

Factors Influencing Patients to Choose Private and Public Hospitals: A Statistical Analysis

A.K.M. Zahirul Haq¹

Abstract

When patients decide to go to hospital for treatment, they have the options to go either public hospital or private hospital. Patient's decision of choice of hospitals depends on some factors, which are the consideration of this study. The main objective of the study is to find out the factors influencing patient to choose private and public hospitals. This cross-sectional study considers 140 (70 from public hospitals and 70 from private hospitals) postoperative patients of gall stone surgery selected randomly in Dhaka city. The logistic regression model has been applied to find out the factors affecting the choice of place of operation. Mean test is performed to determine any significant difference between the variables. To observe the features, cross tabulation technique is used and also the statistical significance of the results is tested through chi-square test. Some important findings were found from the study results. Consideration of low cost of treatment (72.9%) and the advice of doctors (37.1%) were the main reasons for selecting public hospitals. On the other hand getting quality care and less time to take treatment were the main reasons behind selecting private hospitals. Logistic regression model shows that family income, education, days of sufferings before admission and advice of doctors have significantly influenced to choose the place of operation.

Keywords: Logistic regression model, Chi-square test, Mean test, Public hospital and Private hospital

Introduction

For health and diseases or injury need immediate medical care. Hospital is a place of providing medical care. A hospital is a human services organization, the objective of which is to help people retain and maintain health. It provides care and services such that people can regain health and remain healthy improving the quality of life [1]. Two types of hospitals remain in our country namely public hospital and private hospital. Patients have the options to get health services from public hospitals or private hospitals. The decision on the choice of place was based on a number of factors. In this study, we tried to uncover the factors pressuring patients to choose private and public hospitals. For this reason we consider Cholelithiasis (Gall Stone), which is one of the common surgical problems. It has been reported that about 10-20% of adult population have cholelithiasis in developed countries [2]. Considering availability of patients, the researcher choose the ailment of gall stone surgery from both public and private hospitals at Dhaka city in Bangladesh. The overall objective of the study is to find out the factors influencing patients to choose private and public hospitals.

¹ Assistant Professor, Department of Statistics, National University, Gazipur, Bangladesh

Materials and Methods

This was a cross-sectional study and retrospective in nature. The study design was chosen to compare at a given time a cross-section of patients of all ages and both sexes who underwent surgical intervention due to gall stone ailments, at different public and private hospitals in Dhaka city during the period January 01, 2008 to April 30, 2008. Data were collected by the author using one questionnaire for each patient. The study area includes the Public hospitals (like Dhaka Medical College Hospital, Solimullah Medical College Hospital and Showrowarthy Hospital) and different private hospitals (namely Central Hospital, Islami Bank Hospital, Asian Hospital, R.M.C. Hospital, Fortune General Hospital, Abeda Memorial Hospital, Well care Hospital, Badda General Hospital, Aichi Hospital, The Barakah General Hospital, Al-Rashid General Hospital Pvt. Lt., Salauddin General Hospital, Latika General Hospital, Proshanti Hospital Ltd.) at Dhaka city in Bangladesh.

Sample size

A total of 140 postoperative patients of gall stone ailments were considered as sample size out of which 70 patients considered from public hospitals and 70 patients considered from private hospitals. Sample size was estimated by the following formula.

$$n = z^2 pq / d^2$$

Where z at 95% significance level is 1.96, p = Probability of cholelithiasis = 10% since, it has been reported that about 10-20% of adult population have cholelithiasis in developed countries, [2]. q = 1-p i.e. 90% and d = desired degree of accuracy, here 5%. Then the sample size would be:

$$n = z^2 pq / d^2$$

$$n = (1.96)^2 (.1)(.9) / (.05)^2$$

$$n = 138.2976 \approx 140$$

Logistic regression model

The choice of the patients with the two types of hospitals can be measured by Logistic regression model. Since in our study choice of place is a dichotomous variable, we use logistic regression model. Let choice of public hospitals is denoted by 0 and that of private hospitals is denoted by 1. According to logistic model:

$$p_1 = E(Y = 1 / X) = \frac{1}{1 + e^{-(\beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3)}}$$

$$P_1 = \frac{1}{1 + e^{-Z}} \quad \text{where, } Z = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3$$

Here X_1 = family income, X_2 = education X_3 = days of sufferings.

