

Consequences on Consumption of Packaged Drinking Water

S. Archana Bai, T. Vimala

Abstract: *This empirical study was conducted to examine the consequences on consumption of packaged drinking water among the consumers residing in Chennai city. Descriptive and empirical research design was adopted to gather primary information from the packaged drinking water consumers by employing non-probability convenience sampling. The primary data collected were analysed with the help of various statistical tools through PSPP software in present study. The results indicate that consumers are often exposed to various health issues due to the consumption of packaged drinking water in their day-to-day life. Fitness and Safety, Aid & Supply, Usefulness and Economic factors are the major components significantly influencing the consumer perception towards purchase decision and consumption behavior. To conclude, public health department should take the actions by visit the packaged drinking water plant area and also check the quality of water. It should be prevented to avoid the duplicate sachets of water which causes more health diseases to regular consumers.*

Keywords : *Packaged Drinking Water, Consequences, Health, Safety and Consumption.*

I. INTRODUCTION

World Health Organization (WHO) appraisal proves that above 4 million children are died from the diarrhea and fever which can be bottled up by unhealthy water. Many developed countries water is not only a basic usage food, but also a life style product (Murray & et. al., 1996). In many countries, due to non-availability of sufficient and portable water facility in all the places water was contaminated due to various reasons. The packaged drinking water are filled in sealed containers in various quantities, forms and capacity for the direct consumption of consumers. This packaged drinking water should pass the treatment process conducted by Food Safety and Standards Authority of India rules and grade quality to reach the consumers of India. According to Consumer Voice Survey 2017, Rail Neer is the top performer followed by McDowell's and Bisleri based on the result generated in microbiological test. Rail Neer considered as the value-for-money brand because of its pricing strategy. The mineral water was chemically retreated to convert as a packaged drinking water. Packaged drinking water is unhealthy and shorter shelf of life as compared to mineral

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water. The world wide has increased significantly in usage of bottled mineral water and it also become an important both factor for economic and health issues (Doria, 2006; Whelton & et. al., 2007). Natural mineral water means rising in underground water arising from the spring tapped at more natural, bore exits (Hunter, P. R. 1993; Stickler, 1989; LaMoreaux, & Tanner, 2001; Varga, 2011; Falcone-Dias & et. al., 2012; Moazeni & et. al., 2014). Bottled water has been marketed as a perfect for instant formula preparation, particularly for the immune- suppressed people. There are several insufficient clinical and epidemiological witness to conclude that the high heterotrophic counts in drinking water pose a risk to a consumers' health (Cisneros, & Rose, 2009; WHO, 2011). Nevertheless, some people can cause the diseases with the bottled water mainly among sensitive persons, like the young, the elderly, the immune suppressed population, and pregnant women.

II. PACKAGED DRINKING WATER DIVERSE FACTORS

Health: While consuming the packaged drinking water is safe and clean. The consumers are feel confident to consumed it due to the packed in a hygienic way. We discussed about the packaged drinking water because it advised by doctors and also since it has the better quality of packaged drinking water (Larson, & Gnedenko, 1999; Colford, & et. al., 2006).

Availability: In this study the perception of anyone is decided to the availability of the packaged drinking water in the market. There are plenty of opportunities are available, when the sufficient number of good branded and good quality and different quantities are available in packaged drinking water. Here there also the credit facilities are provided by the suppliers and it also available at free door delivery (Chapman, 1996; Wilkins, 1994).

Price: Here, the availability of packaged drinking water at reasonable price into the consumers. Its price should be fits into their family budget with the lowest deposit of initial amount for packaged drinking water (Güler, 2007). The bulk of packaged drinking water got some discount amount and during the time of shortage period, the suppliers would increased the packaged drinking waters' amount.

Service and Packaging: In this study the services are good from suppliers by the right time. The packaged drinking water is conveniently provided by anyone and anywhere. The consumers feels good to consumption of packaged drinking water has a good brand image and tight sealed packs

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(Klimchuk, & Krasovec, 2013; Verghese, & et. al., 2015; Ambrose, & Harris, 2017).

So the consumers may recommend this packaged drinking water to others as they are safer than other drinking water.

III. REVIEW OF LITERATURE

Doria and et al., (2009) examined the perceptions of consumers with respect to the quality and risk on the behavioural influence in the UK and Portugal. The researchers has applied the cross sectional research design to gather qualitative information through focus group interviews. The structural equation model was applied to examine the diverse factors influence on consumer behavior. The result indicates that risk, colour, flavor, quality and trust are the significant factors influencing the consumer behavior towards the consumption of packaged drinking water. The researchers suggested to adopt European-wide standards for human consumption of drinking water.

