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Asymmetrical Information and Health Care Industry: A Case Study on Indian Drug Stores

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Abstract

Health care systems are generally recognizing that information is an essential commodity, and the information is a key ingredient to being successful. Any absence of full information can lead to transactions that are ultimately disadvantageous for patients and physician and drugstores. An attempt is made in this study on information asymmetry with patients and drug stores with the principal component analysis of factor analysis and it was extracted 9 interpretable factors from 21 information variables that are possibly attributes the asymmetrical information. From the analysis, it is found that (a) expected role from Drug Store persons and (b) expected details about medicines purchased by the patients are the most important factors. This is because the price and the cost spent for the drugs and medicines are increasing day by day. Another important factor is related to patient "dependency" with drug stores persons and role of drug store persons in building the confidence in the minds of patients. A clear cut legal reforms on health care is required to be streamlined and right to avail the information from the agents of the health care sector viz., physicians and drug stores.

Introduction

Efficient functioning of market depends on the assumption that consumers and producers have full knowledge about product or services characteristics, available prices, and so forth. The absence of full information can lead to transactions that are ultimately disadvantageous [1] [2] [3]. Health care systems are gradually recognizing that information is an essential commodity; and that information is a key ingredient to being successful [4, p.5].

In India, Central and State governments primarily provide medical services. Certain charitable voluntary and private institutions, private individuals also provide medical services to the patients. The hospital firms in Indian economy characterized with perfect market structure, because of its one important feature viz., free flow of information between buyer and seller. In hospital industry, the physician on the one side and drug stores on the other side acts as an agents translating the demand for care by the patient into supply of services from the hospital. It is often observed that the absence of information is prevailing between all the agents of the medical services physician, drug stores and principal (patient). This nature of information asymmetry sometimes adversely affects the health and even resulted in death of the patient. A sudden loss or high cost of medication of a family head or a earning member of a family in a country like India force the family into a poverty pool.

The issue of the role of pharmacists in the greater system of health care provision is central to developing a longer-term outlook on the demand for pharmacists.

Confined to a role of dispensing medication, encroached upon by the availability of improving dispensing technologies and an expanded role of pharmacy technicians, the demand for pharmacists in the future could well decline. Given the growing evidence of drug related complications and the ability of pharmacists to anticipate and forestall many of these problems, however, a more likely scenario is that pharmacists are increasingly valued and demanded for their clinical skills and cost-effective role in the health care system [5].

Against this backdrop this paper made an attempt to study the following objectives: (a) the theoretical perspective on information asymmetry between the 'triangle' of the doctor – patient – drugstore; (b) to identify and examine the factor responsible for the information asymmetry and (c) the live cases due to asymmetrical information in the health care industry.

Earlier Views

Very limited analytical research studies are available on the health care and asymmetrical information. Large number of studies have concentrated on concepts and health problems [6] [7] [8] and empirical studies pertaining to health status of the people on the one hand and health care issues between inter and intra States and India on the other hand. Other set of earlier views are mainly concentrated on the customer satisfaction on health care services in general and doctor and nurse services in particular [9] [10] [11]. Only very few studies have discussed about the pharmacies' role in

medical services and patient satisfaction. Therefore, it is found that most of the earlier Indian studies views are descriptive works and cases [12] [13] [14] rather than analytical one. The analytical studies [15] [16] are related to Western countries and not with that of the developing countries particularly India.

Methodology and tools used

The study based on the primary data. According to the convenience method of non-random sampling procedure, 65 respondents were selected. Each respondent was independently administrated with the questionnaire of 26 relevant informational variables viz., consultation, price, quality of service, drug information, etc [17]. The response are obtained on a 5 point scale ranging from strongly agree, agree, neither agree nor disagree, disagree and strongly disagree. Apart from percentage analysis and mean score, Factor analysis method is used to know which informational factors caused the information asymmetry between patient and drug stores. KMO measures of sampling adequacy test and Cronbach's alpha tests were also performed before proceeding the principal component analysis of factor analysis.