If p_1 is the probability of going to private hospitals, then $(1 - p_1)$, the probability of going to public hospitals, is $1 - p_1 = \frac{1}{1 + e^z}$

Therefore, we can write $\frac{p_1}{1 - p_1} = \frac{1 + e^z}{1 + e^{-z}} = e^z$

Now $\frac{p_1}{(1 - p_1)}$ is simply the odds ratio in favor of going to private hospitals – the ratio of the probability that a patient will go to private hospital to that it will go to public hospitals.

If we take the natural log, we obtain

$$L = \ln\left(\frac{p_1}{1 - p_1}\right) = Z = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3$$

That is, L is the log of the odds ratio.

Data analysis

Different statistical tools have been used to analyze the data. To observe the features of background characteristics of patients in different hospitals, cross tabulation technique was used and also the statistical significance of the results are tested through mean test and chi-square test. To get the quantitative measure of relationship between dependent and independent variables the logistic regression model was fitted and tested the significance. In this study statistical software, SPSS was used to run the regression model.

Results and Discussion

Patients can decide public hospitals or private hospitals to get services. The decision on the choice of place was based on a number of factors, which were tried to find out through asking questions from patients and also a logistic regression of dependent variable 'place' was fitted on different independent variables that we have identified from the background characteristics of patients like age, education, patient's income, family income, duration of sufferings etc. Three subsections namely background characteristics of patients, choice of hospitals and fitting logistic regression are presented here to accomplish the objective of the study.

Background characteristics of patients

Here we presented some background characteristics of the patients and made a comparison between public and private hospitals to find out the influences in choosing the hospitals.

Distribution of patients according to age and educational status

Age distribution of gall-stone patients showed that above half (58.6%) of the patients were in age group 31 to 50 years and about one fourth patients of private hospitals were

in 50-60 age group. No patients were in age less than 10 years and only 2.9 % patients were in age group 11 – 20 years. The means age of the patients were 40.7 years and 44.4 years for public and private hospitals respectively and overall mean age was 42.56 years. The mean test shows insignificant difference at 5% level of significance between the two mean ages of public and private hospitals (Table 1). Again educational status revealed that about one fourth (25.7%) of the total patients completed the class VI – IX and 15.7% of total patients were masters pass and another 15.7% patients belonged to class I – V. Illiterate and below primary educated patients treated more in public hospitals (71.4%, 57.1% and 65.2%) than in private hospitals. Among the patients of masters pass, 63.6% treated in private hospitals and rest 36.4% treated in public hospitals. About half of the patients in private hospitals were SSC and above educated; and 20% patients in private hospitals were masters pass. In public hospitals SSC and above educated were 37.1% (Table 1). Therefore, less educated people comparatively treated more in public hospitals and more educated people comparatively treated more in private hospitals.

Table 1: Age and educational distribution of patients

Age Group	Frequency (Percentage)		Total		
	Public	Private			
11-20	1(1.4)	3(4.3)	4(2.9)		
21-30	14(20.0)	9(12.9)	23(16.4)		
31-40	20(28.6)	20(28.6)	40(28.6)		
41-50	26(37.1)	16(22.9)	42(30.0)		
51-60	5(7.1)	17(24.3)	22(15.7)		
60+	4(5.7)	5(7.1)	9(6.4)		
Total	70(100.0)	70(100.0)	140(100.0)		
Mean	40.7	44.4	42.56		
<i>Mean test</i>	<i>t-value = -1.742, p<0.1</i>				
Educational status	Public		Private		Total
	Frequency	Col %	Frequency	Col %	
Illiterate	5	7.1	2	2.9	7(5.0)
Can sign only	8	11.4	6	8.6	14(10.0)
Class I-V	15	21.4	7	10.0	22(15.7)
Class VI-IX	16	22.9	20	28.6	36(25.7)
SSC	9	12.9	6	8.6	15(10.7)
HSC	4	5.7	6	8.6	10(7.1)
Degree	4	5.7	6	8.6	10(7.1)
Masters	8	11.4	14	20.0	22(15.7)
Madrasa education	1	1.4	3	4.3	4(2.9)
Total	70	100.0	70	100.0	140(100.0)

