Original Article

Increase in Nutritional Supplementation for Prevention of COVID-19 in General Population of Lahore

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ABSTRACT

Objective: To evaluate the rise in supplement intake and their associated factors during COVID-19.

Methodology: This analytical cross-sectional study was conducted at the Department of Community Medicine, Akhtar Saeed Medical & Dental College, Lahore on the general population of Lahore. A pretested questionnaire containing information regarding socio-demographic data and supplement utilization before and during the pandemic was used to collect data through online Google forms. The sample size was 257 people selected with a 95% confidence level and 5% margin of error. The sample was collected with convenience sampling technique. The data was entered and analyzed in Statistical Package for the Social Sciences (SSPP) version 23. McNemar's test was used to test an increase in supplement intake. Chi-square test and multinomial logistic regression were used to analyze the factors associated with the increase in supplements.

Results: A statistically significant increase in supplement intake was observed during COVID-19 (p-value <0.0001). The most commonly used supplement was multivitamins. Female gender and age 26 to 50 years had high odds of supplement use. The most common perceived side effects of supplements were stomach pain, rapid heart rate, and constipation.

Conclusion: The usage of supplements for the prevention of COVID-19 increased by 21.4% during the pandemic. Females of age 26 to 50 years were more commonly found to use supplements.

Keywords: *Supplements. Pandemic. COVID-19.*

INTRODUCTION

The COVID-19 is widely recognized as a major global health catastrophe of the century and the greatest threat to world stability since World War II. This view is supported by the fact that the coronavirus has already infected more than one hundred countries.[1] On January 7, 2020, the World Health Organization (WHO) announced that a novel coronavirus discovered in a throat swab of one of the patients was the virus that caused the outbreak, and they named it "SARS-COV-2".[2]

The bioavailable forms of levels that are comparable to high dosages of vitamins and minerals are known as supplements. We refer to the nutrients in our diet that have a demonstrated nutritional or physiological effect as supplements. Data indicates that certain supplements can be helpful both for the prevention and therapy of SARS-COV-2.[3]

Due to a lack of an effective remedy during the epidemic, almost every country implemented a statewide lockdown, which had a disastrous impact on enterprises worldwide. However, the supplement industry saw a reversal of fortunes as the USD 101.38 billion worldwide dietary supplement market doubled in size by the year 2020 (about USD 220.3 billion).[4] Beginning in March 2020, sales of dietary supplements in the United Kingdom increased by 19.5%, with sales of vitamin C jumping by 110% and sales of multivitamin supplements increasing by 93%. In the first week of March 2020, zinc supplement sales in the United States had an increase that was 415 times higher than the comparable sales from the same week in the previous year.[5] Multivitamin supplementation boosts immunity.[6]

The findings of the first wave of the COVID-19 online trial by Google trends showed that 4.4% of the 2296 participants started using all supplements, while 9.3% started taking some supplements. According to the findings of the second wave of the COVID-19 study, 25% of participants were using at least one kind of supplement, and 9.3% were utilizing all types of supplements.[7] Another study conducted by the University of Chicago Medicine reported that the risk of obtaining a positive COVID-19 test increases in those who have low levels of vitamin D (less than 20 mg/mL). In addition to this, it was discovered that patients had a decreased risk of getting acute respiratory tract infections with supplement usage.[8] According to a study carried out in Karachi, Pakistan, the anti-inflammatory characteristics of vitamin C were beneficial in the treatment process, which led to a discernible improvement in clinical symptoms in COVID-19 patients.[9]

People may take dietary supplements without first consulting a physician during outbreaks of infectious

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diseases. Despite the fact that only people with a prescription from a physician or those who are nutritionally deficient (malnourished) should use dietary supplements because of the risk of adverse effects, the general public may increase their consumption of dietary supplements during pandemic times.[3] The goal of this study was to establish whether the increased consumption of dietary supplements by the general public during the pandemic was helpful or not. The study will also help in understanding the effects of daily consumption of dietary supplements on individuals who are concerned about COVID-19 in the local population.

METHODOLOGY

After receiving approval from the institutional review board, this analytical cross-sectional study was conducted at the Department of Community Medicine, Akhtar Saeed Medical & Dental College, Lahore. The study was carried out on the general population of Lahore from April to September 2021 through online Google forms. The sample size was calculated to be 257 at a 95% confidence interval and 5% margin of error using the anticipated frequency of supplement use to be 20%.[10] The sample was collected with convenience sampling from the general population of Lahore. All individuals above 18 years and both genders were included in the study. A self-structured questionnaire was used to collect the data. The questionnaire was developed after an in-depth literature search and was validated by a pilot study of 20 participants. Changes were incorporated in the final questionnaire. The questionnaire contained demographic variables of participants, questions regarding the use of supplements before and during the pandemic, and the factors associated with them. Participants who had already been diagnosed with COVID-19 were excluded from the study. The study was conducted after obtaining informed consent from respondents who were assured about data confidentiality.

