Factors Influencing Customer Satisfaction in Bangalore Shopping Malls: Before & During COVID – 19 Pandemic

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Abstract

Retail sector is an important contributor to the country's GDP in any economy. It is observed that this retail market in the country is growing rapidly. Shopping malls are one of the major parts in organised retail sector. The growth of shopping malls is depending on the number of customer visits. The customers are visiting the shopping malls to purchase products. An increase in the number of visits indicates the better performance of the sector. On the other side, number of customer visits to the malls depends on customer satisfaction in the malls. These shopping malls perform many activities to attract the customers. In the present study, it is proposed to determine the factors which lead to customer satisfaction. Among the many factors, the study considers five major factors which determine the customer satisfaction. The shopping malls are badly affected by COVID – 19 virus. The satisfaction level of the customer may be different in two time periods, before pandemic and during pandemic. Here, we used multiple regression analysis to estimate the effect of these shopping mall activities on customer satisfaction in both the periods. A step-wise regression analysis is also carried out. It is also proposed to test the significance of the differences in means of the selected shopping malls activities between the two time periods.

Keywords – COVID -19, Customer Satisfaction, Pandemic, Retail, Shopping Malls

Introduction

Retail sector in India is transformed as one of the fast growing and dynamic part due to the entry of many new players. It has become a leading global destination in the retail sector. Organised retail in the country is growing quickly and shift of the unorganised retail towards organised retail is happening rapidly. Urbanization is also making the growth of organised retail. Shopping malls are playing key role in the growth of organised retail sector.

According to the Retailers Association of India (RAI), the retail industry achieved 93% of pre-COVID sales in February 2021; quick service restaurants and consumer durables increased by 18% and 15% respectively. After a sharp decline of 19% in 2020 (January – March quarter), the FMCG sector slightly recovered in July-September 2020 quarter with a year on year growth of 1.6%. The growth displayed in the FMCG sector was also a indication of positive growth in the overall macroeconomic perspective amid reopening of the economic activity and easing of the restrictions kept during lockdown.

The retailers in the shopping malls operate in a highly competitive environment. They require effective management to satisfy the customers. The shopping is a regular activity in people's lives and it is evolving and exploring multiple options. Proper investigation and taking the decision is important aspect to have a pleasant shopping experience to achieve satisfaction. The study of consumer behaviour is not recent. Flatters and Willmott (2009) study identified that consumers try to maximise their utility, joy or satisfaction by purchasing consumer goods. Since 1950s, the emotional and rational contexts of consumption have been studied. Different shopping motivations were proposed, combining multiple motivations into two types, namely, utilitarian and hedonic motivations. Shopping motivations were deeply studied in consumer behaviour in shopping over the past decades (Wagner & Rudolph, 2010). Shopping mall customers visit shopping malls not only to explore and purchase products but also they visit for entertainment. They feel it is an entertainment activity that

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provides pleasure and fun (Kim, Lee & Kim, 2011). Shopping mall visitors also engage in various other activities when visiting shopping malls (Farrag, El Sayed and Belk, 2010). According to Kim, Lee and Suh (2015) it has already become a lifestyle to the customers to purchase products while spending time in a shopping mall. It includes a combination of both culture and shopping, rather than just going to a shopping mall only to purchase goods. Hunneman, Verhoef and Sloot (2017) proved that visitors tend to assess store attributes in different ways depending on the type of shopping trip.

During the COVID – 19 pandemic there are certain changes in the consumer behaviour and changes were noticed in a shopping pattern in retail sector comparing to the pre pandemic scenario. It has brought some change in the way of achieving customer satisfaction in the shopping malls. Understanding the changes occurred in achieving Customer satisfaction in Pre pandemic and during pandemic scenario is important for the sustainability and to adapt accordingly. It led authors' interest to explore consumer behaviour before and during COVID-19.

Literature Review

Alya Zulfa Cahyani (2021) studied and proved that application of price and promotion in shopping malls to achieve customer loyalty and taking the buying decisions as a moderator is significant. This study also explained the implications to save the retailers, who are not functioning at present, suitable suggestions were given to the retailers to improve their methods of marketing by providing the goods and services with competitive prices, discounts etc to safeguard the customer loyalty.

Salma. Akter, Taj Ashrafi, Victoria Waligo (2021) made a detailed research on pandemic impact on consumer behaviour, consumption and purchase behaviour in a developing country such as Bangladesh. The results of the study strongly indicated that the safety and health concern, financial condition, imposed restrictions, and other realities caused a noticeable shift in consumer purchase behaviour.

Vilas Chauhan and Heer Shah (2020) made a detailed study on consumer behaviour, Sentiments and consumption habits during pandemic and identified that 76.5% respondents believed that COVID – 19 pandemic brought a change in their consumer behaviour and 23.5% felt that there is no impact of pandemic on their purchase behaviour and also observed that on an average 52.2% of the respondents felt that there is a change in their shopping pattern. Through the observations of the study, authors came to a conclusion that the primary impact of pandemic was evident on delay purchases, non-availability of products were observed at the retail outlets from where the purchase was intended, Purchase of alternative product and stock piling to avoid shortage in future.