The first section of the article deals with the theoretical 'triangle' asymmetric information between doctor – patient – drugstores. Section II presents the live cases studies and in Section III presents the empirical analysis, its findings and conclusion is given.

Section I - Asymmetry in the 'Triangle'

The following figure indicates the asymmetric information between the various constituents of the 'triangle', that is., between doctor – patient – drugstores.
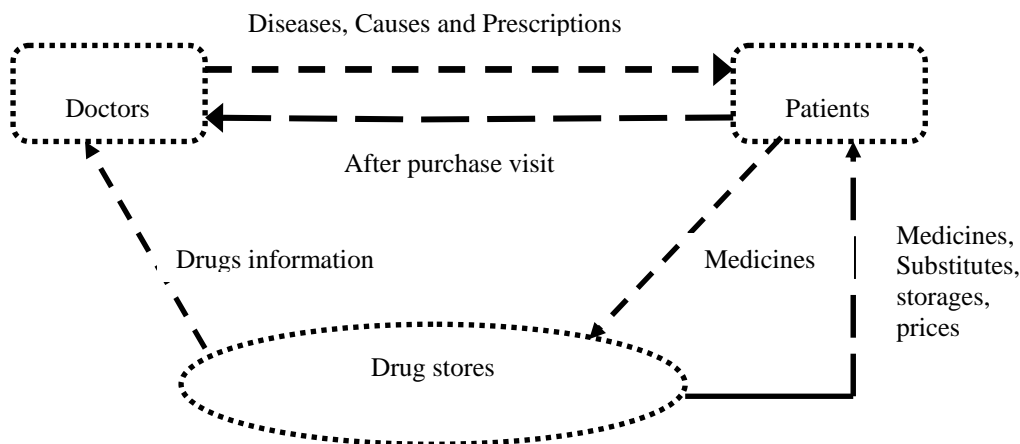
The nature of information asymmetry process between the doctor – patient – drugstores would witness with regard to the services of the physician and information related to drugs from physician as well as drug stores. The absence of information has influence not only on the economics of the market situation but also the quality of physician services / products, marketing strategies of drug stores, including pricing and long-term effect on the well being of the patients, namely customer care.

Section II: Case studies

Case 1: John Hopkins using Kerala patients as guinea pigs: A major controversy over the alleged trial of a drug on unsuspecting cancer patients at a hospital by the world-famous Johns Hopkins University of the US. The drug, tetramethyl nordihydroguiaretic acid or NDGA (M4N), was allegedly tested on 24 patients at the Regional Cancer Centre (RCC), soon after it was tested on 36 mice in the US. Reports in the local media said the drug was tried on patients suffering from head and neck tumors during 1999-2000. Several complaints have reached Chief Minister office. Also, some of the RCC doctors were planned to take matters to the court. The trial of another drug, Foscan, at the RCC has raised hackles as the Food and Drug Administration (FDA) of the US and the European committee empowered to give approval for drugs have more than once blocked clearance. A senior RCC doctor said the issue came to light "when one of the doctors in RCC found out that his patients were being used as guinea pigs for this new derivative, without his consent. "When he protested he was sidelined and he has now approached the State Human Rights Commission and the Kerala High Court for justice." "The team led by the RCC director Dr M. Krishnan Nair instead of removing the tumors on the 24 patients as soon as they were detected, delayed the surgical intervention for varying periods to find out the efficacy of the chemical on cancer cells," he said [18].

Fig. 1: Asymmetrical information between Doctor, Drugstores and Patients

Case 2: On Sunday, November 11, 2001, thousands of children throughout India were vaccinated against polio. The effort took a horrific turn in India where 500 children fell ill and at least nine died after a mass polio immunization campaign. Within 24 hours hundreds of children in the Indian state of Assam were taken to local hospitals and health officials report that nine children had died -- all from the same village. The BBC quoted non-governmental agencies as suggesting that the vaccines used in Assam may have been outdated. Regardless, clearly this is likely to be a setback to efforts to eradicate polio [18].

