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Consumption Motives of Dietary Supplement Food

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Abstract: ***In today's time everyone becomes aware and conscious about their health and diet. Because of increment in various disease and people start suffering with different health issues. Consequence of this momentum is increasing consumption of dietary supplements food in developed as well as developing countries during the last few years and faced enormous growth in availability of various types of dietary supplements in the market. The use of dietary supplements is often related with healthy lifestyle. The rational of this paper is to find out the motives for the consumption of dietary supplement food related with age variable. To accomplish the results in the existing study, Factor analysis technique of data reduction has been used. Different motives found behind the consumption of dietary supplement food by various age categories. The results of this study reveal that lifestyle motives vary between young and middle age respondents with old aged respondents.***

Keywords: Age, Consumption, Dietary supplement, Factor Analysis, Motives.

I. INTRODUCTION

Food

Food provides the energy for all of the body's functions and the building blocks for growth and maintenance. Food is the "fuel" which delivers chemical energy to the body to support daily activity and combination of necessary chemicals within the body. (Potter and Hotchkiss, 2006). The food industry is complex, global collective of diverse businesses that together delivers much of the food energy required and consumed by the countrymen of all the countries in world population. (http://www.sethassociates.com/food_and_drug_industry_in_india.php). The Indian food industry has witnessed strong growth over the past few years. India stands as the world's second leading producer of food after to China, and the likelihoods and potential of becoming the leading producer in the years to come. The total food production in India is likely to double in the next ten years. (http://www.ibef.org/industry/indian-food-industry.aspx). From the last few years, people have considerably gained their interest towards the relationship between healthy eating and good health. Now there is more awareness than past days regarding health issues and people get an insight that they can rescue themselves and their families from the various disease and illness through healthy lifestyle and balanced diet. For achieving this momentum role of foods such as fruit and vegetables and wholegrain cereals cannot be neglected and with support of this consumption of dietary supplements go hand in hand (Chen, Lin, Kao and Hang, 2005). According to DSHEA (1994), a dietary supplement is defined as:

"…a product (other than tobacco) that is intended to supplement the diet that bears or contains one or more of the following dietary ingredients: a vitamin; mineral; an herb or other botanical; an amino acid; a dietary substance for use by man to supplement the diet by increasing the total daily intake; or a concentrate, metabolite, constituent, extract, or combinations of these ingredients. A dietary supplement is intended for ingestion in pill, capsule, tablet, or liquid form; is not represented for use as a conventional food or as the sole item of a meal or diet; and is labelled as a dietary supplement".

Market Scenario

According to the latest survey, the Indian food market is about to be double by the year 2025. The speedy economic development, state-of-the-art technology and food production, budding consumerism and enhanced lifestyle are the main motivation behind this growth. Over the past few years, the annual output of the food market in India has been around $ 155 billion which is expected to reach $344 billion by the year 2025. The annual growth rate of food market is expected to be around 4.1 percentages. (http://business.mapsofindia.com/india-market/food.html). The dietary supplements market in India is estimated to show a CAGR of 11.60% during 2016-2021, due to rapid growth of urbanisation, increasing health awareness, attached with growing demand from athletes all across the country. Furthermore, dietary supplements can be characterised into various categories. In product type amongst which, vitamin & mineral dietary supplements controlled India dietary supplements market in 2016, and is further projected to continue its supremacy in upcoming time (https://www.techsciresearch.com).

II. Literature Review

As it is noticeable that usage of dietary supplements gaining momentum by each passing days, so it is important to know the motives behind adopting this behaviour by the population. Reasons or motives that have an effect on the usage of dietary supplements are incline to be complex and relating with various social, psychological, economic aspects and diverse theories of decision making Conner *et al* (2003). O'Dea (2003) investigated that majority of youth means young population carry an opinion that the intake of dietary supplements is favourable for their health and users realized over the period that consumption of dietary supplements helps to avert various disease and illness. Mc Dowall (2007) mentioned that usually females are more inclined towards the usage of dietary supplements and reason of consumption is health, speedy recovery and backing insufficient and poor diet. Males are tending to use dietary supplements to improve their sports performance. Increased energy is equally appraised by both the gender as a purpose of dietary supplement consumption.