STATISTICAL ANALYSIS

The data was entered and analyzed by Statistical Package for the Social Sciences (SPSS) version 23. McNemar's test was used to test an increase in supplement intake. We used the Chi-square test and binomial logistic regression to analyze the increase in supplement use and demographic variables (age, gender, marital status, educational status, residence) and perceptions. Significant factors ($p \leq 0.05$) on bivariate analysis were incorporated into the binary logistic regression, which resulted in the reporting of an adjusted odds ratio and 95% confidence intervals. A p-value less than 0.05 was taken as significant.

RESULTS

Out of the total 257 study participants, the mean age was 28.22±9.7 years. A total of 136(52.9%) were in age group 18-25years, 106(41.3%) were in age group 26-50 years, and 15(5.8%) were in age group above 50 years. There were 157(61.1%) males and 100(38.9%) females in the study. Ninety three (36.2%) participants were married and 164(63.8%) were unmarried. In our study, 217(84.4%) belonged to urban areas and 40(15.6%) belonged to rural areas. The educational status of participants showed that 6(2.3%) were illiterate, 3(1.2%) got primary education, 7(2.7%) did matriculation, 63(24.5%) got intermediate education, 143(55.7%) were graduated, and 35(13.6%) did postgraduation. Among study participants, 75(29.2%) had monthly income below 25000, 64(24.9%) had monthly income 25001-50000, 45(17.5%) had monthly income of more than 50001-75000, 16(6.2%) had monthly income more than 75001-100000, and 57(22.2%) had monthly income more than 100,000.

The use of supplement intake increased during the pandemic period. Out of 257 participants, 100(38.9%) of participants were taking supplements before the pandemic, whereas during the pandemic this number increased to 155(60.3%). McNemar's test was used to find out the statistical significance (<0.001) with the rise in supplement use (Table 1).

Perceived side effects of supplements were: 67(26.1%) had stomach pain, 64(24.9%) had rapid heart rate, 64(24.9%) had constipation, 61(23.7%) had nausea, 39(15.2%) had dizziness, 20(7.7%) had vomiting, and 1(0.4%) had diarrhea after taking supplements. Out of 257 total respondents, 98(38.1%) were taking supplements regularly and 159(61.9%) were not taking supplements regularly. Some respondents used more than 1 type of supplement. Out of total respondents, 169(65.8%) were taking multivitamins, 111(43.2%) were taking vitamin C, 100(38.9%) were taking calcium, 69(26.8%) were taking vitamin D, 62(24.1%) were taking zinc, and 1(0.4%) was taking folic acid. Out of 257 respondents, 121(47.1%) were taking supplements for less than 3 months and 136(52.9%) were taking supplements for more than 3 months.

The Chi-square test was used to find out supplement use with socio-demographic variables and perceptions about supplement intake (Table 2).

Gender was found significant subjected to binomial logistic regression as shown in Table 3. The results showed that the adjusted odds ratio for supplement intake by females is 1.966 with a 95% confidence interval (1.138 to 3.399).

DISCUSSION

This study was conducted to find out how the pandemic affected the population's consumption of and reliance

Table 1: McNemar's Test to Check the Rise in Supplement Intake during the Pandemic

Rise in Supplement Intake		Taking Supplements during Pandemic		p-value
		Yes	No	
Taking Supplements before the Pandemic	Yes	74	26	<0.0001*
	No	81	76	

**Significant p-value*

Table 2: Bivariate Analysis of Variables Associated with the Use of Supplements during the Pandemic

Variables		Supplement Intake during the Pandemic		Chi-Square	p-value
		Yes (n=155)	No (n=102)		
Gender	Females	71(46%)	29(18%)	7.81	0.005*
	Males	84(54%)	73(82%)		
Age (Years)	18-25	75(48.4%)	61(59.8%)	5.94	0.052
	26-50	73(47.1%)	33(32.4%)		
	Above 50	7(4.5%)	8(7.8%)		
Marital Status	Married	60(38.7%)	33(32.4%)	1.076	0.299
	Unmarried	95(61.3%)	69(67.6%)		
Educational Status	Illiterate	2(1.3%)	4(3.9%)	10.05	0.050
	Primary	3(1.9%)	0(0%)		
	Secondary	4(2.6%)	3(2.9%)		
	Intermediate	39(25.2%)	24(23.5%)		
	Graduate	79(51%)	64(62.8%)		
	Postgraduate	28(18%)	7(6.9%)		
Residential Area	Rural	20(12.9%)	20(19.6%)	2.636	0.142
	Urban	135(87.1%)	82(80.4%)		
Taking Supplements can Reduce the Risk of Getting COVID-19	Yes	136(87.7%)	54(52.9%)	38.656	<0.0001*
	No	19(12.3%)	48(47.1%)		
Advised to Take the Supplements	Yes	109(70.3%)	58(56.9%)	4.8	0.027*
	No	46(29.7%)	44(43.1%)		
Advised to use Supplements for COVID-19 by	Doctors	78(50.3%)	28(27.5%)	15.4	0.004*
	Friends	19(12.3%)	20(19.6%)		
	Social Media	10(6.5%)	10(9.8%)		
	Others	48(30.9%)	44(43.1%)		