Doria (2009) conducted an empirical study to examine the factors determining the public perception towards drinking water quality in France. This study was aimed to contribute through public perception for the improvement and enhancement in the water management system, delivery of consumer services and reuse intention. The test result indicates that flavor is the most important factor influencing the quality of drinking water. In addition, water managers and policy makers are suggested to take necessary steps to overcome the potential problems and also to maintain the quality standards. Further, Doria (2011) states that the consumption of packaged drinking water was noted as high even though the quality of tap water is high in many developed countries. Further, the author also stressed that dissatisfaction on tap water and health concerns are the major factors influence public behavior.

Ogbuji and et al., (2011) conducted an empirical study to examine the Nigerians perception towards the branding of regulated bottled water in the regular consumption. The result of the empirical evidences proves that branding as a marketing strategy influences the consumer behaviour towards consumption of bottled water in Nigeria.

Sumathy (2015) has the aim of the study is to examined the Domestic Ro water and its consumers perception in District. The investigator stated the problems have made people to seek the various water treatment equipment. The researcher found that the attributes related to usage, installation and to purpose of using treated RO water and utilization of waste water. The researcher likes to identify the variations and to given the promotion policies to leverages, to achieved optimum benefits. It also provided the educate consumers about the various mode of using the waste water usefully. Then finally concluded, with that drinking water is becomes a scares and expensive commodity with increasing contaminants in making filter is essential and RO water treatment plant is badly needed in the presented study area.

IV. STATEMENT OF PROBLEM

The consumption of unsafe drinking water, are containing

with the poor water quality and cleanliness are the main subscribers to supposed the some billions cases of diarrheal diseases are yearly, causing above one million deaths, and monthly in the middle of 5years of age. The consumption water has huge quantities in this world. The risk of health should associated with the consumption of harmful water is of greatest concern. The sarcastic question is “why the health-based diseases are high in our India, still the consumers are using the packaged drinking water which is stocked in usual and hygienic manner at home?”. Therefore the analyzer has made an attempt to find out the actual awareness of consumers towards consuming the packaged drinking water in Chennai City. The study research questions are How for the consumers aware on the packaged drinking water consumption diseases?. What are the health issues identified while consuming the packaged drinking water and evaluate the consumers opinions?.

V. SCOPE OF THE STUDY

The current study attempts to examine the socioeconomic status and usage profile of packaged drinking water of the respondents to understand the life span of the population in the study area. It examines the consumers’ awareness, preference and perception and health issues towards packaged drinking water. Further it examines the opinions about the packaged drinking water consumption and determinants of dimensions of the packaged drinking water consumption by the consumers based on their selected socioeconomic status. The present study is from the standard point of the consumers’ awareness of packaged drinking water in the Chennai City.

VI. OBJECTIVES OF THE STUDY

The major aim of the present study is to explore the consequences on consumption of packaged drinking water and also to study the consumers’ awareness on packaged drinking water consumption diseases and determine the dimensions of packaged drinking water consumption.

VII. METHODOLOGY

Methodology adopted for the study; primary data was collected by in-depth interview of the respondents through structured questionnaire. The survey questionnaire started with respondents demographic profile and ended with variable specific Questions related to consumers perception towards packaged drinking water, followed by the questions measuring the opinion of packaged drinking water consumption, a ranking question regarding the situation of consumers consumes package drinking water, multiple response regarding packaged drinking water brand preference followed by variables measuring the dimension of consumers packaged drinking water consumption on consumers opinion about the packaged drinking water were asked through a five point Likert scale where 1 stands for

“strongly disagree” , 5 stands for “strongly agree”. The sample size was 223 and convenience sampling technique had been used to collect the primary data from respondents. After the data has been collected, it was processed using Microsoft Excel for coding and SPSS version 23.0 software package was used for the following analysis.

VIII. RESULTS AND DISCUSSION

Table 1: Demographic Profile of Packaged Drinking Water Consumers

Demographic Profile (N = 223)	Frequency	Percent
Age		
Between 15 to 25 Yrs	124	55.6
Between 26 to 35 Yrs	54	24.2
Between 36 to 45 Yrs	30	13.5
Above 46 Yrs	15	6.7
Gender		
Male	104	46.6
Female	119	53.4
Educational Status		
School level	15	6.7
Graduate	124	55.6
Post – Graduate	59	26.5
Professional and Others	25	11.2
Occupation		
Self Employed	20	9.0
Salaried	115	51.6
House Wife	11	4.9
Others	77	34.5
Monthly Income Level		
Below Rs. 10,000	95	42.6
Rs.10,000 – Rs.30,000	90	40.4
Rs.30,000 – Rs.60,000	28	12.6
Above Rs.60,000	10	4.5
Area of living		
Urban	173	77.6
Semi – Urban	50	22.4
Family Type		
Nuclear Family	129	57.8
Joint Family	94	42.2
Marital Status		
Married	95	42.6
Un Married	128	57.4