McLellan (2013) go through with various studies and attempts to find out the different facet of consumption of dietary supplement food. To find out the motives for the consumption was one of them. After studied and reviewed different studies it is concluded that increase muscles mass, better recovery and increase capacity for exercise are motives for the consumption of dietary supplement food. It is also found that consumption of dietary supplement in soldiers is high because of physical and mental stress faced by them during trainings and tough deployment. Johnson *et al* (2000) accompanied a study and investigated that supplement is consumed by the respondents more to endorse good health. Most common reason mentioned by respondents is to retain good health. According to this study only few respondents takes dietary supplements under medical advice. Furthermore various reasons of consumption was also mentioned by participants that contains boost immunity/ prevent colds, good for joints/improves or prevents arthritis, good for heart, good for blood circulation, good for bones, prevents/ helps other ailments, to supplement poor or vegetarian diet, post illness. This study determines that most significant reason to consume dietary supplement is to retain health/ stay active. Pouchieu *et al* (2013) found out various motives for consumption of dietary supplement food. Results indicated that foremost reasons for consumption of dietary supplement food are 'overcome tiredness' and 'stay healthy'. Some respondents declared that compensating for inadequate and disturbed diet and eating habits are also prompt the usage of dietary supplement food.

III. Objectives of the Study

- To study the consumption motives of dietary supplement food as per respondent's age.

IV. RESEARCH METHODOLOGY

Sampling and Data Collection

The current study is based on empirical analysis of consumption motives of dietary supplement food. The current study is based on the primary data. Convenience sampling method is followed for data collection. A total of 450 questionnaires were distributed in Delhi- NCR that includes following cities: Delhi, Gurgaon, Faridabad and Noida. Out of 450 total 430 questionnaires were found appropriate for data analysis. In this study, five point likert scale is used extending from strongly agree (5) to strongly disagree (1).

Demographic profile of respondents was scrutinized with the help of frequency distribution. Total sample size is 435. Table 1 shows the demographic profile of the respondents. Age, Gender, Educational qualification, Occupation and monthly income represent the demographic profile of the respondents. The current study has concentrated only one variable i.e. age of respondents while residual demographic variables are used somewhere else.

Statistical Techniques

To scrutinize the reliability of the scale used in the current study cronbach's alpha (Schmitt, 1996) measure of internal consistency was adopted. All the statements of questionnaire were subjected to alpha test of reliability. Exploratory factor analysis is used to get the factor loadings of various items in measurement Instrument. EFA is run through principle component analysis method (PCA) with varimax rotation on twenty four items. Factor loading tells that up to what extent factor is explained by different statements (Anderson et al., 2011). Before the application of factor analysis, value of KMO and Bartlett test of sphericity essential to be checked. Kaiser-Meyer-Olkin (KMO) test has been used to measure the sampling adequacy, which tells that factor analysis can be applied. Inter-item correlation has been identifying with the help of Bartlett's test of sphericity and it specifies that correlation among items is high enough to apply factor analysis. The value of KMO (0.785) and Bartlett's test of sphericity (0.000) is appropriate for factor analysis. In addition to factor analysis frequency distribution and ANOVA is used.

The three factors were extracted after the application of exploratory factor analysis and named as health and diet, lifestyle issues and physical fitness. To find out the difference in motives as per age of respondents ANOVA test was applied on these three factors.

Table 1: Respondents Demographics

	Demographics	Frequency	Proportion of Sample%
Gender	Male	189	43.96
	Female	241	56.04
	Total	430	100.0
Age	18 to 30 Years	218	50.69
	31 to 45 Years	57	13.25
	46 to 60 Years	80	18.60
	Above 61 Years	76	17.67
	Total	430	100.0
Education	Up to 12^{th}	79	18.37
	Graduation	223	51.86
	Post-Graduation & Above	128	29.76
	Total	430	100.0
Occupation	Govt. Job	98	22.79
	Private Job	96	22.32
	Self employed	64	14.88
	Unemployed	129	30.00
	Retired	43	10.00
	Total	430	100.0
Income	Less than to 40000 Rs	53	12.32
	40000 – 79000 Rs	150	34.88
	80000-119000 Rs	104	24.18