Monthly income distribution of the patient and their family

Almost half of the total patients were not involved with earning and 21.4 percent of the patients had earning of Tk. 5001 – 10000. Only 5 percent of total patients had earning more than Tk.15000 and almost all of them treated in private hospitals. Among the patients having income 10001 - 15000, mostly (64.3%) treated in private hospitals. On the other hand patients having no income treated more (54.9%) in public hospitals. The mean incomes per month were Tk. 7816.1 and Tk. 11692.1 for the patients of public and private hospitals respectively and the mean test shows significant ($p=0.029$) difference between the two means. The overall mean income per month of the patients was Tk. 9950.70. Income distribution of patient's family showed that 28.6 percent patient's family had the income of Tk. 10001-15000 followed by 27.9 percent had Tk. 5001-10000 and 12.9 percent had Tk. 20001-30000. It is observed that two third of the patients family had income less than Tk.15000 and they mostly treated in public hospitals (85.7%, 64.1% and 50.0% respectively). On the other hand, one third of the patient's family had income more than Tk.15000 and they mostly treated in private hospitals except the income group Tk. 20001-30000. The mean incomes of patient's family per month were Tk. 11700.0 and Tk. 23857.1 for public and private hospitals respectively showing significant ($p=0.002$) difference between the two means. The overall mean family income per months was Tk. 17778.6 (Table 2). Therefore, income distribution illustrated that lower income group mostly treated in public hospitals and higher income group mostly treated in private hospitals and mean income of the patients of public hospitals significantly lower than that of private hospitals.

Table 2: Monthly income distribution of the patient and their family

Patient's Income	Public		Private		Total
	Frequency	Col %	Frequency	Col %	
No income	39	55.7	32	45.7	71(50.7)
1000-5000	8	11.5	10	14.3	18(12.9)
5001-10000	17	24.3	13	18.6	30(21.4)
10001-15000	5	7.1	9	12.9	14(10.0)
15001-20000	0	0.0	1	1.4	1(0.7)
20001-30000	1	1.4	5	7.1	6(4.3)
Total	70	100.0	70	100.0	140(100.0)
Mean	7816.1		11692.1		9950.7
Mean test	<i>t-value = -2.226; p<0.05</i>				

Family Income	Public		Private		Total
	Frequency	Col %	Frequency	Col %	
1000-5000	12	17.1	2	2.9	14(10.0)
5001-10000	25	35.7	14	20.0	39(27.9)
10001-15000	20	28.6	20	28.6	40(28.6)
15001-20000	7	10.0	9	12.9	16(11.4)
20001-30000	2	2.9	16	22.9	18(12.9)
30001-40000	3	4.3	1	1.4	4(2.9)
40001-60000	0	0.0	6	8.6	6(4.3)
60000+	1	1.4	2	2.9	3(2.1)
Total	70	100.0	70	100.0	140(100.0)
Mean	11700.0		23857.1		17778.6
Mean test	<i>t-value = -3.191; p<0.01</i>				

Duration of sufferings of patients before admission in hospital

Regarding the duration of sufferings before admission in hospital, patients of gall stone surgery concentrated more in 3 – 6 months (25.0%), followed by 1-2 years (20.0%) and 1-3 months (17.9%) of sufferings (Table 3). About 13.6 percent of total patients suffered less than one month and most of them (89.5%) treated in private hospitals. On the other hand, patients whom suffered more than one month to one year, mostly treated in public hospitals (56.0%, 74.3% and 83.3% respectively). Interestingly, patients whom suffered more than one year got treatment more from private hospitals (60.7%, 57.1% and 75.0% respectively). The average day of sufferings of patients before admission in hospital was 370.43 days but it was higher in private hospitals (421.04) than in public hospitals (319.81) although the difference was insignificant.

Table 3: Duration (days) of sufferings of patients before admission in hospital

Duration	Public		Private		Total
	Frequency	Col %	Frequency	Col %	
≤1 month	2	2.9	17	24.3	19(13.6)
1-3 months	14	20.0	11	15.7	25(17.9)
3-6 months	26	37.1	9	12.9	35(25.0)
6-9 months	5	7.1	1	1.4	6(4.3)
9-12 months	8	11.4	8	11.4	16(11.4)
1-2 year	11	15.7	17	24.3	28(20.0)
2-5 years	3	4.3	4	5.7	7(5.0)

Duration	Public		Private		Total
	Frequency	Col %	Frequency	Col %	
5+ years	1	1.4	3	4.3	4(2.9)
Total	70	100.0	70	100.0	140(100.0)
Mean	319.81 days		421.04 days		370.43 days
Mean test	<i>t-value = -1.084; p>0.1</i>				

Distribution of family income and education with duration of sufferings

It is observed from table 4 that 22.6 percent patients of lower income group (less than Tk. 10000) and one-third patients of middle income group (Tk. 10001 to 30000) suffered less than 3 months before admission and rest of the large number of patients suffered more than 3 months. In contrast, more than half (53.8%) of higher income group (more than Tk. 30000) suffered less than 3 months before admission and rest (46.2%) suffered more than 3 months. So it is observed that duration of suffering of patients before admission was high in lower and middle income group and low in higher income group. Although, Chi-Square test shows that there was no significant ($p=.147$) relationship between family income and duration of sufferings. Similarly, illiterate, primary and secondary educated patients suffered more (more than 3 months) in comparison to the above secondary educated patients. Regarding the distribution of education and duration of sufferings, we observed from the Chi-square test that there was significant ($p=.053$) relationship (considering 10% level of significance) between education and duration of sufferings although at 5% level of significance the relationship was insignificant.