**Significant p-value*

Table 3: Binary Logistic Regression Model Identifying Factors Associated with the Use of Supplements during the Pandemic Period

Variables		Beta	Significance	Using Supplements during Pandemic Adjusted Odds Ratio	95% CI of Supplement use during the Pandemic	p-value
Gender	Females	0.672	0.016	1.966	1.138 to 3.399	0.015*
	Males			Reference	Reference	

**Significant p-value*

on dietary supplements, as well as their perspectives on the use of supplements during COVID-19 and the type of supplements used. There has been a general increase in the consumption of dietary supplements and an accompanying rise in reliance among people of all ages and genders around the globe. There are a variety of factors contributing to this, including social and pharmacological factors, as well as an overall heightened awareness of the importance of one's health. This indicates that a rising number of people are consuming supplements in the modern day. One possible explanation is that people are becoming more health-conscious, but at the same time, they are falling prey to aggressive marketing campaigns in the media.[11]

This study revealed that there is a 21.4 percent increase in the uptake of supplements during the pandemic period which is statistically significant (p-value=0.00). This shows that approximately 60.3% population is taking supplements. This finding is similar to other studies which show that 50 to 70 percent of the population is using supplements during the pandemic period.[5] In our study, 73.9% of participants considered that they could avoid contracting COVID-19 with supplement use. This perception is supported by other studies that recommend supplements for boosting immunity.[12] It is important that other measures such as masks and safe distancing should not be ignored. Another study showed that 26.8% felt an improvement in their symptoms if they used supplements during COVID-19.[5]

Our study showed that the use of supplements was advised by doctors [106(41.3%)], friends [39(15.2%)], and social media [20(7.7%)]. Using supplements that are not recommended can lead to adverse effects and drug interactions in those people who are consuming other drugs or have conditions like liver or kidney disease. Social media is influencing the behavior of people in hand washing practices and even supplement or vitamin intake.[13] The most common side effects of supplements observed in our study were stomach pain, rapid heart rate, constipation, nausea, dizziness, vomiting, and diarrhea. These are similar to a previous study done in Saudi Arabia.[14] Further analysis revealed that most of the respondents [169(66%)] used multivitamins as a dietary supplement. Similarly, a study reported that 68% of the study population took multivitamins, thus making it the most frequently used dietary supplement.[15]

Our study showed that 155(60.3%) participants taking supplements felt that there was a reduced risk of COVID-19 with supplement intake. A study has shown that there is a decrease in the severity of disease with vitamin intake.[15] This may be due to a boost in immunity with vitamin intake. Another community survey in the UK showed that taking vitamins, probiotics, and omega-3 fatty acids reduce the likelihood of getting a positive COVID-19 polymerase chain reaction by 14%.[16]

The results of this study showed that the females have an increased likelihood of using supplements [adjusted odds ratio of 1.966 (95% CI: 1.138 to 3.399)]. Another study has shown that females used 1.3 times more vitamin C supplements during the COVID-19 pandemic than males.[17] Other studies show that female athletes and soldiers use more supplements and multivitamins than males.[18,19] This may be due to the fact that females are more inclined towards health and fitness. Our results indicated that age group between 26 to 50 years have an increased likelihood (adjusted odds ratio 2.523) of taking supplements than those aged below 25 years. Similar results were reported in another study. According to them, middle aged people take more supplements than the younger age group.[17]

CONCLUSION

The rise in nutritional supplement intake for the prevention of COVID-19 increased by 21.4% during the pandemic and the use was significantly higher in females of age 26 to 50 years. The increase in supplement use can be attributed to doctors, friends, and social media.

LIMITATIONS & RECOMMENDATIONS

The limitation of this study is that it didn't include the dose of supplement intake and the data was self-reported. It was a cross-sectional survey, hence causality cannot be established.

Multivitamins intake boosts immunity but they should be used with the recommendation of health care professionals. Multivitamins sold should be approved by the Drug Regulatory Authority of Pakistan, so that the recommended doses are followed by the companies.

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