in Juvenile Eel, Anguilla japonica by using L-ascorbyl-2-monophosphate. Asian-Australasian Journal of Animal Sciences. 2011;25(1):98–103.
18. Spada PDS, Bortolin GV, Prá D, Santos CEI, Dias JF, Henriques JAP, et al. Macro and micro minerals: are frozen fruits a good source? Anais da Academia Brasileira de Ciências. 2010;82(4):861–7.
19. Institute of Medicine (U.S.), editor. Dietary reference intakes: for calcium, phosphorus, magnesium, vitamin D, and fluoride. Washington, D.C: National Academy Press; 1997. 432 .
20. Trautvetter U, Ditscheid B, Jahreis G, Glei M. Habitual intakes, food sources and excretions of phosphorus and calcium in three german study collectives. Nutrients. 2018;10(2):171.
21. Stone M, Martyn L, Weaver C. Potassium intake, bioavailability, hypertension, and glucose control. Nutrients. 2016;8(7):444.
22. Lewandowska M, Sirko A. Recent advances in understanding plant response to sulfur-deficiency. 2008; 55:15.
23. National Research Council. Recommended dietary allowances: 10th Edition. Washington, DC: 1989. The National Academies Press. https://doi.org/10.17226/1349
24. Bhattacharya PT, Misra SR, Hussain M. Nutritional aspects of essential trace elements in oral health and disease: An Extensive Review. Scientifica. 2016; 2016:1–12.
25. Chitturi R, Baddam VR, Prasad L, Prashanth L, Kattapagari K. A review on role of essential trace elements in health and disease. Journal of Dr NTR University of Health Sciences. 2015;4(2):75.

26. Abbaspour N, Hurrell R, Kelishadi R. Review on iron and its importance for human health. *J Res Med Sci*. 2014;19(2):164-74.
27. Plum LM, Rink L, Haase H. The essential toxin: Impact of zinc on human health. International Journal of Environmental Research and Public Health. 2010 Mar 26;7(4):1342–65.
28. Leung AM, Braverman LE. Consequences of excess iodine. Nature Reviews Endocrinology. 2014;(3):136–42
29. Kobayashi E, Sato Y, Umegaki K, Chiba T. The prevalence of dietary supplement use among college students: A Nationwide Survey in Japan. Nutrients. 2017 Nov 15;9(11):1250.
30. Sotoudeh G, Kabiri S, Yeganeh HS, Koohdani F, Khajehnasiri F, Khosravi S. Predictors of dietary supplement usage among medical interns of Tehran university of medical sciences. J Health Popul Nutr. 2015;33(1):68-75.
31. Minkyeong Kim, Yujin Lee, Kyong Park. Vitamin and mineral supplement use among korean adults: baseline data from the trace element study of korean adults in yeungnam area. Nutrients. 2018 Jan 6;10(1):50.
32. Stanojevic-Ristic Z, Stevic S, Rasic J, Valjarevic D, Dejanovic M, Valjarevic A. Influence of pharmacological education on perceptions, attitudes and use of dietary supplements by medical students. BMC Complementary and Alternative Medicine [Internet]. 2017 ;17(1).
33. Kim MJ, Kim J, Hwang EJ, Song Y, Kim H, Hyun T. Awareness, knowledge, and use of folic acid among non-pregnant Korean women of childbearing age. Nutrition Research and Practice. 2018;12(1):78.
34. Sotoudeh G, Kabiri S, Yeganeh HS, Koohdani F, Khajehnasiri F, Khosravi S. Predictors of dietary supplement usage among medical interns of Tehran university of medical sciences. J Health Popul Nutr. 2015;33(1):68-75