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Original Research Article

Analysis of Hygienic and Satisfaction Level of Restaurant Food in North Region

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ABSTRACT

The quality of food is of main concern today due to their popularity and ease of availability. It fulfills the requirements of large population. But the food safety and sanitation is also a very important aspect. A Questionnaire of eight questions was prepared & people were asked to fill it according to their experience with restaurant foods. A descriptive analysis on the data generated was done and results were interpreted. Serious food poisoning is linked with unhygienic food consumption. Lack of Knowledge among people as well as vendors is the main cause of food borne diseases. This study is related with unhygienic conditions of restaurant food.

Keywords: food, Food borne diseases, one sample T-test, ANOVA test.

INTRODUCTION

Restaurant food is of great choice these days as people are keener towards the taste and ready to eat foods. The choice of food varies from place to place, country to country and even community to community .In country like India there are many cultures and community that are coexisting, so as the variety of food (Sneh *et al.,).*Food industry plays an important role in fulfilling the requirements of large number of people and easily available. As well as this industry is a good source of income for many numbers of people. Customers select the restaurants on the basis of many factors like price, location, food quality and hygiene. Out of this hygiene and food quality are the most important factors to be chosen by a customer. (Yoon JY *et al.,* 2003). FDA (Korean, 2007) has reported some results which show a huge outbreak of food borne diseases with 9,686 patients. Gordon-Davis (2011) has found the most common food poisoning bacteria as *Salmonella, Staphylococcus aureus, Clostridium perfringens, Bacillus cereus, Escherichia coli (E.coli)* and *Clostridium botulinum,* with *Salmonella* being the most common.

Bryan *et al.,*1978 and Koopmans *et al.,*2004 reported the food borne poisoning is linked with the unreliable raw material sources, improper cooking, cross contamination from other food stuffs as well as poor hygiene of personal handing. In order to enhance the food quality as well as food safety, the knowledge of vendors as well as customers regarding the above said points should be developed and improved according to recent survey reports for street as well as restaurant foods (FAO, 1995). Increasing demands for safer food products led to development of new market (Golan *et al.,* 2004). There are many restaurants who serve the food with unhygienic practices (Andrew *et al.,* 1989). Health education programs should be organized to reduce to reduce the transmission of food borne diseases (Maizun *et al.,* 2002). Foods and

drinks include many chewing substances and their ingredients (Food Act 1983). Cross contamination due to improper procedures like improper washing of vegetables is a big concern today for food organizations (Anderson *et al.,* 2004). The study conducted by Anne Wilcock and coworkers in 2004 showed that proper guidance is required to consumers for safety issues by experts of the industry. Food contamination leads to severe problems like diarrhea in children (Avita *et al.,* 2010). Centre for disease control and prevention reported hand washing as the most concerned and important hygienic practice to be followed by the people to avoid illness (Lin *et al.,* 2003). According to survey conducted by Sudershan and coworkers in 2008, the knowledge of food and its labels is almost negligible in customers which are the main cause of food poisoning among them. In a study conducted by Geetika *et al.,* 2016, it was revealed that the taste and mouth feel sensations are the main factors influencing the preference to choose a particular drink for the consumers. The study also derived that there is a need to formulate certain strategies to increase the consumption of health drinks among young consumers.

Study Objectives:

The present study put emphasis on

1. Hygienic practices and their link with food borne diseases.
2. Influence of various factors on vendors as well as customers

MATERIALS AND METHODS

Participants:

Mainly adolescents were targeted for the collection of data as they are keener towards the restaurant food. More over the sample size of 140 students were collected to determine their choices for restaurant food and awareness about the hygiene of that food. This research took a period of one month during which data was collected from the field, organized, analyzed and presented in analytic form.

Questionnaire:

The study employed the use of self-prepared questionnaire to collect the required primary data. Sampling is necessary because population interest is large, diverse and scattered over a large geographic area (Sneh *et al.,* 2016). Simple random sampling method was used to collect the data. A questionnaire consisted of a number of questions in a definite order on a form or set of forms. The questionnaire consisted of both structured and semi structured questions.

Parameters Included:

The Eight parameters were chosen in order to evaluate taste as well as the hygienic choice of population enlisted below.