	120000- 159999 Rs	92	21.39
	160000 Rs & Above	31	7.20
	Total	430	100.0

Source: Primary data

Table 1 presents the demographic profile of surveyed respondents and Table 2 tells about the factor extracted after application of factor analysis. Three factors were found and the total variance explained by the three factors was 81.56

Table 2: Extraction of motives of consumption

Total Variance Explained									
Comp.	**Initial Eigenvalues**			**Extraction Sums of Squared Loadings**			**Rotation Sums of Squared Loadings**		
	Total	**% of Variance**	**Cumulative %**	**Total**	**% of Variance**	**Cumulative %**	**Total**	**% of Variance**	**Cumulative %**
1	9.171	41.213	41.213	9.171	41.213	38.213	7.885	35.855	35.855
2	4.365	23.188	61.401	4.365	23.188	61.401	5.443	24.515	60.370
3	3.880	20.167	81.568	3.880	20.167	81.568	4.433	21.198	81.568
4	.997	5.123	85.629						
5	.994	3.142	88.770						
6	.393	1.636	90.407						
7	.350	1.457	91.863						
8	.296	1.233	93.097						
9	.282	1.173	94.270						
10	.256	1.068	95.338						
11	.219	.914	96.252						
12	.214	.890	97.142						
13	.174	.724	97.866						
14	.135	.563	98.429						
15	.131	.544	98.973						
16	.075	.311	99.285						
17	.058	.242	99.526						
18	.038	.159	99.685						
19	.030	.127	99.812						
20	.017	.071	99.882						
21	.011	.046	99.928						
22	.009	.037	99.965						
23	.005	.021	99.986						
24	.003	.014	100.000						

Source: Primary data

Extraction Method: Principal Component Analysis.

Kaiser-Meyer-Olkin Measure of Sampling Adequacy=0.785

Bartlett's Test of Sphericity Chi-square=18617.83, Level of sig.=0.00

Table 3 presents the profile of consumption motives for dietary supplement food. Profiling of extracted factors, the variables under each factor along with its factor loading is illustrated in the table.

Table 3: Dimensions Extracted for Consumer's Motives of consumption

S.No.	**Factors and variables**	**Factor loadings**				
		1	2	3	4	5
F1	**HEALTH & DIET (α=0.940)**					
V1	To maintain health.	0.920				
V24	Good for heart.	0.920				
V19	Being diet conscious.	0.917				
V22	Good for blood circulation.	0.901				
V7	To improve overall health	0.898				
V9	Prevention of nutritional deficiencies	0.873				
V20	Problem eating a balanced diet.	0.862				
V2	To supplement poor or vegetarian diet.	0.861				
V8	To improve memory	0.858				
V6	Prevent disease.	0.852				
V11	Prevention of illness.	0.845				
V13	To manage arthritics.	0.837				
V5	Post illness.	0.821				
V21	Boost immunity	0.813				

F2	**LIFESTYLE ISSUES (α=0.912)**					
V3	Medical advice.		0.911			
V16	Being under stress.		0.902			
V4	Recommended by spouse/relatives..		0.899			
V17	Hectic lifestyle.		0.890			
V18	Supplement readily available		0.878			
F3	**PHYSICAL FITNESS (α=0.908)**					
V10	Enhanced sports performance.			0.913		
V23	Good for bones.			0.896		
V12	Increased muscle mass.			0.890		
V14	Improved recovery.			0.876		
V15	Increase energy.			0.854		

Variables 1, 24, 19, 22, 7, 9, 20, 2, 8, 6, 11, 13, 5 and 21 were loaded on factor one, which were labeled as 'health & diet'. Variables 3, 16, 4, 17 and 18 were clubbed together under factor second, which was related to the consumers 'lifestyle issues'.

Variables 10, 23, 12, 14 and 15 were contributed in forming the dimension of 'physical fitness' which is the third factor.

The internal consistency among the set of items of each factor was measured by computing Cronbach's alpha for the items in each factor. The coefficients were more than 0.90 for every factor. Reliability coefficients should be equal to or more than 0.60 are reflected as good one.