The above results reveals that the 223 respondents,

Majority of the respondents are Female 53.4%, 55.6% of the respondents belongs to the age group of 15-25, 55.6% of the respondents are Graduates, 57.4% of the respondents are Unmarried, 51.6% of the respondents are Salaried persons, 42.6% of the respondents get Monthly Income is Below Rs.10,000, 77.6% of the respondents are living in Urban area, and 57.8% of the respondents Family is Nuclear type.

Table 2: Consumer Perception on Packaged Drinking Water Consumption

Consumer Perception on Packaged Drinking Water Consumption	Frequency	Percent
How often do you drink Packaged Drinking Water (PDW)?		
Every day	78	35.0
3-5 Times a Week	23	10.3
Once a week	31	13.9
Occasionally	91	40.8
Quantum of Packaged Drinking Water Consume?		
Below 500ml	70	31.4
500 ml to 1 ltr	43	19.3
1 ltr to 2 ltrs	42	18.8
2 ltr to 5 ltrs	41	18.4
5 ltr to 20 ltrs	27	12.1
How long you have been consuming Packaged Drinking Water?		
Recently 5 Months Before	78	35.0
1 Year Back	38	17.0
1 to 3 Years Back	46	20.6
More than 3 years Back	61	27.4
What is the frequency of buying Packaged Drinking Water per month?		
Below 5 times	112	50.2
6 to 10 Times	52	23.3
10 to 15 times	41	18.4
More than 15 times	18	8.1
The feel after consuming the Packaged Drinking Water regards your health condition?		
Good	79	35.4
Safe	29	13.0
Some Affects	31	13.9
Don't know	84	37.7
The effects of frequent usage of Packaged Drinking Water?		
Improves Health	33	14.8
Affects the health	57	25.6
Don't know	133	59.6
How much amount you spent for consumption of PDW per month?		
Less than Rs.500	145	65.0
Rs. 501 to Rs.1000	47	21.1
Rs. 1001 to Rs.1500	25	11.2

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Above Rs.1501

6 2.7

The consumer perception of packaged drinking water is, 40.8% of the consumers are often to drink Occasionally, and 31.4% of the consumers are consumed the packaged drinking water Quantum is Below 500ml per day. 35% of the consumers consumed the packaged drinking water' during level is in Recently 5 Months before.

The frequency of the buying packaged drinking water per month is only Below times on the percentage of 50.2%, 37.7% of the consumers they don't know about feet of their health condition by after consumption of packaged drinking water, and also 59.6% of the consumers don't know about their frequent usage of packaged drinking water's effects after the consumption, and 65% of the consumers are spent the amount is less than Rs.500 for the consumption of packaged drinking water per month.

Table 3: Health Issues while consuming the Packaged Drinking Water

Health Issues while consuming the Packaged Drinking Water	Mean	Std. Deviation	Skewness (S.E = 0.163)	Kurtosis (S.E = 0.324)
Fever	1.87	1.035	.936	-.080
Stomach Upset	1.82	.999	.924	-.042
Vomiting	1.56	.947	1.604	1.605
Headache	1.77	1.018	1.284	1.102
Allergy	1.63	1.004	1.464	1.255
Diarrhea	1.54	.952	1.629	1.617
Tooth decay and Gum damage	1.70	1.055	1.417	1.161
Diabetes	1.34	.771	2.596	6.757
Obesity	1.51	.981	1.946	2.984
Typhoid	1.70	1.096	1.398	.965

The descriptive statistics result reveals that among the Health issues of the consumers while consuming the packaged drinking water. A total of 223 respondents, mean values are seen, 1.87 most of the consumers are suffering Fever while consuming are suffered by the stomach upset.

