



Appreciation and Perception about Multivitamins Consumption amongst the General Population in Pune City.

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ABSTRACT

Aim. Use of supplements has increased substantially in the past few decades. The present study is an effort to explore pattern of use, knowledge, perception and attitude toward consumption of multivitamin supplements among the general population.

Methodology: A cross sectional questionnaire-based online-study was conducted among general population in and around Pune.

Result: Majority of the participants were unaware regarding the correct indications for multivitamin supplementation. Regarding knowledge about the natural sources of these vitamins as many as showed ignorance. The results of the present study indicated that the use of multivitamins can statistically exert significant effect on oral health.

Conclusion: Finding from this study suggests that multivitamin use is highly prevalent and the majority of the participants were ignorant of any possible harm or drug interactions. In light of this, there is a need to adopt certain educational interventions to minimize self-directed supplement use and increase awareness regarding their correct usage.

Keywords: Awareness, Multivitamins, Health supplements, Vitamin deficiency.

I. INTRODUCTION:

The Food Safety and Standard Authority of India (FSSAI) defines Health supplements (HSs) as, “concentrated sources of nutrients (i.e., vitamins and minerals) or other substances with a physiological effect that are marketed in “dose” form (e.g., pills, tablets, capsules, liquids in measured doses)”¹ Health supplements are often used to address medical conditions. Vitamin C is used to cure scurvy, whereas vitamin D is used to prevent and treat rickets.

All metabolic processes that use proteins, lipids, and carbs for energy, growth, and cell maintenance are catalyzed by vitamins. Vitamins are typically given as dietary supplements because food only contains trace amounts of these essential compounds.² Water-soluble vitamins like B and C are eliminated if not absorbed, whereas fat-soluble vitamins like A, C, D, E, and K can be retained as reserves in the liver and fat tissues.

Furthermore, there has been inconsistent evidence regarding the role of Health supplements in non-communicable diseases like cancer and cardiovascular problems. Although studies have indicated that Health supplements can lower the chance of experiencing the aforementioned health problems.³

Globally, the usage of health supplements has significantly increased in recent years as a result of media portrayals of supplements as risk-free health goods. Additionally, there is mounting evidence that health supplements intake is linked to good behaviors like consistent exercise, abstaining from tobacco products, and maintaining a healthy body weight.⁴

In complementary and alternative medicine (CAM), the widespread use of vitamin supplements is a prevailing trend. Individuals often turn to these supplements seeking holistic approaches to health and wellness. The popularity of vitamin supplementation is intertwined with a desire for preventative healthcare, driven by the belief that supplements can address nutritional gaps and support overall well-being. Furthermore, within the CAM landscape, prayers hold a unique significance. Many individuals incorporate spiritual practices, including prayers, viewing them as complementary elements in their pursuit of physical and mental balance.⁵



Among the fastest-growing sectors globally, the vitamin supplement industry is experiencing unprecedented expansion. This growth is fueled by evolving consumer attitudes towards proactive health management. The industry's dynamism is also propelled by ongoing research revealing potential health benefits associated with specific vitamins. As awareness of preventive health measures increases, the demand for vitamin supplements continues to surge. This expansion extends beyond traditional markets, as diverse demographics increasingly recognize the role of supplements in supporting their health and lifestyle choices.⁶

In the United States alone, the market for vitamin supplements has undergone remarkable growth, surpassing expectations. With sales exceeding \$21 billion in 2006, this surge highlights the integration of supplements into mainstream health practices. Archer et al.'s⁸ research sheds light on the prevalence of vitamin supplement use, revealing that only 52 percent of participants take at least one supplement into their daily routines. Additionally, Gardiner et al.'s⁹ study states that only 27 percent of young individuals have used vitamin supplements in the month preceding the survey. The varying usage patterns of vitamins across the demographics highlight the difference between age groups and supplement preferences, contributing valuable data to the broader understanding of supplement consumption trends.