Eger, L., Komárková, L., Egerová, D., &Mičík (2021) made an extensive research on Generational perspective on consumer behaviour during pandemic to understand the impact and trend of purchase behaviour during corona pandemic. The results of the research indicated the change in consumer behaviour patterns at the beginning of the second wave of the pandemic in Czech Republic. The conclusion of the study stated that there are similarities and also some significant differences noticed in consumer behaviour among the generations. The top three customer purchase reasons were availability, quality and convenience.

Moon, J., Choe, Y., & Song, H. (2021) observed that major variables that influenced the consumers' selection of offline distribution channels or online shopping channels were social distancing, recognition of government policy, attitude toward COVID-19 and subjective norm. Consumers who had negative attitudes toward COVID-19 pandemic believed that the people around them might respond to their behaviours negatively indicated that they would use more online instead of offline shopping channels.

Bidyut Jyoti Gogoi (2021) made a study and found that Firm's need loyal customers to sustain in tough competition and uncertainty. Customer satisfaction plays a big role in creating a pool of loyal customers. The loyal customers are needed also to voice out for the company products and services. Customer loyalty also helps in creation of positive brand image. Brand reputation helps the firm to stand out even during tough times. The Covid19 pandemic has brought several changes in the way consumer behaves towards a brand. The brand strategies have also undergone changes to meet the consumer requirements.

In previous studies, researchers focused on consumer behaviour in shopping malls in various places. They concentrated on demographics, economic factors, etc. Efforts are not made to study the consumer behaviour in malls during pandemic period and the comparative studies between the two periods, before and during the COVID – 19 pandemic. The present study is aimed on this dimension and also to study the identified factors influence on consumer satisfaction in malls in Bangalore. Further, the significance of the mean differences in factors between the two periods is also studied.

Objective of the study

To analyse the determinants affecting the customer satisfaction in shopping malls, before and during COVID – 19 pandemic and to test the significance of

the differences in selected determinants between the two time periods.

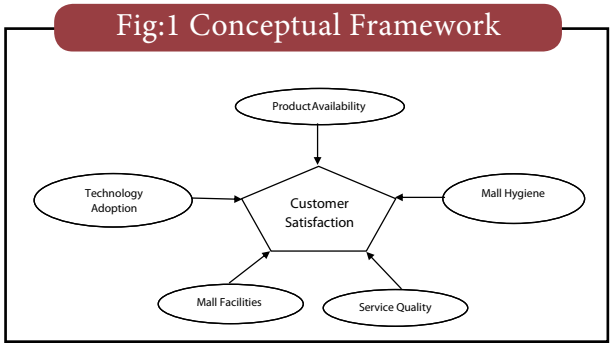
Hypothesis:

There is no significant effect of selected factors on customer satisfaction and also the difference is not significant in factors between the two time periods.

Methodology

The present research study 'Factors Influencing Customer Satisfaction in Bangalore Shopping Malls: Before & During COVID – 19 Pandemic' is totally based on primary data collected through both online and offline method. A pre-tested questionnaire was used to collect the required information. The questionnaire was tested for its reliability with the help of Exploratory factor analysis and Confirmatory factor analysis. The customer satisfaction in shopping malls is determined by number of factors. Among these factors, the researcher selected some factors which are assumed to be significantly influenced the consumer satisfaction. To satisfy the objectives, we establish a functional relationship with these selected factors and customer satisfaction.

Fig:1 Conceptual Framework



A Multiple Regression Analysis was adapted to fulfil the objective, where it is suitable to establish the relation. It is possible to test the collective effect of factors on customer satisfaction and also possible to identify each individual factor effect is significant or not. It is identified that the factors which are affecting the customer satisfaction are: Product Availability (PA), Mall Hygiene (MH), Service Quality (SQ), Mall Facilities (MF), Technology Adoption (TA) on Customer Satisfaction (CS). The proposed functional form is

CS = f {PA, MH, SQ, MF, TA} ------- 1

The above functional relationship was estimated for both the periods before and during COVID – 19 outbreak situations. The specific equations of above functional form for the two periods are:

BCS = {a0 + a1BPA + a2BMH + a3BSQ + a4BMF + a5BTA} ---------- 2

DCS = {b0 + b1DPA + b2DMH + b3DSQ + b4DMF + b5DTA} -------- 3

The collected data was assigned to the above two equations in an appropriate form and the equations are estimated by using Ordinary Least Squares Method. To estimate the regression coefficients and its relevant statistics (Standard Error values, t – values, Value of Multiple relation and F – Values) we adopted SPSS package. The value of multiple correlation coefficient (R2) reveals the collective effect of all independent factors on consumer satisfaction. The significance of R2 is identified through F – test statistic.