1. Cleanliness in terms of use of gloves, dustbin, hair cap
2. Hygiene of staff
3. Ingredients of food (Whether fresh or not)
4. Preservation of food
5. Food Quality (Oil free)
6. Genuine price according to food
7. Surroundings
8. Popularity of place

Analysis of Responses:

Statistical analysis: Data was analyzed by using statistical package for social science (SPSS) for windows version 7.0 (IBM SPSS 20.0) for descriptive statistics (mean, frequency and percentages) of the data. One sample T test was also employed to determine the dependence of dependent variable on independent variable. Dependent variable regression was analyzed by using ANOVA test.

Descriptive statistics: It is a tool which is used to provide the geometric face of traits of the data in a study. They provide simple summaries about the sample and the measures.

Skewness: It is a factor used to describe the uniformity and consistency of data. The Skewness for a normal distribution is zero and Skewness for symmetric is near zero. Negative values indicate data has skewed left and positive value indicates that data has skewed right.

Kurtosis is a measure of normal and abnormal distribution of data. That is, data sets with high kurtosis tend to have heavy tails, or outliers. Data having high kurtosis will have a heavy tails and vice versa.

Regression:

Regression analysis is a statistical process used for determining the relationships among variables. It mainly focus is on the relationship between a dependent variable and one or more independent variables

ANOVA (Analysis of variance)

ANOVA is a data analysis method used to test the equality of all groups in a study. One-way and 2-way ANOVA are forms of this technique (Gaddis 1998). ANOVA is presented as a widely used for assessing the performance of two or more groups on a wide range of dependent variables as well as independent variables. It was devised originally to test the differences between several different groups of treatments (Snedecor and Cochran, 1980).

One sample t-Test and Factor Analysis:

The one-sample t-test is used to determine the sample mean and their variances. Factor analysis is a method of data reduction. Factor analysis is a technique that requires a large sample size. Factor analysis is based on the correlation matrix of the variables involved.

RESULTS AND DISCUSSION

Descriptive Analysis:

Descriptive method of analysis was used to explore various factors of hygienic conditions of restaurant food which effects on the different questions regarding factors of hygiene. In the data shown in table 1, values of Mean clearly shows that respondents are agreed with the fact that hygienic factors do impact their performance, except in the case of price where means lies at 2.6 where respondents are neutral or disagree with the variable. Standard deviation of the above data is almost 1 case of maximum variable which support that data is normal. Skewness of the collected data also shows that data values are normal which signifies that the response of the participants is not skewed either positively or negatively. The response of respondents is forming a particular group which determines that they are agreed in same manner.

Table-1-Descriptive statistical analysis

Statistics									
		Cleanliness	**Hygiene**	**Ingredients**	**Preservation**	**Food Quality**	**Genuine Price**	**surroundings**	**Popularity**
N	Valid	140	140	140	140	140	140	140	140
	Missing	0	0	0	0	0	0	0	0
Mean		1.86	2.11	1.99	2.36	2.04	2.69	2.26	1.94
Median		2.00	2.00	2.00	2.00	2.00	3.00	2.00	2.00
Std. Deviation		.845	.882	.929	1.011	.843	.968	.964	1.044
Skewness		.932	.475	.575	.376	.662	-.056	.374	1.000
Std. Error of Skewness		.205	.205	.205	.205	.205	.205	.205	.205
Kurtosis		.858	-.125	-.369	-.589	.419	-.421	-.358	.301
Std. Error of Kurtosis		.407	.407	.407	.407	.407	.407	.407	.407
Percentiles	25	1.00	1.00	1.00	2.00	1.00	2.00	2.00	1.00
	50	2.00	2.00	2.00	2.00	2.00	3.00	2.00	2.00
	75	2.00	3.00	3.00	3.00	2.75	3.00	3.00	2.75

The method of Pearson correlation was used to depict interdependency of variables on each other. The ingredients are correlated to hygienic conditions to the extent of 50%.lls about the association of variables. Positive correlation was observed with each other.

Regression:

Model Summary				
Model	**R**	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**
1	.679[a]	.461	.433	.762

Above table is showing regression analysis in which hygienic conditions of restaurant food has been taken as dependent factor and others as independent factors. Dependent factor is regressing by 76%.This table provides the *R* and *R*2 values. The *R* value represents the simple correlation and is 0.67 (the "R" Column), which indicates a high degree of correlation. In this case, s of 76.2% satisfaction can be explained, which is very large.