A. Health and diet

The reliability of the factor 'health and diet' is 0.940 and it explains 35.85 percent of variance. This factor comprises of fourteen similar parameters related to health and diet dimension motive of users. The parameter '*To maintain health*' has 0.920 factor loading. It deals with the health objectives of individuals. Another variable under this factor is related with the heart. '*Good for heart*' has factor loading of 0.920. Another statement, "*Being diet conscious"* which put emphasis on the diet aspect of individuals and tells about the awareness of balanced diet and this statement deals with the factor loading of 0.917. Two another statements *"Good for blood circulation*" and " *To improve overall health"* deals with the health aspect and score factor loading of 0.901 and 0.898 respectively. *" Prevention of nutritional deficiencies" " Problem eating a balanced diet"* and *" To supplement poor or vegetarian diet",* these statements stress on diet related factor and tells that because of poor diet an individuals stirred to have dietary supplement food. These statements have a factor loading of 0.873, 0.862 and 0.861 respectively. Two another statements *" To improve memory"* , *"Prevent disease", "Prevention of illness", "To manage arthritis", "Post illness" and "Boost immunity"* score factor loading of 0.858, 0.852, 0.845, 0.837, 0.821 and 0.813 respectively, and these statements targets the health dimension. This factor determines that the individual's consumption of dietary supplements determined by various motives and health and diet is among those motives.

B. Lifestyle issues

The second factor 'lifestyle issues' encompasses five statements which explains 24.515 percent of variance. '*Medical advice*' has maximum loading of 0.911 on this factor. This statement focuses on that usage of dietary supplements in an individual life tenure affected by advice hunted from doctors/physicians. '*Being under stress*' has factor loading of 0.902 is another imperative parameter regarding the consumption of dietary supplement food. In today's scenario where's individuals is struggling with less of time and plenty of work load that results in stress filled life. *"Recommended by spouse/ relatives"* is another statement with a factor loading of 0.899 and this statement talks about how individual's use of dietary supplements decided by the various human being in his/her life. Another statement is "*Hectic lifestyle"* which has factor loading of 0.890 deals with the fast pacing life. *"Supplement readily available"* is the last statement of this factor tells that that easy availability of dietary supplements works as another reason for increasing requirement of this product and works as a motive of consumption. This variable has factor loading of 0.912.

C. Physical fitness

The reliability of the statements in the third factor 'physical fitness' is 0.958. This factor comprises of five statements explaining the different motives of consumption of dietary supplement that maintains or improves individual's physical fitness or endurance and covers 21.19 percent of total variance. The statement 'Enhanced sports performance' has factor loading of 0.913. Another two statements are 'Good for bones' and 'Increase muscle mass' has factor loading of 0.896 and 0.890. These statements deal with the various needs of physically dynamic person. For an athlete bone density is pertinent and good health of bone is requires for good performance and for that matter proper intake of nutrition's is foremost. 'Improved recovery' is another statement of this factor with a factor loading of 0.876 which highlights the significance of dietary supplements in fast recovery from injuries which occurred due to the participation of tedious training. Last variable of this factor is 'Increase energy' has a factor loading of 0.854. This statement put stresses on the need of extra energy for physically active person, especially for runner.

Table 4: ANOVA test statistics for age of the respondent and perceived motives of consumption for dietary supplement food

	Health and Diet	Lifestyle Issues	Physical Fitness
Levene's Statistics	3.368	1.588	0.786
Sig	0.088	0.278	0.688
F	1.607	2.207	1.138
Sig	0.265	0.03	0.250
Welch	NA	NA	NA
Sig	NA	NA	NA

Source: Primary Data

The variance across the difference age groups is homogeneous for all the factors. So, F statistic was calculated for all the factors Null hypothesis was rejected for 'lifestyle issues' dimensions, which shows the significant variances in the perception level of different age groups. The respondents of different age groups have related perception for two other factors that is 'health and diet 'and 'physical fitness' dimensions

Table 5: Comparison of dimensions of motives on the basis of age of the respondent

	Health and Diet	Lifestyle	Physical Fitness
18-30 years	3.84	2.02	3.46
31-45 years	3.70	2.89	3.58
46-60	3.99	2.68	3.33
61 and above	3.76	2.05	3.29
Total	3.82	2.41	3.41

Source: Primary Data

Middle age (31-45 years) respondents believe health and diet and physical fitness dimensions most important. 18-30 age group respondents thinks lifestyle issues factor least important than others and these respondents along with the respondents of 31-45 years of age who also consider these dimensions least important. Health and diet is the most important factor in all age groups followed by physical fitness and lifestyle factors.

