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## Research Article: 5

Do Demographic Factors influence the Buyer's Attitude towards Online Purchase of Pharmaceutical Products? - A Study with Special Reference to Kolkata



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## Abstract

Digitalization is occurring in every place of the world throughout every sector. Likewise, the pharma industry is a part of this evolution. Though for India, e-pharmacy is a newly introduced medium of trading, despite that, this sector has grown significantly within less than a decade. Along with the market change, there is a change in the behavior of the customers as well. From the different studies on e-commerce, significant socioeconomic factors like gender, age and income have come up as significant factors determining the attitude towards online shopping.

*Considering these factors, in this study we* will determine the relationship among those factors, by including two more factors - education and occupation, which will help to build a better business decisions strategy for the of pharmaceutical companies based on Kolkata rank correlation and region. Spearman "Multinomial Logistic Regression" was used to understand the relationship among the select factors which determine the nature of online shopping for pharmaceutical products.

**Keywords**: *E-Pharmacy, Online Shopping, Socio-Economic Factors, E-commerce, Consumer Behaviour.* 

#### **1. INTRODUCTION**

In the aspect of delivering medical demand pharmaceutical industry is blooming in support which brings investors the light of attention for ages. Health is one of the fundamental needs in human life which comprise of medicine, doctor medical staff, and other equipment. This industry is changing rapidly with the changes in innovation, technology, and globalization and became one of the potential sectors. It has been expected this industry will reach \$130 billion by 2030 in India. In 2022 pharma industry contributed 1.72% of the GDP (Sarwal et al., 2021). This whole market was only operating in physical mode by the chain of shops or standalone shops till 2015. With the evolution of technology like any other sector, this sector also comes up with digital implementation in the business. Considering the factors and the change in the market scenario, big giant companies like Medlife, 1MG, PharmEasy, Netmeds, etc. have come up with a hybrid mode of business, i.e., online and offline mode of business.

There has been a continuous evolution in adoption of online marketing. Therefore, various sectors including the pharmaceuticals sector also coming down in the umbrella of online business. Various studies have conducted such as *Zhang (2009), "Bhatnagar et al., (2000), Donthu and Garcia (1999), Korgaonkar et al., (1999), Jain and Kaul, (2017)* etc. have shown the adoption of online shopping based on various factors such as gender, age, income, culture etc". Therefore, current study aims to understand the changing patterns of such adoption factor in pharmaceutical sector. The present study is divided further into following sections -Introduction, Literature Review, Research Methodology, Data Analysis and Findings and Conclusion.

#### **2. LITERATURE REVIEW**

Alba et al. (1997) stated in his research done two decades ago shows female consumers are about to take away the online shopping market in comparison to the opposite gender in the coming years and they will be prime consumers of the product and the main target audience. Korgaonkar et al. (1999) said a study shows how incomes leave positive impacts on apparel online shopping. Studies show that higher income leads to more web usage. Alreck and Settle (2001), Hasan (2010) depicts in a study the same fact that females acquire more satisfaction from e-shopping which leads to a positive impact on e-shopping in comparison to men consumers. "Armstrong and Kotler (2003), Adcock et al. (1995), Hawkins et al. (1995), Wu (2003) also confirm that consumer behavior is categorized on the basis of age, profession, and socioeconomic factors". "Bagchi and Mahmood (2004), Donthu and Garcia (1999), Bellman et al. (1999), Li et al. (1999), Susskind (2004, Liao and Cheung (2001) found education and online literacy go hand in hand". It has found a linear relationship between these two factors. As

reason of cause, it could be said a certain level of literacy is needed to understand the functionality of digital media. In comparison to street shopping, online shopping requires a complex level of understanding to purchase the right product. Bartol (1979), Kerr et al. (1977) Lachman and Aranya (1986) stated occupation of individual leaves impacts an individual lifestyle and mindset. People in similar occupations tend to have similar behavioral patterns since it builds up similar values and expectation. Though it was found in most of the research on online shopping that occupation has no direct involvement in the decision-making of buyers at the macro level. *Bhat and Darzi (2019)* observed the impact of age and gender on online shopping. This study mainly focused on age group of 21-30 and below 20. It has also found the benefit of online shopping on customers perspective. It said the previous knowledge of IT services influence the consumers of these age group to opt e-shopping. *Bhat and Darzi (2019)* in their study have found significant involvement of age as a determinant factor. It has been observed that young people are more convenient with IT skills or computer knowledge from a very young age from different sources they are being trained with computer interface. Compare to that fact, Baby Boomers or Gen X have less engagement with smart devices. Bhatnagar and Ghose (2004) depicts e-shoppers behavior and their perception on e-shopping. To find out behavioral nature website design,