The t – test statistic is helpful to detect the significance of each independent factor on consumer satisfaction.

It is also proposed to identify the significance of the differences in each of the selected factors in between two periods. Z – test statistic is adapted since the sample is a large sample.

$$|z| = \frac{|x_1 - x_2|}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}}$$

Where x_1, x_2 are means of factors in two periods.

s_1^2, s_2^2 are variances of factors in two periods.

n_1, n_2 are sample sizes in two periods.

Limitations of the study

The present study is confined to malls in Bangalore city only. The data was collected from shopping mall visitors in the city through pre tested questionnaire in both online and offline modes. The outcomes of the study are not generalized, it may vary from one geographical area to other geographical area. This study was conducted for the period of three months.

Data analysis

I. Exploratory Factor Analysis:

Table: 1 KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		**.928**
Bartlett's Test of Sphericity	Approx. Chi-Square	10527.475
	df	435
	Sig.	.000

The test to check the sample adequacy is Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy statistic. Table 1 presents the KMO and Bartlett's Test results. It is known from the test results that the calculated KMO value of the present study is 0.928 which is > 0.5 denotes that the sample taken for the study is meritorious (Hair et al., 2008). The Sphericity value of Bartlett's Test is significant i.e.< 0.05 indicating that the correlation matrix is significantly different from an identity matrix, in which correlations between variables are all zero. Hence, Factor analysis is considered as an appropriate technique for further analysis of the data. The Principal Component Analysis extraction method was used to extract the communalities. The extracted values of the factors through the Principal Component Analysis are greater than 0.5. It clearly indicates that the factors considered for the study are relevant. The Eigen Values extracted from the test are greater than one. It clearly indicates that the tested questionnaire is perfectly fit for the study.

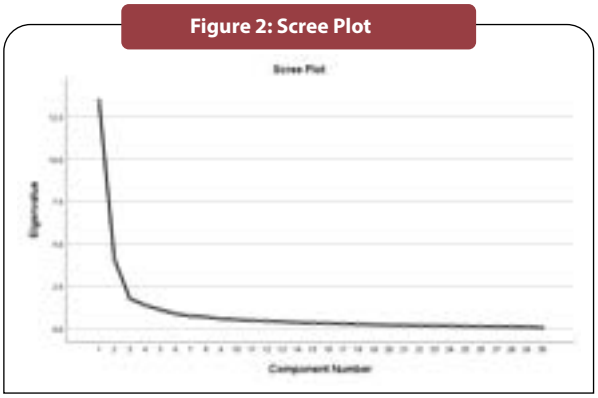
Table: 2 Component Correlation Matrix

Component	1	2	3	4	5
1	1.000	.280	.632	.588	.573
2	.280	1.000	.196	.264	.250
3	.632	.196	1.000	.640	.516
4	.588	.264	.640	1.000	.467
5	.573	.250	.516	.467	1.000

Extraction Method: Principal Component Analysis. Rotation Method: Promax with Kaiser Normalization.

A correlation matrix was constructed to identify inter-item correlation. If any value of inter – item correlation is greater than 0.75, the concerned factor may be altered. In the present study all the inter – correlated values are less than 0.75. (Table – 2). Hence, the factors considered in the present study are exhibiting the reality.

Figure 2: Scree Plot



The figure - 1 shows the Cattell's Scree plot for factor extraction. It is derived by plotting the Eigen values against the number of factors in their order of extraction and the shape of the resulting curve shows the cut-off point to evaluate the extracted factors.

The adopted talent route (Kaiser's criteria) and Scree test criteria explained that five factors are extracted as ideal.

II. Confirmatory Factor Analysis:

The measurement model was assessed with absolute fit indices like Chi-square/df, Goodness of Fit (GFI), Adjusted Goodness of Fit Indices (AGFI), Normed Fit Indices (NFI), Relative Fit Indices (RFI), Incremental Fit Indices (IFI), Tucker-Lewis Fit Indices (TLI), Comparative Fit Indices (CFI), Root Mean Square Error Approximation (RMSEA).

Table: 3 Model fit measures

Measure	CMIN/DF	GFI	AGFI	NFI	RFI	IFI	TLI	CFI	RMSEA
Estimate	4.704	0.966	0.942	0.912	0.955	0.962	0.988	0.952	0.053
Threshold	1 and 5	>0.90	>0.90	>0.90	>0.90	>0.90	>0.95	>0.95	<0.06

The above table shows that all the measures of the construct show a reasonable level of acceptability and 96.6% (GFI0.966) of the variation was explained by the model (Hair Jr. et al., 2014).