Table 4: Cross table of family income and education with duration of sufferings

Sufferings	Family Income			Total
	Less than 3 months	3 months to 1 year	Above 1 year	
Lower income (≤ 10000) group	12(22.6)	27(51.0)	14(26.4)	53(100.0)
Middle income (10001-30000) group	25(33.8)	26(35.1)	23(31.1)	74(100.0)
Higher income (≥ 30000) group	7(53.8)	4(30.8)	2(15.4)	13(100.0)
Total	44	57	39	140
Chi-Square test	χ^2 (chi-square) = 6.797; $p>0.1$			

Sufferings	Education			Total
	Less than 3 months	3 months to 1 year	Above 1 year	
Illiterate	3(42.8)	0	4(57.2)	7(100.0)
Primary	10(25.0)	17(42.5)	13(32.5)	40(100.0)
Secondary	14(27.5)	20(39.2)	17(33.3)	51(100.0)
Above secondary	17(40.5)	20(47.6)	5(11.9)	42(100.0)
Total	44	57	39	140
Chi-Square test	χ^2 (chi-square) = 12.419, $p<0.1$			

Choice of hospitals

Patients opined some reasons for selecting the hospital, which are discussed here.

Reasons for selecting the hospital

The reasons behind selecting public or private hospitals were asked to the patients and multiple answers were replied (Table 5). Considering low cost of treatment (72.9%) was the main reason for selecting public hospitals as there was no operation cost in public hospitals. Other reasons for selecting public hospitals were the advice of doctors (37.1%), quality care (30.0%) and consideration of other related costs (21.4%).

Patients of private hospitals thought that quality care was more ensured in private hospitals and so this was the main reason (62.9%) for selecting private hospitals. Treatment takes less time (34.3%), doctor's advice (30.0%), and nearest to the living place (12.9%) were other reasons for selection of private hospitals.

Table 5: Reasons for selecting this hospital (multiple)

Reasons	Frequency		Total
	Public	Private	
Considering low cost of treatment	51(72.9)	8(11.4)	59(42.1)
Considering other related cost	15(21.4)	4(5.7)	19(13.6)
Due to quality care	21(30.0)	44(62.9)	65(46.4)
Due to doctor's advice	26(37.1)	21(30.0)	47(33.6)
Treatment takes less time	1(1.4)	24(34.3)	25(17.9)
Nearest to the living place	1(1.4)	9(12.9)	10(7.1)
Others	2(2.9)	7(10.0)	9(6.4)
Total	70	70	140

Persons advised patients to admit the hospital

Patients were asked about the person by whom they were advised to choose the hospitals. In reply, 58.6 percent patients of public hospitals informed that they were advised by doctors; about one-fourth were reported to be recommended by relatives or friends and 14.3 percent decided by themselves. About choosing private hospitals, highest 41.4 percent of the patients replied that they were advised by relatives or friends, followed by 37.1 percent by doctors and 12.9 percent decided by themselves (Table 6). So, patients of public hospitals were mostly influenced by doctors and patients of private hospitals were more influenced by relatives or friends.

Table 6: Persons advised patients to admit the hospital (multiple)

Persons advised	Frequency		Total
	Public	Private	
Self	10(14.3)	9(12.9)	19(13.6)
Doctor	41(58.6)	26(37.1)	67(47.9)
Relatives / friends	18(25.7)	29(41.4)	47(33.6)
Others	4(5.7)	6(8.6)	10(7.1)
Total	70	70	140

Reasons for not selecting Private / public hospitals

Patients of public hospitals were asked about the reasons for not going to private hospitals and in reply multiple answers were found (Table 7). About three-fourth of them informed that much money needed in private hospitals and 40.0 percent said that money needs at a time. Lack of experienced doctors was also another reason for not selecting private hospitals, mentioned by 17.1 percent patient of public hospitals.