Table-2 Showing Pearson Coefficient of Correlation

Correlations									
		Cleanliness	**Hygiene**	**Ingredients**	**Preservation**	**Food Quality**	**Genuine Price**	**Surroundings**	**Popularity**
Cleanliness	Pearson Correlation	1	.630**	.382**	.406**	.411**	.191*	.241**	.162
	Sig. (2-tailed)		.000	.000	.000	.000	.024	.004	.056
	N	140	140	140	140	140	140	140	140
Hygiene	Pearson Correlation	.630**	1	.432**	.502**	.488**	.127	.421**	.179*
	Sig. (2-tailed)	.000		.000	.000	.000	.136	.000	.034
	N	140	140	140	140	140	140	140	140
Ingredients	Pearson Correlation	.382**	.432**	1	.557**	.533**	.091	.406**	.281**
	Sig. (2-tailed)	.000	.000		.000	.000	.285	.000	.001
	N	140	140	140	140	140	140	140	140
Preservation	Pearson Correlation	.406**	.502**	.557**	1	.542**	.101	.360**	.353**
	Sig. (2-tailed)	.000	.000	.000		.000	.236	.000	.000
	N	140	140	140	140	140	140	140	140
Food Quality	Pearson Correlation	.411**	.488**	.533**	.542**	1	.225**	.333**	.297**
	Sig. (2-tailed)	.000	.000	.000	.000		.007	.000	.000
	N	140	140	140	140	140	140	140	140
Genuine Price	Pearson Correlation	.191*	.127	.091	.101	.225**	1	.043	-.011
	Sig. (2-tailed)	.024	.136	.285	.236	.007		.611	.899
	N	140	140	140	140	140	140	140	140
Surroundings	Pearson Correlation	.241**	.421**	.406**	.360**	.333**	.043	1	.308**
	Sig. (2-tailed)	.004	.000	.000	.000	.000	.611		.000
	N	140	140	140	140	140	140	140	140
Popularity	Pearson Correlation	.162	.179*	.281**	.353**	.297**	-.011	.308**	1
	Sig. (2-tailed)	.056	.034	.001	.000	.000	.899	.000	
	N	140	140	140	140	140	140	140	140

ANOVA

ANOVA[a]						
Model		**Sum of Squares**	**Df**	**Mean Square**	**F**	**Sig.**
1	Regression	65.560	7	9.366	16.143	.000[b]
	Residual	76.583	132	.580		
	Total	**142.143**	**139**			

From Above value it can be interpreted that dependent variable is regressed by 65% & the value is significant because ANOVA results reveal the significance ≤ 0.05..Here, $p < 0.000$, which is less than 0.05, and indicates that, overall, the regression model statistically significantly predicts the outcome variable (i.e., it is a good fit for the data).

Coefficients[a]					
Model	**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**
	B	**Std. Error**	**Beta**		
(Constant)	.277	.268		1.037	.302
Food Quality	.263	.100	.219	2.635	.009
Genuine Price	-.009	.069	-.009	-.133	.894
Surroundings	.029	.079	.028	.369	.713
Popularity	.152	.067	.157	2.260	.025
Ingredients	.302	.088	.278	3.434	.001
Hygiene	.236	.105	.206	.649	.026
Cleanliness	.059	.102	.049	2.577	.565

From above data it can be interpreted that Variable 002, 005, 006, 007 has greater impact on dependent variable (variable 2) than others. Based on above data, the parameters food quality Popularity, Ingredients and cleanliness have maximum impact on the food choice as well as the hygienic conditions of restaurant food

Factor Analysis

Factor analysis was done to extract and club the factors of hygiene of street food. KMO and Bartlett's test is used as correlation matrix.

KMO and Bartlett's Test[a]		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.671
Bartlett's Test of Sphericity	Approx. Chi-Square	120.266
	Df	21
	Sig.	.000

An examination of the Kaiser-Meyer Olkin measure of sampling adequacy suggested that the Sample was factorable (KMO=.671) which shows that results are reliable. Bartlett's Test of Sphericity Approx. Chi-Square used to test if samples have equal variances that are homogeneity of variances.

DISCUSSION AND CONCLUSION

From above study it can be concluded that the variables food quality, Popularity, Ingredients and cleanliness affects the hygiene conditions of street food actually. The restaurant food plays a significant socio economic role in terms of employment potential and in serving the food at reasonable prices to the lower and middle-income. 75% of population is bothered about the cleanliness, 59% of population is aware the sources from which the material is being prepared. Being from India a developing country people are more conscious about the pricing of street food, so 80 percentage of population is concerned about the price of street food. As our results are normal, we can generalize and summarize our results that our sample represents the whole population. The reliable results are obtained with our sample so further factor analysis can be and other tools for more details can be implemented. Similar findings are obtained by Sudershan *et.al.*in 2008 during their survey.

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