Case 3: The People's Union for Civil Liberties (PUCL) filed a complaint that the authorities in GB Pant Hospital, New Delhi, have been using contaminated, expired and damaged drugs, resulting in an increasing number of patients dying from hospital-acquired infections. The matter has been handed over to the CBI which is also probing another case related to the hospital. PUCL attributes the problem to a cover-up of purchase irregularities worth eighty-six crores of rupees [19].

Results and Discussion

The agreement level on various informational variables that explains the asymmetrical information behaviour is presented in table 1. The more than or equal to 50 per cent of the respondents agreed on the following informational attributes: (a) Pharmacy store sells toiletries, soaps etc. apart from medicines; (b) Shop person always gives me a bill for all the medicines purchased by me; (c) Check the printed prices before paying; (d) The expiry dates before using the medicines; (e) Check the information on how to store medicines; (f) Store the medicines on top of the refrigerator and out of reach to children; (g) All simple diseases like fever, pains I know which medicines to buy and use; (h) Store person always gives me the prescribed medicines and does not offer any substitute; (i) Store always has the medicines which my doctor has prescribed.

On the other hand, in the following variables the respondents expressed their disagreements level: (a) Acceptance of substitute medicines offered by the shop; (b) Does sell small quantities or in loose; (c) Buy my medicines based on the recommendations of the store person; (d) Buy the medicines from the store before going to the doctor; (e) Store person tells me alternative medicines that are available at a lower price than what is prescribed; (f) Pharmacy person always tells me how to store the medicines at home; (g) Store person always tells me the diet details to be observed while taking the medicines; (h) Pharmacy person always tells me the purpose of the medicines which have been prescribed.

The mean score and its standard deviation (Table 2) of the information variables are categorizes the variables and respondents agreement level. It could be inferred that out of identified 26 variables, higher degree of agreement / disagreement with the mean score above 3.1 is found with 14 variables and with another 12 variables lower degree of agreement / disagreements whose mean score more than 2. The mean scores (greater than 3) of 14 variables categorically supports that the importance attached to these expected information variables by the patients fro the drug stores. Though some of the variables scores are less than 3, reverse scores must be taken into account, so that it can be understood in a better way.

The extraction was based upon a varimax rotation; principal component analysis. The Bartlett's Test of Sphericity is extremely sensitive to the hypothesis that correlations within the correlation matrix are zero; even with a relatively small sample size of 65, PCA shows that we are able to reject the null hypothesis of no correlation (Chi-square (325) =639.34, p=0.000). The Kaiser-Meyer-Olkin Measure of Sampling adequacy (KMO=.512) is less than the suggested .6 value [21] indicating that the correlation matrix may be difficult to factor. Though there is a low KMO value, 0.512 (Table 3) is within an acceptable range to proceed [22] Cronbach's alpha is an index of reliability [23] associated with the variation accounted for by the true score of the "underlying construct." The higher the score, the more reliable the generated scale is and it has indicated 0.68 to be an acceptable reliability coefficient [24].

The PCA extracted 9 factors, which attributed for the asymmetrical information between the patients and drug stores through the varimax rotation method and the extracted factors accounted 70.36 per cent (Table 4) variance and clearly indicates that above variables (26 items) are important in explaining the asymmetrical information between the drug stores and patients.

The examination of factor analysis through principal component analysis reduced the 26 items into 9 interpretable factors. Cronbach's alpha test was also performed to measure the internal consistency of each factor and it was found that out of 9 factors, 6 factors (Table 5) values are more or less equal to the suggested cutoff value of 0.70, revealing an acceptable level of reliability. The 9 interpretable factors have brought the ideas about the patient expected informational attributes with respect to drug store persons and also reflects the their own responsibility. The theory of asymmetrical information explained that agent knows full information than that of the principal and there would be adverse selection of the commodity. In this study, some of the relevant information between drug stores person and patients is shared, but certain other relevant information are communicated not upto the expected level of the patients.