security, web services has considered. A vivid study has been conducted on the services available for web shopping and consumers perception on that. "Bhatnagar et al. (2000), Doolin et al. (2005), Liebermann and Stashevsky (2009) have also found there is a negative or no relationship between age and online shopping". "Fram and Grady (1997), Mehta and Sivadas(1995), Sultan and Henrichs(2000), Zhou et al. (2007) depicts there are many studies regarding factors determining the motivation of online shopping among individuals. Various demographic factors such as age, gender, educational qualification, city, and family income significantly impact online shopping". *Zhang (2009)* has also found age as a significant factor in online shopping. Hernández et al. (2011) show that once, individuals experience online shopping, they are more likely to stick to it. Jain and Kaul (2017) found a stable and good income brings stability to individual life and tends to have positive attitudes toward eproducts.

#### **3. OBJECTIVES OF THE STUDY**

The objectives of the study are as follows:

- To analyse the demographic factors affecting the online shopping of pharmaceutical products;
- To understand the probability of each such relating factors using multinomial logistic regression, which influences online shopping of pharmaceutical products.

#### 4. RESEARCH METHODOLOGY

The present study collects the data from various areas of Kolkata regarding gender, age and frequency of online shopping of medicines. The data was collected from nearby localities, and distribution of questionnaires via e-mail. The questions were selected based on the literature and a convenience sampling of 100 participants were selected for the study. The male, female and total population of Kolkata as per census report of 2011 were 23,56,766; 21,39,928 44,96,694 respectively and (Handbook of State Statistics, 2014). The sample size was found to be about 0.002% of the population size.

The attitude toward the frequency of online shopping was measured by using a "5-point Likert scale as - 1 (Never), 2 (Rarely), 3 (Sometimes), 4 (Very Often), and 5 (Always)". (Kothari, 2020). Chart 6 shows the respondent's attitudes toward online shopping for pharmaceutical products. It shows that about 31% of the respondents had a positive attitude towards online shopping for pharmaceutical products online and the rest of the respondents were having more or less equal frequency of shopping for pharmaceutical products online.

Spearman Rank Correlation was applied in order to understand the relationship between the demographic variables and the frequency of online shopping for pharmaceutical products. **Equation (1)** shows the formula to compute the rank correlation.

$$\rho = 1 - \frac{6 \sum d_i^2}{n(n^2 - 1)}$$
 (1)

In Equation (1),  $\rho$  is the Spearman rank correlation coefficient, d is the difference in ranks, and n is the number of observations. If the factors were found correlated significantly, a multinomial logistic regression was carried out.

#### Multinomial Logistic Regression

"To figure out the probabilities for the m categories of a qualitative dependent variables Y, a generalized Multinomial logistics regression is used". It uses a set of independent variables, which may be one or more than one set of independent variables. The equation (2) shows the model for multinomial logistic regression model.

$$PrY_{ik} = PrY_i = k | x_i; \beta_1, \beta_2, ..., \beta_m$$
  
= 
$$\frac{exp\beta_{0k} + x_i\beta'_k}{\sum_{j=1}^m exp\beta_{0j} + x_i\beta'_j}; k = 1 \text{ to } m$$
 (2)

In the given equation,  $\beta_k$  represents the set of regression coefficients for the  $k^{th}$  category of *Y*, expressed as a row vector (*Zhao and Cen*, 2013).

#### • The Model

"Based on the objectives of the study, which is to examine the relationship between the frequency of demographic factors and the decision to purchase medicine online is established using the following model"

$$Y = \alpha + \beta X \tag{3}$$

In **Model (3)**, the dependent variable Y is the frequency of online shopping of the

pharmaceutical products and the X is the significant demographic factor which is found to be significantly correlated with the factors affecting online shopping of pharmaceutical products.