Table: 4 Reliability and Convergent Validity

	Std. Estimate	S.E.	Critical Ratio	P	Construct Reliability	AVE
MF1 <--- M_F	.891					
MF2 <--- M_F	.859	.038	24.135	***		
MF3 <--- M_F	.869	.039	25.078	***		
MF4 <--- M_F	.865	.040	24.855	***	0.956	0.757
MF5 <--- M_F	.873	.039	24.963	***		
MF6 <--- M_F	.894	.037	26.378	***		
MF7 <--- M_F	.838	.041	23.004	***		
SQ1 <--- S_Q	.791					
SQ2 <--- S_Q	.812	.057	16.386	***		
SQ3 <--- S_Q	.797	.060	16.473	***		
SQ4 <--- S_Q	.803	.055	17.578	***	0.905	0.577
SQ5 <--- S_Q	.731	.059	14.664	***		
SQ6 <--- S_Q	.714	.061	13.912	***		
SQ7 <--- S_Q	.658	.057	13.479	***		
PA1 <--- P_A	.833					
PA2 <--- P_A	.878	.049	22.091	***		
PA3 <--- P_A	.836	.053	20.340	***		
PA4 <--- P_A	.815	.050	19.529	***	0.940	0.724
PA5 <--- P_A	.865	.054	21.154	***		
PA6 <--- P_A	.878	.051	21.470	***		
MH1 <--- M_H	.734					
MH2 <--- M_H	.683	.069	13.162	***		
MH3 <--- M_H	.703	.082	13.359	***		
MH4 <--- M_H	.802	.069	15.086	***	0.862	0.510
MH5 <--- M_H	.638	.070	12.077	***		
MH6 <--- M_H	.716	.070	13.274	***		
TA1 <--- T_A	.956					
TA2 <--- T_A	.939	.024	34.518	***	0.835	0.582
TA3 <--- T_A	.410	.042	8.474	***		
TA4 <--- T_A	.604	.041	13.954	***		

From the above table, it is observed that all the indicators are statistically significant, which indicates that they are connected to their particular constructs. The AVE and CR values if greater than 0.5 and 0.7 respectively, then it is deemed that the measurement model possess the convergent validity. The results of the measurement model reveal that all the factor loadings, AVE and CR values are greater than the standard levels. Hence, it is concluded that the measurement model possesses convergent validity.

Table: 5 Discriminant Validity

	CR	AVE	MSV	T_A	M_F	S_Q	P_A	M_H
T_A	0.835	0.582	0.428	0.763				
M_F	0.956	0.757	0.611	0.654	0.870			
S_Q	0.905	0.577	0.119	0.262	0.345	0.760		
P_A	0.940	0.724	0.624	0.621	0.734	0.257	0.851	
M_H	0.862	0.510	0.504	0.559	0.782	0.341	0.790	0.714

Discriminant validity has been done by the comparison of AVE for each construct with squared inter construct correlations related to that construct. The above table presents the results of the discriminant validity, where all the AVE estimates are more than the squared inter construct correlations. It is clearly evident that average variance extracted (AVE) is greater than the maximum shared squared variance (MSV). So, study data passed through all the conditions like factor loadings, convergent validity and discriminant validity.

Equations 2 and 3 are estimated by OLS method. The estimated values are shown in table 6 and table 7 for two periods respectively. A step- wise regression analysis was also carried out and the estimated results are shown in the tables below.

XII (a). Before Pandemic:

Table: 6 Estimated Regression Coefficients of Equation – 1

BCS = f (BPA, BMH, BSQ, BMF, BTA)								
Equation	Constant (a0)	Regression Coefficients					R2	F
		BPA (a1)	BMH (a2)	BSQ (a3)	BMF (a4)	BTA (a5)		
I	0.571	0.267* (0.066)	0.209* (0.066)	0.148* (0.066)	0.182* (0.056)	0.136* (0.056)	0.772*	257.372
II	0.618	-	0.357* (0.056)	0.215* (0.065)	0.183* (0.057)	1.180* (0.056)	0.763*	305.433
III	0.612	0.384* (0.056)	-	0.197* (0.064)	0.214* (0.056)	0.144* (0.056)	0.767*	311.855
IV	0.586	0.305* (0.064)	0.244* (0.065)	-	0.227* (0.053)	0.163* (0.055)	0.769*	316.992
V	0.586	0.268* (0.067)	0.247* (0.066)	0.223* (0.062)	-	0.196* (0.053)	0.766*	311.352
VI	0.651	0.299* (0.065)	0.216* (0.066)	0.183* (0.064)	0.228* (0.053)	-	0.769*	316.103

*Significant at 5% probability level

*Figures in the parenthesis are standard errors

From the above table, considering equation I, when all factors are included in the model, it is noticed that the collective effect of all factors on customer satisfaction is observed to be 77.2% since the value of multiple correlation coefficient (R2) is 0.772. It is also noticed that this collective effect of independent factors on customer satisfaction before COVID – 19 effect is significant at 5% probability level. It is proved by F- test statistic. The coefficient of intercept term is 0.571. It is observed that the estimated regression coefficients of selected independent factors are positive and significant. A positive coefficient is established a positive relationship between the independent factor and customer satisfaction. Therefore, all independent factors, product availability, mall hygiene, service quality, facilities in the mall, technology established a positive relationship with consumer satisfaction in the shopping malls before pandemic period and it is also found that this positive effect is a significant effect. Hence, it is concluded that all the selected independent factors are positively and significantly influencing the customer satisfaction in the shopping malls. It is inferred that the customer is fully satisfied with the shopping mall activities before pandemic.