Same question was asked to the patients of private hospitals and in reply half of the private patients informed that service of public hospitals was not satisfactory, 45.7 percent said that treatment in public hospitals was time consuming and 40.0 percent thought that doctors were not experienced in public hospitals. Another 28.6 percent thought that quality of operation was not satisfactory in public hospitals. Over crowd in public hospitals was also mentioned by 10.0 percent patients of private hospitals as a reason for not selecting the public hospital for treatment.

Table 7: Reasons for not selecting Private/public hospitals (multiple)

Reasons	Frequency		Total
	Public	Private	
Much money needed	53(75.7)	4(5.7)	57(40.7)
Money needs at a time	28(40.0)	0	28(20.0)
Lack of experienced doctors	12(17.1)	28(40.0)	40(28.6)
Operation is not satisfactory	3(4.3)	20(28.6)	23(16.4)
Service is not satisfactory	1(1.4)	35(50.0)	36(25.7)
Over crowd	0	7(10.0)	7(5.0)
Time consuming	0	32(45.7)	32(22.9)
Doctors not available all time	0	5(7.1)	5(3.6)
Others	3(4.3)	5(7.1)	8(5.7)
Total	70	70	140

Hospital preference of patients for getting treatment

Patients were asked whether they preferred public hospitals or private hospitals for getting treatment of gall stone operation and in reply 88.3 percent patients of public hospitals opined that they prefer public hospitals and the rest 11.7 percent preferred private hospitals (Table 8). On the other hand, 80.0 percent of patients of private hospitals preferred private hospitals and rest 20.0 percent preferred public hospitals. Therefore, it is observed that patients of public hospitals were more consistent to get treatment in public hospitals than that of private hospitals. That is patients of private hospitals preferred private hospitals more in comparison to their counterpart. Above all, among all the patients, 54.2 percent preferred public hospital's service and 45.8 percent preferred private hospital's services.

Table 8: Hospital preference of patients for getting treatment

Hospital Preference	Frequency (percentage)		Total Percent
	Public	Private	
Public	53 (88.3)	14 (20.0)	54.2
Private	7 (11.7)	56 (80.0)	45.8
Total	60(100.0)	70(100.0)	100.0

*10 missing value occurred in questionnaires of patients of public hospital.

Fitting logistic regression

Before fitting logistic regression influential variables effecting choice of place were found out. Results of background characteristics showed that less educated people comparatively treated more in public hospitals and more educated people comparatively treated more in private hospitals. So education was an important variable for choosing private or public hospitals. Patients having income more than Tk. 10000 mostly treated in private hospitals and family income influences the choice of place for operation. We also observed that patients suffered short time mostly treated in private hospitals and patients suffered long time mostly treated in public hospitals. So, duration of sufferings is also an influential factor. Moreover, advice of person was an important variable. Therefore, we select the variables like age, education, income, duration of sufferings and advice of person as independent variables. Besides, a number of variables had been run and retained only those variables which had significant influence in fitting logistic regression.

Fitting logistic regression of 'place' (dependent variable) on independent variables

Place of operation is a dichotomous variable taking values '0' for public hospitals and '1' for private hospitals. To find out the quantitative measure of influential factors affecting the choice of place of operation, we have applied the logistic regression model of 'place' as a dependent variable on independent variables like age, education, patient's income, family income, days of sufferings and person advised to admit in the hospital.

The results are presented in Table 9. It is observed that patient's own income had no significant ($p=.660$) influence to choose the place of operation. Rather patient's family income had significant influence as patients of middle income group family (Tk.10001 – Tk.30000) had 4.328 times higher chance than those of lower income group family (less than or equal Tk. 10000) of selecting private hospitals for operation than public hospitals. In addition, patients of higher income group family (more than Tk.30000) had 7.010 times more likely than those of lower income group family to go to private hospitals than public hospitals.

The variable 'age' had no significant influence to choose the place of operation. 'Education' had significant influence as primary educated patients had 8.745 times higher chance than illiterate patients to choose private hospitals. Secondary and above secondary educated patients had 12.513 and 21.291 times more likely to go to private hospitals for operation than public hospitals in comparison to illiterate patients.

Days of sufferings before admission were also an important factor for selecting place of operation. It is observed that patients suffered from three months to one year had .222 times less chance of going to private hospitals than those suffered from less than three months. So more sufferer patients had high chance to choose public hospitals and less sufferer patients had more likely to choose private hospitals. This was because more sufferer patients came from lower or middle income group family but less sufferer patients came from higher income group family (Table 4).