#### **5. RESEARCH HYPOTHESES**

Based on literature review and research methodology, the hypotheses of the present study are as follows:

H<sub>1</sub>: Gender factor is correlated with online shopping of pharmaceutical products.

H<sub>2</sub>: Age factor is correlated with online shopping of pharmaceutical products.

H<sub>3</sub>: Education factor is correlated with online shopping of pharmaceutical products.

H<sub>4</sub>: Occupation factor is correlated with online shopping of pharmaceutical products.

H<sub>5</sub>: Income factor is correlated with online shopping of pharmaceutical products.

#### 6. DATA ANALYSIS AND FINDINGS

• *Descriptive Statistics:* The Demographic profile is represented using pie charts 1 to 5 and the frequency of the online purchase of Pharmaceutical products is shown using pie chart 6.



Source: Researcher's Computation from Primary Data

**Chart 1** shows the gender demographics. Out of 100 respondents, 34% were female and 66% were male. **Chart 2** follows the methodology of *Pew Research Center (2015)* to classify the generation by age of the individuals. In our sample, about 49% of the total respondents were belonging to Gen Z, 45% belonged to Gen X, and the rest 6% were belonging to Baby Boomers and Gen Y each. Regarding educational demographics, the maximum of the respondents was Graduate and Post Graduate (40% and 56% respectively).

3% of the respondents were Higher Secondary qualified and only 1% of the respondents were doctorate qualified. The main reason for such classification was to understand the behavior due to various educational levels on the online shopping of pharmaceutical products. **Chart 5 and 6** shows occupation and income demographics respectively. These show that a maximum of the respondents were salaried employees and the maximum portion of the sample had a family income of more than Rs. 80,000 per month.

#### • Spearman Rank Correlation

**Table 1** shows the Spearman's Rank correlation coefficient between the frequency of online shopping and various demographic factors such as gender, age, educational qualification, occupation and family income. The significant positive correlation was found between frequency of online medicine shopping (freq) and family income of the respondent (inc) *(indicated by bold and italics figure)*.

Rho	Gender	Age	Freq	Edu	Осс	Inc
Gender	1.000	-0.284	0.075	-0.240	-0.268	0.042
Age	-0.284	1.000	-0.155	-0.039	0.323	-0.320
Freq	0.075	-0.155	1.000	0.053	-0.042	0.207
Edu	-0.240	-0.039	0.053	1.000	0.140	0.104
Occ	-0.268	0.323	-0.042	0.140	1.000	0.034
Inc	0.042	-0.320	0.207	0.104	0.034	1.000

 Table 1. Spearman's Rank Correlation

Source: Researcher's Computation

#### • Multinomial Logistic Regression

The **Likelihood Ratio Test (Table 3)** shows that the model with the family income parameter is better than the intercept only model (p-value=0.058). It indicates that the family income is the most significant factor than the age, gender, education and occupation among the people of Kolkata, West Bengal. The online shopping of pharmaceutical products is significantly related with the

frequency of online shopping of pharmaceutical products as shows in **Table 1**. Therefore, hypothesis 5 was accepted and the rest were rejected.

In order to understand the likelihood of purchase of pharmaceutical products based upon the family income, a multinomial logistic regression was applied on the dataset of family income and frequency of purchasing of pharmaceutical products online. Table 2 shows the coefficients and the odds ratio of the income coefficient based upon the reference category 'Never'. The coefficients indicate that how likely the individual is to adopt the online shopping. The p-values of the category 'very often' are significant at 5 and 10% levels respectively. The negative coefficients indicate that the likelihood of online shopping is very low. The increasing odds ratio indicates that as the income level rises, the likelihood of the online purchase of pharmaceutical products increases. The Nagelkerke R<sup>2</sup> was found to be 23.7%, which indicates that about 23.7% variance could be explained by the model.