Step-wise regression equations were estimated by eliminating each variable in each equation by replacing the earlier variable. The factor product availability was eliminated and the regression was estimated with the remaining four factors. The estimated coefficients along with the relevant statistics are shown in equation II. The value of the intercept term is 0.618 while the coefficient of multiple correlation is 0.763. The variation in customer satisfaction by these four factors is observed to be 76.3% and it is a significant variation in satisfaction by these four variables. The elimination of the factor product availability decreases the customer satisfaction by 0.9%. It is observed to be a negligible variation on customer satisfaction. Finally, it is concluded that the elimination of product availability is not influencing much on satisfaction. The customers were satisfied with the available alternate products and also the other factors influencing the customer satisfaction are making the customer satisfied. In the above table, the coefficients of selected four factors were mall hygiene, service quality, facilities and technology are found to be positive and significant. A positive and significant coefficient reveals the positive and significant relationship with customer satisfaction before pandemic period. Hence, it is observed that all four factors are significantly influencing the customer satisfaction in the shopping malls.

In equation III, Hygiene factor was eliminated. The regression was estimated with the remaining four factors and the coefficients with appropriate statistic are presented in the table-1 above. The estimated coefficients of the remaining four factors after eliminating the hygiene factor established a positive relationship, independently, with customer satisfaction before pandemic period in shopping malls. These positive relationships of the four factors are significant relationships with satisfaction proved by t – test statistic. A unit increase in each of these factors, product availability, service quality, mall facilities and technology will increase the customer satisfaction by 0.384 units, 0.197 units, 0.214 units and 0.144 units respectively. These increases by the factors on satisfaction are significant increases. The value of the intercept term is 0.612. The aggregate effect of these four factors is indicated by the value of multiple correlation coefficient (R2). Collectively, these four variables in the model shows 76.7% of variation on customer satisfaction in the shopping malls before pandemic period. This combined variation is found to be significant variation on customer satisfaction, proved by F – test statistic. Comparing the collective effects in equation I and equation III, only 0.5% variation was decreased on customer satisfaction. Hence, the elimination of the factor mall hygiene is not showing much variation on customer satisfaction before pandemic. The above result shows that customers were not much focused on mall hygiene before pandemic. The priorities of the customers in the shopping malls were different which are making the hygiene factor less significant.

In the next stage, the **factor service quality was eliminated** and the regression was estimated with the remaining four variables after replacing the factor shopping mall hygiene. The aggregate effect of these four factors are expressed by the multiple relationship. The value of multiple relation is determined as 0.769. These four factors aggregately show 76.9% of variation on customer satisfaction before pandemic. This variation is found to be a significant variation on customer satisfaction. This significance of variation was proved by F – test statistic through ANOVA. Comparing this variation with the aggregate variation in equation I, it is found only 0.3% difference was noticed. This difference in variation was noticed by eliminating the factor service quality. Therefore, the elimination of service quality from the model, the variation on customer satisfaction is negligible. The recorded intercept value is 0.586. The estimated coefficients of four factors are positively and significantly influencing the customer satisfaction before pandemic period. The coefficients established a positive and significant relation with satisfaction since all four estimated coefficients possessing positive sign. The values of estimated coefficients are 0.305, 0.244,

0.227 and 0.163. One can say that a unit increase in each of these four factors will increase the customer satisfaction by 0.305 units, 0.244 units, 0.227 units and 0.163 units respectively. These units of increases by four factors established a significant increase on customer satisfaction. Finally, it is inferred that the variation in customer satisfaction after eliminating the service quality is negligible. The results in equation IV clearly shows that mall facilities and technology dominating the customer satisfaction though the service quality is not in optimum level.

In the next step of step – wise regression equation, the **factor mall facilities is eliminated**, the factor service quality is replaced and the regression was estimated with four factors. The estimated regression coefficients of the four factors with the corresponding standard errors, multiple relation and intercept values are presented in the table - 6 (equation V in the table – 6). Observing the estimates of the coefficients of the factors, it is found that all are positive and significant at five percent probability level. Therefore, a positive and significant relationship between consumer satisfaction and each of the selected independent factors i.e., an increase in each of these factors will increase the customer satisfaction at significant level. The values of the factors estimated coefficients are 0.268, 0.247, 0.223 and 0.196. From these values it is evident that a unit increase in each of these factors will increase the customer satisfaction by 0.268 units, 0.247 units, 0.223 units and 0.196 units of product availability, mall hygiene, service quality and technology respectively. The significance of these coefficient's is tested by t – test. The intercept value is recorded as 0.586. The multiple correlation coefficient was estimated and it is observed to be 0.766. From this value we can say that the collective effect of these variables on satisfaction is 76.7%. By F – test statistic, it is proved that the aggregate effect (76.7%) of these factors on customer satisfaction is significant. It is compared with the variation in equation I, only 0.6% variation was decreased by eliminating the factor shopping mall facilities. This variation (0.6%) is not a countable variation on customer satisfaction. Therefore, the customers are adjusted with the existing facilities in the shopping mall before pandemic period provided the other factors product availability, hygiene, service quality and technology in the malls are significantly satisfying the customers. In case of less facilities present in the shopping mall, product availability, hygiene and service quality factors play a key role in satisfying the customers before pandemic.