A conservative criterion loading of .40 was used to determine whether individual scale items were considered for a given factor, all items did meet the criterion cut-off and considered when identifying and naming each factor.

Factor 1: Expected role from Drug Store persons dealt with information sharing on the purpose of the medicines, the diet details to be observed while taking the medicines, buying the medicines from the store before going to the doctor, storage of the medicines at home and the dosage and how to take the medicines. Higher factor scores of the scaled items, grand mean and Cornbach's alpha value signifies the variables and this scaled item explains 10.64 per cent of variance.

The expected information on expiry dates, rates or price of the medicine and interest to know the ingredients of the medicine formed as Factor 2 viz., **Expected details about medicines.** It signifies that the patients or care takers of the patients are keen in knowing the information on expiry dates of the medicines, the prices and wanted to avoid the loose purchase of the medicine. It indicates that the role of drug stores persons in providing the information about the above stated items, so that any adverse effect due to expired drugs or over priced medicines. This factor accounts 9.10 per cent of variance. The internal consistency of the scaled items (0.74) exceeded the suggested level value.

TABLE 1: LEVEL OF AGREEMENTS IN DRUG STORES INFORMATION VARIABLES

Information Variables	Strongly Disagree	Disagree	Neither Agree Nor Disagree	Agree	Strongly Agree
Drug store sells toiletries, soaps etc. apart from medicines	2 (3.10)	7 (10.80)	6 (9.20)	23 (35.40)	27 (41.50)
Acceptance of substitute medicines offered by the shop	16 (24.60)	21 (32.30)	17 (26.20)	11 (16.90)	-
Drug store person always gives me a bill for all the medicines purchased by me	4 (6.20)	10 (15.40)	12 (18.50)	25 (38.50)	14 (21.50)
Does not sell small quantities or in loose	15 (23.10)	23 (35.40)	16 (24.60)	8 (12.30)	3 (4.60)
Drug store person never gives me the box, just the cut stripes or open bottles	5 (7.70)	16 (24.60)	18 (27.70)	15 (23.10)	11 (16.90)
Check the printed prices before paying	6 (9.20)	11 (16.90)	14 (21.50)	21 (32.30)	13 (20.00)
The expiry dates before using the medicines	-	5 (7.70)	5 (7.70)	17 (26.20)	38 (58.50)
Expiry date information is always seen clearly	1 (1.50)	9 (13.80)	19 (29.20)	19 (29.20)	17 (26.20)
Do not have to check the expiry dates as the store owner always checks it	17 (26.20)	15 (23.10)	13 (20.00)	10 (15.40)	10 (15.40)
Expiry dates are not clear in many cases	10 (15.40)	11 (16.90)	22 (33.80)	19 (29.20)	3 (4.60)
Rates are not clear in many cases	10 (15.40)	12 (18.50)	18 (27.70)	23 (35.40)	2 (3.10)
No information on how to store the medicines	15 (23.10)	16 (24.60)	17 (26.20)	11 (16.90)	6 (9.20)
Check the information on how to store medicines	6 (9.20)	6 (9.20)	10 (15.40)	24 (36.90)	19 (29.20)
Keep all my medicines in the refrigerator	3 (4.60)	17 (26.20)	24 (36.90)	16 (24.60)	5 (7.70)
Drug store the medicines on top of the refrigerator and out of reach to children	5 (7.70)	5 (7.70)	10 (15.40)	29 (44.60)	16 (24.60)
Buy my medicines based on the recommendations of the store person	13 (20.00)	29 (44.60)	13 (20.00)	6 (9.20)	4 (6.20)
Buy the medicines from the store before going to the doctor	24 (36.90)	17 (26.20)	13 (20.00)	8 (12.30)	3 (4.60)
All simple diseases like fever, pains I know which medicines to buy and use	3 (4.60)	14 (21.50)	12 (18.50)	18 (27.70)	18 (27.70)