Person's advice was another powerful factor to choose place of operation. Advise of doctors had no significant ($p=.983$) effect but relatives or friends had high significant ($p=.011$) influence i.e. 5.774 times higher chance than self choice to select private hospitals than public hospitals as place of operation.

Table 9: Results of fitting logistic regression of 'place' on independent variables

Variable	Parameter (β)	S.E.	Wald	P-value	Exp(β) ⁰ [odds ratio]
Constant	-3.817	1.469	6.756	.009	.022
Patient's Income					
No					1.00
Yes	.227	.516	.194	.660	1.255
Family Income					
Lower income (≤ 10000) group					1.00
Middle income (10001-30000) group	1.465	.497	8.692	.003	4.328
Higher income (≥ 30000) group	1.947	.872	4.982	.026	7.010
Age					
Young (≤ 30 years)					1.00
Middle (31 – 60 years)	.144	.580	.062	.804	1.155
Old (60+ years)	.119	1.062	.013	.911	1.126
Education					
Illiterate					1.00
Primary	2.169	1.078	4.048	.044	8.745
Secondary	2.527	1.106	5.221	.022	12.513
Above Secondary	3.058	1.186	6.649	.010	21.291
Sufferings					
Less than 3 months					1.00
3 months to 1 year	-1.503	.505	8.852	.003	.222
Above 1 year	.284	.544	.272	.602	1.328
Person Advised					
Self					1.00
Doctor	-.014	.637	.000	.983	.987
Relative / Friend / Others	1.753	.694	6.389	.011	5.774
-2log-likelihood chi-square= 144.448; $p < 0.001$					

Conclusions

The study aims at presenting the assessment of factors influencing patients to choose private and public hospitals. Consideration of low cost of treatment (72.9%) and the advice of doctors (37.1%) were the main reasons for selecting public hospitals. On the other hand, getting quality care and less time to take treatment were the main reasons behind selecting private hospitals. Patients of public hospitals were mostly advised by doctors and patients of private hospitals were mostly advised by relatives or friends to select the hospitals. Patients of public hospitals informed that high operation cost was the main reason for not going to private hospitals. In contrast, patients of private hospitals informed that service of public hospitals was not satisfactory and time consuming and so they did not select public hospitals. In reply to a question of hospital preference, it is observed that patients of public hospitals were more consistent to get treatment in public hospitals than that of private hospitals.

To find out the influential factors affecting the choice of place of operation, we have applied the logistic regression model of 'place' on independent variables like age, education, patient's income, family income, days of sufferings and person advised to admit in the hospital. It is observed that patient's income had no significant influence, rather family income had significant influence as patients of middle income group family had 4.328 times higher chance and patients of higher income group family had 7.010 times more likely than those of lower income group family to go to private hospitals than public hospitals. The variable 'age' had no significant influence but 'education' had significant influence as primary educated patients had 8.745 times higher chance, secondary educated patients had 12.513 times higher chance and above secondary educated patients had 21.291 times more likely to go to private hospitals for operation than public hospitals in comparison to illiterate patients. Days of sufferings before admission were also an important factor for selecting place of operation. It is observed that patients suffered from three months to one year had .222 times less chance of going to private hospitals than those suffered from less than three months. So more sufferer patients had high chance to choose public hospitals and less sufferer patients had more likely to choose private hospitals. This was because more sufferer patients came from lower or middle income group family but less sufferer patients came from higher income group family (Table 4). Advise of relatives or friends had high significant ($p=.011$) influence i.e. 5.774 times higher chance than self choice to select private hospitals than public hospitals for place of operation.

Results obtained from this study is completely based on a representative sample determined statistically through the prevalence rate of gall-stone in the developed countries; since it has been reported that about 10-20% of adult population have cholelithiasis in developed countries [2]. No specific reference yet observed for prevalence rate in a developing country like Bangladesh. So, based on this sample size, Logistic regression analysis output may not revealed some convincing pattern of odds ratios, but that could be improved further with a larger sample size consideration.

References

1. Francis C.M. 1991. "Hospital Administration" Jaypee Brothers Medical Publications Pvt. Ltd. New Delhi, India, p.1.
2. Alam, M.M. 1993. Gall stone disease – is it increasing?, *TAJ(RAJSHHI)*, Vol 6, No 2, 75-76.
3. Damodar N. G. 1995. "Basic Econometrics" 3rd Edition, McGraw-Hill International Editions, p.554 563