In continuation of step-wise regression analysis, the factor technology is eliminated from the model and replaced the mall facilities in equation. The regression was estimated with four factors. The aggregate effect of these four factors on customer satisfaction before pandemic is expressed by the coefficient of multiple relation. The value of (R2) is 0.769. The aggregate effect of four selected factors on customer satisfaction is observed to be 76.9%. Therefore, 76.9% of variation is recorded on satisfaction by these four factors. This total variation is found to be a significant variation. It is proved by F – test statistic. The elimination of technology factor reveals the decrease in total variation is 0.3% when comparing with the variation in the model with five factors. Hence, it is noticed that the elimination of technology adopted in the shopping malls show a negligible customer satisfaction. Finally, it is concluded that the mall management did not focused much on technology adaption in the shopping mall. Almost a similar trend is observed in case of service quality though the service quality affects the customer satisfaction significantly. The value of the intercept term is 0.651. Comparing the intercept values in the above equation, it is found to be high. Observing the estimated coefficients of four factors after eliminating the technology, all factors are established positive and significant relation with the customer satisfaction in the shopping malls before pandemic. The significant effect of these factors was tested by t – test statistic. A unit increase in each of these four factors, product availability, mall hygiene, service quality and facilities will increase the satisfaction by 0.299 units, 0.216 units, 0.183 units and 0.228 units respectively. These increases by factors on satisfaction are significant increases.

From the above analysis it is observed that almost all selected factors are influencing the customer satisfaction before pandemic. The customers are satisfied with the selected factors. Elimination of each factor may not affect much on aggregate effect on customer satisfaction. These factors collectively established around 77% of variation on customer satisfaction before pandemic period. These aggregate variations are also significant variations on customer satisfaction.

During Pandemic:

A similar estimation pattern of regression equation and step-wise regression equations are used during pandemic period to establish the relationship between customer satisfaction in the shopping malls and other selected five independent factors. Initially, we estimated equation 3 with five independent factors as considered in before pandemic. Later each factor was eliminated from the model and replaced in subsequent model. The values of the estimated coefficients along with the corresponding standard errors, multiple relation, F – values and intercept values are presented systematically in Table – 7 below:

Table: 7 Estimated Regression Coefficients of Equation – 2

DCS = f (DPA, DMH, DSQ, DMF, DTA)								
Equation	Constant (a0)	Regression Coefficients					R^2	F
		DPA (a1)	DMH (a2)	DSQ (a3)	DMF (a4)	DTA (a5)		
I	0.525	0.131* (0.059)	0.240* (0.057)	-0.097 (0.062)	0.158* (0.069)	0.387* (0.071)	0.680*	160.978
II	0.552	-	0.309* (0.047)	-0.064 (0.060)	0.158* (0.069)	0.408* (0.070)	0.676*	197.984
III	0.604	0.271* (0.051)	-	-0.058 (0.062)	0.173* (0.070)	0.393* (0.072)	0.665*	188.388
IV	0.537	0.109 (0.058)	0.227* (0.056)	-	0.124 (0.065)	0.358* (0.068)	0.678*	199.848
V	0.582	0.131* (0.060)	0.246* (0.057)	-0.051 (0.059)	-	0.490* (0.055)	0.675*	197.628
VI	0.646	0.175* (0.061)	0.246* (0.059)	-0.009 (0.062)	0.396* (0.055)	-	0.655*	180.041

*Significant at 5% probability level

*Figures in the parenthesis are standard errors

From the estimated regression coefficients of equation 3, in the above table – 7 (equation I), it is observed that an insignificant negative relation was noticed by the factor service quality with customer satisfaction during pandemic period. Since the estimated coefficient value of service quality is -0.097, therefore, the customer is not satisfied with the service quality in the shopping malls during pandemic. The coefficients of product availability, hygiene, facilities and technology are observed to be positive and significant at five percent probability level. The values of the coefficients of the factors are 0.131, 0.240, 0.158 and 0.387. A significant increase in customer satisfaction is observed by an increase in each of these four factors. A unit increase in each of the factors will increase the satisfaction by 0.131 units, 0.24 units, 0.158 units and 0.387 units respectively. The value of intercept term is 0.525. The value of (R2) is 0.68. Therefore, the aggregate effect of five variables on customer satisfaction is 68%. This aggregate variation in satisfaction is a significant variation, tested by F – test statistic.