The aim of this study is to investigate the prevalence, motivations, and patterns of vitamin supplement usage within the general population. The objectives of this study are, a.) To assess the level of knowledge, b.) To explore attitudes, examine the beliefs, perceptions, and motivations influencing individuals' attitudes towards nutritional supplements and c.) To investigate the relevant practices regarding patterns of nutritional supplement buying and consumption among study participants.

II. METHODOLOGY:-

The questionnaire aimed to assess the self-reported knowledge and attitudes of multivitamins consumption in the general population of Pune City.

The study was conducted among the general population of Pune city. A random sampling method was used and the sample size was determined using the formula .

$$N=(z \ 1-\alpha/2 \ 2 \ p(1-p))/d^2,$$

Where,

$Z_{\alpha/2}$ -is the critical value of the normal distribution at $\alpha/2$. (at confidence level of 95% , α is 0.05 and the critical value is 1.96)

D= margin of error which is 5% considered here

P= prevalence of 90%

Therefore, substituting the values in the formula,

$$N=1.96 \times 1.96 \times 0.90 \times 0.90 / 0.05 \times 0.05=311$$

Considering 10% of non-responsiveness, sample size is calculated as

$$N=n/0.9=192/0.9= 346$$

For which the final sample size is 346

A pilot study was conducted to ensure the reliability and validity of the questionnaire. During this phase, coding issues and ambiguous questions were identified and resolved. Four questions were subsequently excluded, and Cronbach's Alpha value was calculated to be 0.613, indicating acceptable internal consistency.

Data collection was facilitated through Google Forms (GOOGLE LLC, Mountain View, California, United States). The survey link was distributed to selected participants through email, WhatsApp, and various social media platforms, including Instagram and Telegram. The questionnaire comprised 27 questions, encompassing general demographics such as age and occupation, as well as inquiries related Knowledge, attitudes and practice regarding vitamin supplementation. Such that the data collected, analyzed and expressed as counts and percentage.



III. RESULTS:-

Sr. No	Demographic Details	Response	N	Percentage (%)	Total (%)
1	Age	18-29	209	43.7	478(100)
		30-49	219	45.8	
		50-69	50	10.4	
2	Occupation	Student	97	20.2	478(100)
		Working	220	46.1	
		Not Working	161	33.52	

TABLE 1: DEMOGRAPHIC DATA

Sr.No.	Questions	Responses	N	%	Total (%)
1	What do you think vitamins can affect your oral health ?	Yes	415	87.2	478(100)
		No	61	12.8	
2	Do you believe vitamin supplements are necessary?	Yes	476	99.6	478(100)
		No	2	0.4	
3	Do you have knowledge regarding side-effects or interactions of vitamin supplements?	Yes	225	47.2	478(100)
		No	252	52.8	
4	multivitamin supplements treat chronic diseases?	Strongly agree	237	49.7	478(100)
		Agree	203	42.6	
		Neutral	37	7.8	
		Disagree	120	25	
		Strongly disagree	119	24	
5	Taking daliy multivitamin can significantly improve oral health.	Strongly agree	0	0	478(100)
		Agree	225	47.2	
		Neutral	252	52.8	



		Disagree	0	0	
		Strongly disagree	0	0	
6	multivitamins be seen as a complement to a healthy lifestyle.	Strongly agree	23	4.8	478(100)
		Agree	203	42.6	
		Neutral	251	52.6	
		Disagree	0	0	
		Strongly disagree	0	0	
7	Multivitamins can be beneficial for individuals who have difficulty getting enough nutrients from there diet.	Strongly agree	24	5	478(100)
		Agree	202	42.3	
		Neutral	251	52.6	
		Disagree	0	0	
		Strongly disagree	0	0	
8	Have you used Multivitamins?	Yes	438	91.8	478(100)
		No	39	8.2	
9	Multivitamins alone can prevent dental issues like cavities and gum disease.	Strongly agree	23	4.8	478(100)
		Agree	200	41.9	
		Neutral	252	52.8	
		Disagree	0	0	
		Strongly disagree	0	0	