(Table Contd.,)

Drug store person tells me alternative medicines that are available at a lower price than what is prescribed	13 (20.00)	24 (36.90)	9 (13.80)	16 (24.60)	3 (4.60)
Drug store person always gives me the prescribed medicines and does not offer any substitute	3 (4.60)	8 (12.30)	19 (29.20)	17 (26.20)	18 (27.70)
Drug store person always tells me the dosage and how to take the medicines	9 (13.80)	10 (15.40)	17 (26.20)	23 (35.40)	6 (9.20)
Drug store person always tells me how to store the medicines at home	13 (20.00)	22 (33.80)	20 (30.80)	5 (7.70)	5 (7.70)
Drug store person always tells me the diet details to be observed while taking the medicines	10 (15.40)	20 (30.80)	20 (30.80)	11 (16.90)	4 (6.20)
Drug store person always tells me the purpose of the medicines which have been prescribed	10 (15.40)	23 (35.40)	13 (20.00)	15 (23.10)	4 (6.20)
Drug store person always makes note of the doctor who prescribed the medicines from the prescription	10 (15.40)	10 (15.40)	18 (27.70)	21 (32.30)	6 (9.20)
Drug store always has the medicines which my doctor has prescribed	2 (3.10)	13 (20.00)	15 (23.10)	22 (33.80)	13 (20.00)

Figures in brackets are percentages
Source: Field Survey

TABLE 2: MEAN SCORE OF THE INFORMATION VARIABLES

	Information Variables	Mean	Standard Deviation
1	Drug store sells toiletries, soaps etc. apart from medicines	4.02	1.11
2	Acceptance of substitute medicines offered by the shop	2.35	1.04
3	Drug store person always gives me a bill for all the medicines purchased by me	3.54	1.17
4	Does not sell small quantities or in loose	2.40	1.12
5	Drug store person never gives me the box, just the cut stripes or open bottles	3.17	1.21
6	Check the printed prices before paying	3.37	1.24
7	The expiry dates before using the medicines	4.35	0.93
8	Expiry date information is always seen clearly	3.65	1.07
9	Do not have to check the expiry dates as the store owner always checks it	2.71	1.41
10	Expiry dates are not clear in many cases	2.91	1.13
11	Rates are not clear in many cases	2.92	1.14
12	No information on how to store the medicines	2.65	1.27
13	Check the information on how to store medicines	3.68	1.25
14	Keep all my medicines in the refrigerator	3.05	1.01
15	Store medicines on top of the refrigerator and out of reach to children	3.71	1.16
16	Buy my medicines based on the recommendations of the store person	2.37	1.10
17	Buy the medicines from the store before going to the doctor	2.22	1.21
18	All simple diseases like fever, pains I know which medicines to buy and use	3.52	1.24
19	Drug store person tells me alternative medicines that are available at a lower price than what is prescribed	2.57	1.20
20	Drug store person always gives me the prescribed medicines and does not offer any substitute	3.60	1.16
21	Drug store person always tells me the dosage and how to take the medicines	3.11	1.20
22	Drug store person always tells me how to store the medicines at home	2.49	1.13
23	Drug store person always tells me the diet details to be observed while taking the medicines	2.68	1.12
24	Drug store person always tells me the purpose of the medicines which have been prescribed	2.69	1.17
25	Drug store person always makes note of the doctor who prescribed the medicines from the prescription	3.05	1.22
26	Drug store always has the medicines which my doctor has prescribed	3.48	1.12

TABLE 3: KMO AND BARTLETT'S TEST VALUE

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.512
Bartlett's Test of Sphericity	Chi-Square (df=325	639.34
	Sig	0.00
Cronbach's Alpha		.6867