Table 4: Determinants of Packaged Drinking Water Consumption on Consumer Opinions

Dependent Variable	Significant Predictors	No. of Items	Mean (SD)	F-Value	R	R2	Adjusted R2	β (t-Value)	Sig.	Collinearity Statistics	
										Tolerance	VIF
Consumer Opinions		18	53.70 (13.11)	177.52 (0.000)	0.842	0.709	0.705				
	Fitness and Safety	9	28.22 (7.506)					0.592 (10.152)	<0.001**	0.391	2.555
	Aid & Supply	8	25.65 (6.619)					0.176 (2.953)	<0.003**	0.373	2.681

The balance of the consumers are also have the lots of health issues are, 1.77 of suffering with Headache and 1.70 of suffering with the Tooth Decay, and Typhoid. They also have the Allergy is 1.63, Vomiting 1.56, Diarrhea is 1.54, Obesity is 1.51, and 1.34 of the consumers suffered by Diabetes

DETERMINANTS OF PACKAGED DRINKING WATER CONSUMPTION ON CONSUMER OPINIONS

The consumer opinion on packaged drinking water consumption (dependent variable) might be predicted from dimension of packaged drinking water consumption with respect to fitness & safety, aid & supply, usefulness and economic (independent variables).

The multiple regression ordinal least square empirical result indicates R = 0.842, R Square = 0.709, Adjusted R square = 0.705, Std. Error of the estimate = 7.123. This implies that the independent variables with respect to Fitness and Safety, Aid & Supply and Usefulness create 70.9% influence over the dependent factor of consumers' opinion of packaged drinking water consumption with respect to kind of product, protection from harm, convenient and support. This leads to further verification of the regression fit as stated in the ANOVA table. Also found that F = 177.520 and p < 0.01 are statistically significant at the 5% level. Therefore it is concluded that independent variables with respect to dimensions of packaged drinking water consumption are good enough to have an explorative power of consumers prefer packaged drinking water.. The good regression fit indicates the existence of individual influence over the dependent factors with respect to dimensions of packaged drinking water such as Fitness and Safety, Aid & Supply and Usefulness. From the table it is explore the Coefficients result value of Fitness and Safety (t = 10.152, β=0.592, p < 0.01), Aid & Supply (t=2.953, β=0.176, p < 0.01) and Usefulness (t=3.136, β=0.153, p < 0.01) are statistically significant at 5% level.



Usefulness	5	16.73 (5.242)	0.153 (3.136)	<0.002**	0.560	1.786
Economic	3	8.57 (2.761)	0.068 (1.591)	0.113	0.726	1.378

Constant with t value of 9.181 at P Value of <0.001* - (Economic was not significant influencing the customer opinion towards packaged drinking water)

Notes: *** Significant @ 1% level, *Significant @ 5% Level.

Furthermore, there is an insufficient influence of consumers opinion packaged drinking water consumption by economic ($t=1.591$, $\beta=0.068$, $p > 0.01$) are not significant at 5% level. Therefore it is concluded that dimensions of packaged drinking water consumption with respect to Fitness and Safety, Aid & Supply and Usefulness highly influences of consumers' opinion of packaged drinking water consumption.

IX. IMPLICATION AND CONCLUSION

- The respondents should check the information on the packaged drinking water labels clearly. Because, it is the nature of perishable. So the manufacturer should given the clear visible information of the manufacturing date, expiry date and other information of the packaged drinking water.
- Only the few consumers feel the positive consumption as they are germs free. So, consumers should need to know about the usage consequences, life and chemical aspects of packaged drinking water.
- The respondents have no idea about the effects of packaged drinking water. When they consumed the packaged drinking water, they suffered lots from Health issues of fever, typhoid, vomiting, diarrhea, etc., So, the consumers should have awareness on the consumption of packaged drinking water and its positive and negative effects on the health.
- The Health department should take the actions by visit the packaged drinking water plant area and also check the quality of water. It should be prevented to avoid the chemically treated water which is not suitable for regular human consumption.

The packaged drinking water was playing a substantial role into the society, because, the lack of the clean drinking water. In this study, the majority of the consumers have no adequacy awareness of the packaged drinking water issues. They do not know about the effects of the packaged drinking water while they consumed. The respondents do not given any complaints against the lesser quality of packaged drinking water with written way. They give only oral complaints to the retailers. But the retailers did not give any importance to their complaints and simply they ignored it. Because, of their increase profit. The consumers should check the other information on the packaged drinking water and also check the manufacturing date, expiry date, and ISI mark and other information also. To immediately inform the Health department if any problems are rises means. The Health department also should take steps to the complaints

about packaged drinking water and also should regulate the production and sales. Majority of the consumers consumed the packaged drinking water while during travel time. Too much consumption of packaged drinking water also affects the health. The packaged drinking water's details must be printed in a visible way clearly, and the Food and Drug Administration department should take a surprise visit to production and sales plant to make secure the quality of packaged drinking water. The people still not having the aware source of life (water). Therefore the government and manufacture should improve the awareness of the people through media like Television, Radio, Advertisement and other way like Pamphlets, Balloons, etc.,. The government should also give the awareness about the issues related to packaged drinking water consumption through social advertisements.

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