In step-wise regression estimation, initially we eliminated the factor product availability and the equation was estimated with remaining four factors. The estimated values are shown in the table- 7 (equation II). The intercept value is found to be 0.552. The value of multiple relation is noticed as 0.676. It expresses the total effect of four factors on customer satisfaction. The collective effect of factors on customer satisfaction during pandemic is recorded as 67.6%. This variation in satisfaction is a significant variation observed by 'F' value. The exclusion of product availability factor from the model did not show much decrease (-0.4%) in customer satisfaction. The customer satisfaction is not much affected though the exclusion of product availability from the model. Hence, it is inferred that the customer is satisfied with the remaining factors and the alternate product though the desired product is not available. The coefficient of service quality is negative. A negative relation was established between service quality and customer satisfaction. This negative relation was only 6.4%. This negative relation is not a significant relation. The coefficients hygiene, facilities and technology are positive and significant (0.309, 0.158 and 0.408 respectively). These positive coefficients reveal the positive relationship with customer satisfaction in the shopping mall during pandemic period. A unit increase in each of these three variable will increase the customer satisfaction by 0.309 units, 0.158 units and 0.408 units respectively. Therefore, the customer is positively and significantly influenced by these three variables.

Later, the factor mall hygiene was eliminated and the factor product availability is incorporated in the model. The equation was estimated with four factors and the corresponding statistical values are exhibited in above table- 7 (equation III). The aggregate effect of these four factors is found to be 66.5%. Therefore,

the variation in customer satisfaction, collectively by these factors is 66.5% and this variation is found to be significant variation. It is proved by F – test statistic. The elimination of factor mall hygiene will decrease the total variation in satisfaction by 1.5% while comparing with the initial equation (68% variation). The customer satisfaction during pandemic is not much affected by the elimination of mall hygiene factor. Therefore, the customer is satisfied with the remaining four factors though the mall hygiene is not improved during pandemic. The intercept value is found to be 0.604. The coefficient of service quality is observed to be negative (-0.058) and insignificant. An insignificant negative relation was noticed by these service qualities with satisfaction. The estimated values of product availability, mall facilities and technology adaption are positive. A positive coefficient establishes a positive relation with customer satisfaction during pandemic. A unit increase in each of these three variables will increase the customer satisfaction by 0.271 units, 0.173 units and 0.393units respectively. This increase on satisfaction is a significant increase by these three factors. The customer satisfaction during pandemic is significantly affected by the factors, product availability, mall facilities and technology though the effect of service quality is negative and hygiene was eliminated. Finally, it is concluded that the customer did not considered low level of mall hygiene and service quality over satisfaction level during pandemic period.

The factor service quality was eliminated from the model and mall hygiene variable is added to the model. The regression equation with four factors product availability, mall hygiene, facilities and technology were estimated and the coefficients along with corresponding standard errors and multiple determination was presented in table - 7 (equation IV). The estimated regression coefficients establish a positive relationship with customer satisfaction but it is significant in case of two factors technology and mall hygiene. These two factors expressed 58.5% of variation on customer satisfaction. The remaining two factors product availability and facilities are not shown significant effect on customer satisfaction. The value of intercept term is 0.537. The value of (R2) is determined as 0.678. Therefore 67.8% of variation on customer satisfaction was recorded by these four factors aggregately. This aggregate variation is found to be a significant variation on customer satisfaction. Observing the variations of equation, I and equation IV, it is noticed that the elimination of service quality factor will decrease the total variation by 0.2% only. It is negligible variation on customer satisfaction. The effect of service quality on customer satisfaction is almost nil. It is concluded that the wo factors mall hygiene and technology are the major determinants of customer satisfaction in the shopping mall during pandemic period. The exclusion of service quality is not influencing the customer satisfaction.

In equation V of step-wise regression, the factor 'mall facilities' is eliminated and the factor service quality is added to the model. The multiple linear regression equation was estimated with four factors other than mall facilities. The estimated regression coefficients and multiple determination are given in the table – 7. From the estimates of equation V, the product availability, hygiene and technology established a positive relationship with customer satisfaction in the shopping mall during pandemic period. Hence, these three factors are the major determinants of customer satisfaction. The coefficients of these three factors are 0.131, 0.246 and 0.490. A unit increase in each of these factors will increase the satisfaction by 0.131 units, 0.246 units and 0.49 units respectively. These increases are significant increases in customer satisfaction. It is inferred that the major determinants of customer satisfaction are product availability, hygiene and technology during pandemic period. The value of intercept term is 0.582. The negative coefficient of service quality factor expresses a negative relationship between satisfaction and service quality but this negative relation is not a significant relation. The combined effect of these four factors on customer satisfaction is noticed by multiple determination (Value of R2) which is 0.675. Therefore 67.5% of variation on customer satisfaction was recorded by these four factors. This variation is observed to be a significant variation, proved by F – test. Comparing the variations in equations I and equation V, only 0.5% variation was decreased on customer satisfaction by elimination of mall facilities. This variation is a negligible variation. Finally, the exclusion of mall facilities may not affect the customer satisfaction during pandemic. It is concluded that the customer is satisfied with the factor's product availability, mall hygiene and technology significantly during the pandemic period.