10	Do you consider taking vitamins to be helpful for your health?	Yes	440	92.2	478(100)
		No	37	7.8	
11	What is the frequency of usage of vitamin supplements by you?	Once daily	202	42.3	478(100)
		Twice daily	275	57.7	
12	vitamin supplements can prevent chronic diseases	Strongly agree	275	57.7	478(100)
		Agree	201	42.1	
		Disagree	0	0	
		Strongly disagree	0	0	
13	Do you believe you get enough multivitamins and minerals from your diet?	Yes	475	99.5	478(100)
		No	3	0.5	
14	Vitamin C and calcium can support gum and tooth health.	Strongly agree	215	45.1	478(100)
		Agree	224	47	
		Neutral	37	7.8	
		Disagree	0	0	
		Strongly disagree	0	0	
15	Multivitamins can be particularly beneficial for individuals who have specific oral health concerns or nutrients deficiency.	Strongly agree	23	4.8	478(100)
		Agree	202	42.3	
		Neutral	251	52.6	
		Disagree	0	0	



		Strongly disagree	0	0	
16	What benefits do you think multivitamins provide?	Gingival health	199	41.7	478(100)
		Overall health	0	0	
		Both	277	58.1	
17	Who do you think needs multivitamins as supplements?	Pregnant women	0	0	478(100)
		Persons with oral disease	0	0	
		Individual with low calorie diet	214	44.9	
		All of the above	262	54.9	
18	What are the side effects on oral cavity of multivitamins deficiency ?	Periodontal disease	3	0.6	478(100)
		Malnutrition	0	0	
		Mucosal ulcers	0	0	
		Glossitis	0	0	
		All of the above	474	99.4	
19	What are the effects of vitamin deficiency on children?	Enamel hypoplasia	216	45.3	478(100)
		Erosive tooth wear	0	0	
		Both	260	54.5	
20	Which of the following vitamins help in improving oral health?	Vitamin c and vitamin D	2	0.4	478(100)
		Vitamin B &E	0	0	
		Vitamin B12	1	0.2	



		All of the above	474	99.4	
21	Which of the following is rich source of vitamin C	Citrus fruit	198	41.5	478(100)
		Tomato	0	0	
		Strawberry	0	0	
		All of the above	278	58.3	
22	Which kind of disease vitamin C prevents in our oral cavity?	Scurvy	222	46.5	478(100)
		Gingivitis	0	0	
		Loss of teeth	0	0	
		All of the above	254	53.2	
23	What are the rich sources of vitamin D?	Sunlight	2	0.2	478(100)
		Milk	1	0.2	
		Cod liver oil	1	0.2	
		All of the above	473	99.2	
24	Are you aware about the role of vitamins on oral health?	Yes	225	47.2	478(100)
		No	252	52.8	
25	Do you suffer from any vitamin deficiency?	Yes	221	47	478(100)
		No	257	53	
26	Have you taken any vitamin supplements in your life?	Yes	221	47	478(100)
		No	257	53	



27	Which are the side effects of vitamin D deficiency?	Reduced bone density	430	90.1	478(100)
		Gingivitis	0	0	
		Glossitis	30	6.2	
		Bleeding gum	18	3.7	

Table 2: Questionnaire with responses in frequency and percentages.

Table 1 provides, concise overview of the age and occupational composition of the surveyed population, offering valuable insights into the demographics of the participants. For instance, it shows that a significant portion of the respondents falls within the 18-29 age range, and the majority are employed. These details are crucial for contextualizing the survey results and understanding the perspectives of different demographic groups.