TABLE 4: VARIANCE EXPLAINED BY THE FACTORS

	Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.23	16.26	16.26	2.77	10.64	10.64
2	2.71	10.42	26.69	2.37	9.10	19.74
3	2.30	8.86	35.54	2.21	8.50	28.24
4	1.90	7.31	42.85	2.09	8.06	36.30
5	1.71	6.57	49.43	2.05	7.89	44.19
6	1.64	6.32	55.74	1.93	7.41	51.60
7	1.42	5.45	61.19	1.92	7.40	59.00
8	1.29	4.97	66.16	1.55	5.97	64.97
9	1.09	4.19	70.36	1.40	5.39	70.36

TABLE 5: FACTORS DETERMINES ASYMMETRICAL INFORMATION BETWEEN DRUG STORES AND PATIENTS

Factor	Factor Score	Grand Mean	Alpha
Factor 1: Expected role from Drug Store persons			
Drug store person always tells me the purpose of the medicines which have been prescribed	0.80	2.64	0.75
Drug store person always tells me the diet details to be observed while taking the medicines	0.68		
Buy the medicines from the store before going to the doctor	0.67		
Drug store person always tells me how to store the medicines at home	0.67		
Drug store person always tells me the dosage and how to take the medicines	0.46		
Factor 2: Expected details about medicines		2.74	0.74
Expiry dates are not clear in many cases	0.92		
Rates are not clear in many cases	0.88		
Does not sell small quantities or in loose	0.50		
Factor 3: Patients' believability		2.48	0.66
Acceptance of substitute medicines offered by the shop	0.77		
Do not have to check the expiry dates as the store owner always checks it	0.71		
Buy medicines based on the recommendations of the store person	0.65		
Factor 4: Drug persons versus company and doctor		3.05	0.54
Keep all necessary medicines in the refrigerator	0.76		
Drug store person always makes note of the doctor who prescribed the medicines from the prescription	0.59		
Factor 5: Accepting one's own responsibility		3.62	0.48
Check the information on how to store medicines	0.73		
Expiry date information is always seen clearly	0.73		
All simple diseases like fever, pains I know which medicines to buy and use	0.45		
Factor 6: Information sought and verification		3.60	0.04
Pharmacy store sells toiletries, soaps etc. apart from medicines	0.66		
Check the printed prices before paying	0.64		
No information on how to store the medicines	-0.62		
The expiry dates before using the medicines	0.51		

(Table Contd.,)

Factor 7: Right Medicine		3.54	0.62
Drug store person always gives me the prescribed medicines and does not offer any substitute	0.86		
Drug store always has the medicines which my doctor has prescribed	0.71		
Factor 8: Low priced medicine and billing		3.05	-0.81
Drug store person tells me alternative medicines that are available at a lower price than what is prescribed	-0.76		
Drug store person always gives me a bill for all the medicines purchased by me	0.73		
Factor 9: Accepting loose sales and instruction on the storage		3.44	0.37
Drug store person never gives me the box, just the cut stripes or open bottles	-0.67		
Store medicines on top of the refrigerator and out of reach to children	0.49		

Factor 1: Expected role from Drug Store persons dealt with information sharing on the purpose of the medicines, the diet details to be observed while taking the medicines, buying the medicines from the store before going to the doctor, storage of the medicines at home and the dosage and how to take the medicines. Higher factor scores of the scaled items, grand mean and Cornbach's alpha value signifies the variables and this scaled item explains 10.64 per cent of variance.

The expected information on expiry dates, rates or price of the medicine and interest to know the ingredients of the medicine formed as Factor 2 viz., **Expected details about medicines.** It signifies that the patients or care takers of the patients are keen in knowing the information on expiry dates of the medicines, the prices and wanted to avoid the loose purchase of the medicine. It indicates that the role of drug stores persons in providing the information about the above stated items, so that any adverse effect due to expired drugs or over priced medicines. This factor accounts 9.10 per cent of variance. The internal consistency of the scaled items (0.74) exceeded the suggested level value.