In the last step of step-wise regression equation, we excluded the factor technology adoption and replaced with the factor mall facilities. The equation was estimated by OLS method and the results are shown in table – 7 (equation VI). The value of intercept term is 0.646. The aggregate effect of four independent factors on customer satisfaction during pandemic is determined as 65.5% since the multiple determination is 0.655. From F – test statistic, this multiple relation is identified as a significant relation. A negative relationship was noticed by the factor service quality with customer satisfaction during pandemic period. It reveals the service quality in the mall is not optimum. The other three factors product availability,

mall hygiene and mall facilities are established a positive and significant relationship with customer satisfaction in the mall. The estimated parameters of three factors are 0.175, 0.246 and 0.396. It is identified that these factors are the major determinants of customer satisfaction when technology was eliminated. For every unit increase in each of these factors will increase the satisfaction by 0.175 units, 0.246 units and 0.396 units respectively.

From the above analysis related to customer satisfaction in the shopping malls during pandemic, only the factor service quality is not influencing the customer satisfaction positively but almost all the selected factors in the mall enhanced the customer satisfaction in the mall during pandemic. Particularly, the technology adoption, mall facilities and mall hygiene impressed the customers and leading to repetitive visits.

Mean Differences of Shopping Mall Activities:

The other phase of our objective is to determine the significance of differences in mean of the shopping mall activities between the two periods before and during pandemic. To examine the significance of the differences, the researcher calculated means of each mall activities in two periods, differences between the means of the activities, corresponding standard deviations along with z- test statistic. These values are presented in the table – 8 systematically.

From the results shown in table – 8 it is observed that the mean differences in all mall activities except service quality are significant at five percent probability

Table: 8 Testing of Mean Differences in Shopping Mall Activities

Shopping Mall Activities (1)	Means		Mean of Differences (4)	Standard Deviation (5)	Z – value (6)
	Before (2)	During (3)			
Technology Adopted	5.6688	5.9532	0.2844	1.0226	3.4146*
Mall Facilities	5.6255	6.0385	0.4129	1.0759	4.8117*
Service quality	5.7591	5.5944	0.1647	1.0687	1.9302
Mall Hygiene	5.9385	4.6779	1.2606	1.0946	15.8248*
Product availability	5.8834	5.0230	0.8604	1.0827	10.5668*
Customer satisfaction	6.0280	5.0233	1.0046	1.2120	12.6302*

*Significant at 5% probability level

level. Therefore, it is clearly visible that some drastic changes were taken place in shopping mall activities due to COVID – 19 effect between the two time periods before and during pandemic. Hence, it is concluded that a significant COVID – 19 effect was observed in shopping malls in Bangalore city.

Conclusion

The customer satisfaction before pandemic is depending on five major factors. They are product availability, hygiene, service quality, facilities and technology. When we established the relation between customer satisfaction and the selected shopping mall activities, it is observed that all activities positively and significantly influenced the customer satisfaction. Therefore, customer satisfaction is depending on these factors significantly. More than seventy seven percent of variation in customer satisfaction is recorded by these factors. It is a significant variation. In step-wise regression analysis, it is noticed that the exclusion of each mall activity affects the customer satisfaction negligibly. In step-wise regression analysis it is noticed that a small decrease in total variation was recorded by eliminating each mall activity each time. Finally, it is inferred that before pandemic period the selected five shopping mall activities satisfying the customer in the shopping mall was significant. These activities influence the satisfaction by around 76%. During pandemic period also similar type of relationship was established between satisfaction and selected mall activities. It is observed that the selected factors affect the customer satisfaction collectively by 68%. Comparing this variation with before pandemic period the customer satisfaction was decreased during pandemic since the service

quality activity established negative impact on customer satisfaction. It reveals that the service quality is not up to the expectation of customer satisfaction. In step-wise regression analysis also the similar trend was recorded with service quality activity. The product availability and facilities activities show a little adverse effect on customer satisfaction when service quality was excluded. In case of testing the differences in mean shopping mall activities, the study expressed that there is a significant difference in mean mall activities between the two periods. It is also noticed that the mean difference in case of service quality is not significant though there is a little difference.

Scope for Further Research:

Similar study can be done to compare the consumer satisfaction before and during pandemic in shopping malls in other major cities like Mumbai, Delhi, Chennai, Hyderabad etc., where COVID – 19 outbreaks had showed the severe effect. Some other factors which are not included in the present study may influence customer satisfaction. The researchers may identify those factors which enhance the customer satisfaction in the shopping malls. Similar study with other factors of customer satisfaction can be measured in Discount stores, hyper marts etc.

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