Table 6: Differences of motives between the age groups on 'lifestyle issues'

Bonferroni	**Lifestyle Issues**			
Years	**18-30**	**31-45**	**46-60**	**60 and above**
18-30	-	-0.196*	-0.3107	0.219
31-45		-	0.027	-0.251*
46-60			-	-0.311
60 and above				-

Source: Primary Data

*The mean difference is significant at the .05 level.

Table 6 explains the perceptual differences between diverse age categories for the dimensions, which resulted into significant differences on applying ANOVA. The perception level of middle age (31-45 years) respondents is quite dissimilar

than young (18-30 years) and old age (above 60 years) respondents. The middle age respondents supposed lifestyle factor more important than other age groups whereas the young and aged respondents have least preference on this element.

V. Findings and Conclusion

It is visible that the mean values of the different factors for the consumption of dietary supplement food across the different categories of age shows respondents inclination towards the usage of dietary supplement food. The respondents of all categories consider the first factor 'health and diet' as the most important factor. Respondents of all categories have more positive attitude towards first and third factors as compare to second factor, where they exhibit unfavorable attitude. Respondents belongs to 18-30 age group means young respondents ($\bar{x}$ =3.46) and more than 31-45 age group (=3.58) perceive 'physical fitness' as another important factor whereas old aged respondents ($\bar{x}$ =3.29) shows less importance but the difference in the opinion is not significant.

Respondents present slightly a negative outcome towards the motive 'lifestyle issues' and considered this factor does not have much importance for the consumption of dietary supplement food. But the opinion of respondents who belongs to middle age group (31-45) differs from other two groups. The difference of views between these categories is significantly different and it is supported by the post hoc test.

Post hoc tests access the significance of mean difference between the various categories of age variable, whose effect was already reflected in the result of F test. Results of Bonferroni test reveal that the views of respondents who belongs to middle age group is significantly differ from other groups. In view of the above discussion, it can be concluded that it is ultimately the health and diet motives which matters the most for the respondents followed by the physical fitness. But results found no significant difference in the opinion of respondents for these two factors.

VI. Managerial Implication

It has been noticed that in recent times consumer becomes more conscious towards their health and diet and try to achieve healthy and balanced lifestyle. In order to achieve set target they are inclined towards nutritional food but due to hectic lifestyle and poor quality of food individuals are not able to fulfil their nutrition requirements from basic food. So fulfilling this gap people try to opting different methods and consumption of dietary supplement food is one of them that make their nutritional requirements fulfil and complete. Due to this consumption for dietary supplement food is increasing with very high pace and expected to continue in the similar drift in upcoming time. So it provides wonderful prospects to the marketers as more people are motivated towards healthy eating.

In order to grab this huge consumer base marketer must have a clear understanding and idea regarding various motives for the consumption of dietary supplement food. Current study reveals that respondents consume dietary supplement food because of various reasons like: health and diet, lifestyle issues and physical fitness. As these three aspects play an important role for selecting and consuming dietary supplement food. As most of people are now knowledgeable and more alert about their health and they are inclined towards the usage of dietary supplement food, there is very fierce competition among all supplier and marketers to capture and seize this opportunity and snatch maximum revenue. Marketer should circulate the information about the health and diet factor of dietary supplement food as this is emerged as most important motive because maximum variation is explained by this factor. Because of various lifestyle issues individuals suffer with nutrition paucity and different age group have different tendency or opinion towards this motive. There are various ways that marketer of dietary supplements covey to the peoples that dietary supplements are good for their health and fulfil their dietary needs that is a result of struggling with lifestyle issues. It is important for the marketers that they must educate people about various benefits and different aspects of dietary supplement food and make them aware and knowledgeable. Physical fitness is also an important motive for the consumption of dietary supplement for the different categories of age, although their no significant differences for this factor, but marketers have to put emphasises equally for this dimension.

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