Table 2 encapsulates a comprehensive snapshot of the attitudes and behaviors of 478 individuals within Pune city regarding the intricate relationship between vitamin supplements and oral health. A notable 87.2% of participants acknowledge the potential impact of vitamins on oral well-being, highlighting a general awareness of the interplay between nutrition and dental health. The overwhelming consensus, with 99.6% considering vitamin supplements necessary, underscores the perceived importance of these supplements in the context of overall health. Furthermore, approximately half of the respondents (47.2%) demonstrate knowledge concerning potential side effects or interactions associated with vitamin supplements, reflecting a nuanced understanding within the surveyed population. Examining the practical aspects, the survey reveals that a substantial 91.8% of participants have actively used multivitamins, emphasizing the prevalent incorporation of such supplements into daily routines. Among those supplement users, 57.7% adhere to a twice-daily regimen, shedding light on the frequency and consistency of vitamin supplement intake. In exploring beliefs about the preventive effects of multivitamins on chronic diseases, the responses indicate a diversity of opinions, reflecting a nuanced understanding of the potential benefits. Moreover, over half of the respondents (54.9%) recognize the necessity of

vitamin supplements for specific populations, such as pregnant women, individuals with oral diseases, and those with low-calorie diets.

IV. DISCUSSION:-

The present study has been conducted with the objective of investigating the effect of using multivitamins supplements on oral health.

The results of the present study indicated that the use of multivitamins can statistically exert significant effect on oral health.

In our study, 87% of cohort members believe that vitamin use has an effect on their oral health. In the study by al-NaggarRA and chen R¹, when the cohort members were asked about vitamin use, 80% of the study population cited the main reason for vitamin use as an effect on health, similar to our study

Nearly all of the population in our study feels that vitamin supplements are vital, but only 79% of the population in a study by Qidwai W et al.² felt that vitamin supplements are important. This indicates that our study had higher scores.

When questioned about their use of multivitamins, 92% of the participants in our study said they had taken them. On the other hand, our study's improved score corresponds with a study by Suleiman et al.³ where the cohort reported using multivitamins at a rate of 27.4%.

Nearly all respondents agreed that vitamin supplements may prevent chronic diseases when asked whether they could. This result differs from that of Elshahryi NA et al.⁴ in Jordan, where only 12.1% of the survey participants felt that vitamin supplementation may prevent chronic illnesses.

Compared to the study conducted in Bangladesh by Kraemer K et al.⁵, our study shows that 99.5% of participants thought their diet provided adequate multivitamins and minerals.



Pune's urbanization and increased awareness of health issues may have contributed to our findings.

Our study found that 42.3% of the population used multivitamins once a day while 57.7% used them twice a day, when compared to a similar study done in Rajasthan by Saini S and Hasan N 6 they found that, 39.8% took vitamins once daily and 24.4% took it twice daily.

During our study, only 41.5% of the population correctly answered the question about the natural sources of multivitamins, when compared to the study done by Sekhri K and Kaur K 7 the scores were dissimilar as only 24% of the population knew about the correct source of multivitamins which is a lesser score than our study.

90% of population in our study had knowledge of vitamin D deficiency's effects, compared to the study done by Tanna NK et al 8 only 75% of the population were aware of the occurring ill-effects of vitamin D deficiency.

Findings from this study suggest that multivitamin use is highly prevalent and the majority of the participants were ignorant of any possible harm or drug interactions. In light of this, there is a need to adopt certain educational interventions to minimize self-directed supplement use. At the same time health care professionals should take extra care to know about their patients' multivitamin use and hence should counsel them about the correct use. Preaching should be to eat the diet consisting of fresh fruits and vegetables.

V. CONCLUSION:-

Our study indicates a prevalent and robust awareness of the importance of vitamin supplements for overall health and oral well-being in general population in Pune. The cohort exhibits a proactive approach to health, particularly evident in the widespread use of multivitamins. The strong belief in the preventive properties of vitamins against chronic diseases suggests a positive health mindset within the surveyed population. Additionally, participants express confidence in deriving sufficient vitamins from their diets, reflecting a favorable dietary self-assessment. The heightened awareness of the consequences of vitamin D deficiency further emphasizes the community's attentiveness to health matters. These collective findings underscore a health-conscious culture in Pune, reflecting potential regional and cultural influences on attitudes and practices related to nutritional supplementation and oral health.

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