r requency of Online Snopping of						P-	Uaas	202	10 UI
Medicine <sup>a</sup>		В	Std. Error	Wald	d.f.	value	Ratio	LB	UB
Rarely	Intercept	0.693	0.707	0.961	1	0.327	-		-
	Option: <20,000	-0.288	1.155	0.062	1	0.803	0.750	0.078	7.210
	Option: 20,000-40,000	-0.693	0.886	0.611	1	0.434	0.500	0.088	2.841
	Option: 40,000-60,000	-0.981	1.041	0.888	1	0.346	0.375	0.049	2.884
	Option: 60,000-80,000	-19.902	0.000	-	1	-	0.000	0.000	0.000
	Option: >80,000	0p	-	-	0	-	-	-	-
Sometimes	Intercept	0.000	0.816	0.000	1	1.000	-	-	-
	Option: <20,000	0.405	1.225	0.110	1	0.741	1.500	0.136	16.542
	Option: 20,000-40,000	-0.560	1.029	0.296	1	0.587	0.571	0.076	4.297
	Option: 40,000-60,000	0.223	1.057	0.045	1	0.833	1.250	0.158	9.917
	Option: 60,000-80,000	0.693	1.472	0.222	1	0.638	2.000	0.112	35.807
	Option: >80,000	0p	-	-	0	-	-	-	-
Very Often	Intercept	1.897	0.619	9.389	1	0.002 <sup>c</sup>	-	-	-
	Option: <20,000	-2.590	1.372	3.563	1	0.059 <sup>c</sup>	0.075	0.005	1.105
	Option: 20,000-40,000	-2.457	0.881	7.776	1	0.005 <sup>c</sup>	0.086	0.015	0.482
	Option: 40,000-60,000	-1.674	0.913	3.363	1	0.067 <sup>c</sup>	0.187	0.031	1.122
	Option: 60,000-80,000	-1.897	1.544	1.510	1	0.219	0.150	0.007	3.092
	Option: >80,000	0p	-	-	0	-	-	-	-
Always	Intercept	0.511	0.730	0.489	1	0.484	-	-	-
	Option: <20,000	0.182	1.133	0.026	1	0.872	1.200	0.130	11.052
	Option: 20,000-40,000	-1.358	1.005	1.827	1	0.176	0.257	0.036	1.843
	Option: 40,000-60,000	-1.204	1.133	1.130	1	0.288	0.300	0.033	2.763
	Option: 60,000-80,000	0.182	1.426	0.016	1	0.898	1.200	0.073	19.631
	Option: >80,000	0 <sup>p</sup>	-	-	0	-	-	-	-
a. The reference category is: Never.									
b. This parameter is set to zero because it is redundant.									
c. The coefficient is significant at 5% and 10% level respectively.									

able 2. Relationship of Income an	d Online Shopping of Pha	rmaceutical Products
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**Source:** *Researcher's Computation* 

	Model Fitting Criteria			Likelihood Ratio Tests			
			-2 Log				
	AIC of	BIC of	Likelihood				
	Reduced	Reduced	of Reduced				
Effect	Model	Model	Model	Chi-Square	d.f.	Sig.	
Intercept	90.644	142.748	50.644 <sup>a</sup>	0.000	0		
Family Income	84.372	94.793	76.372	25.727	16	0.058	

#### **Table 3: Likelihood Ratio Tests**

#### CONCLUSION

Demographic factors always have a strong impact on the buying behaviors of the customers. Strategies are built, measurements are being taken on the basis of these. Finding out Relationship among these factors to conclude/ analyze a buying decision/ preference of consumer is critical. For different product buying nature of a customers also varies specially for online shopping. Along with convenience of 24×7 availability, it comes with demerits like no physical experience of products, no buying assistance, minimum IT proficiency, availability of online services etc. So, for a country like India with so much variant, conclude a general approach for a whole region in this respect might be inappropriate.

This study is based on a particular demographic area where basic facilities of e-services are easily available. Now, to find out the probable choice of consumers and discover the root of the behaviors, most prominent demographic factors liable of consumer behavior for e-shopping is analyzed. Though demographic factors are essential, but these cannot be the only factors to influence the decision of the consumers. Hence, this is where this study lacks to give the final verdict on the buying strategies and approached to be introspected in detailed to incorporate other factors if any.

Source: Researcher's Computation

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