Factor 3: Patients' believability dealt with the patients' dependency on the drug store persons. The factor included the items like acceptance of substitute medicines offered by the shop, do not have to check the expiry dates as the store owner always checks it and buy medicines based on the recommendations of the store person.

The factor 4 reflects the drug store persons and their relationship with doctor and company. The items included under this factor are: keep all necessary medicines in the refrigerator and Store person always makes note of the doctor who prescribed the medicines from the prescription and the factor is labeled as **Drug persons versus company and doctor**. This factor attributed the variance to the level of 8 per cent.

Factor 7: Right Medicine reveals the level of confidence of the patients on the drug store persons. The scaled items viz., store person always gives me the prescribed medicines and does not offer any substitute and store always has the medicines which doctor has prescribed categorically supports that the above mentioned factor 3. This factor reflects that the drug store persons always does his duty to the patients and not act as a self-centered person or a business motive person to achieve his goal.

The drug store person sometimes suggests the alternative medicines that are available at a lower price than what was suggested by the doctor and giving the bill for the medicines purchased is included in the factor 8: **Low priced medicine and billing.**

The factor **5 (Accepting one's own responsibility), 6 (Information sought and verification) and** factor 9 (**Accepting loose sales and instruction on the storage**) are considered as less important informational items, because of the less reliability of the data (Cornbach's alpha values are less than the suggested value).

Conclusion

From the empirical investigation it is found that the 9 interpretable factors are attributed for the asymmetry information between drug stores (agent) and patients (principal), the important factors are: (a) expected role from Drug Store persons and (b) expected details about medicines purchased by the patients. This is because the price and the cost spent for the drugs and medicines are increasing day by day. It is often noticed that the price difference between 'Generic' name of medicine and 'Brand' name is very high. Physicians have a greater role and create awareness to the patients to buy the 'Generic' form of medicines.

Another important factor is related to patient "dependency" with drug stores persons and role of drug store persons in building the confidence in the minds of patients.

The listed live cases categorically supported the factors of the asymmetrical information and its impact on the patients through contaminated drugs, ignorance, etc in the health care sector. Not only these case studies, there are many live cases which emphasizes the selling of

fake drugs through the Over the Counter sales, using contaminated drugs and injections to the patients, etc. the another common cases witnessed in Indian hospital industry especially in large hospital, superspeciality and multispeciality are that the physicians or consultants and the hospital administration are forced the patients and / or care takers to buy the medicines with their own drug stores.

The most common features is that for the top 10 diseases like head ache, fever, dry cough, body pain, the patients who affected just walk into the drug stores and purchase the medicine from the drug stores without doctor prescriptions. The other occasions, the chronic diseased people normally purchase the medicine based on used medicine strips, not even with the prescription sheet of the physicians.

Under the above circumstances, the role of drug store persons is vital. It was stated in Canadian Newswire Services [25] that Pharmacists, as the most accessible of the primary health care providers, have a wealth of information and expertise to share. Pharmacists also offer solutions to some of the challenges facing the health care system …….. Through one-on-one consultation with their patients, pharmacists can change these staggering numbers. Thus, this literature supports the study's importance in a developing countries in general and India in particular.

A clear cut legal reforms on health care is required to be streamlined and right to avail the information from the agents of the health care sector viz., physicians and drug stores.

Limitations and Future Research

The major limitation of the present study is related to the sample size. It is also evident from the analysis and the test statistics like Kaiser-Meyer-Olkin Measure of Sampling Adequacy and Cronbach's alpha. The application Structural Equation Modelling (SEM) would give much better understand of the variables under study and that could be the second limitation of the study. However, this study provides an empirical and theoretical idea related to the principal – agent communication gap or information asymmetry and adverse effect in the health care industry.

The author suggested the following areas for further research: first investigation on price of the generic and branded medicines, use of expired and spurious drugs or medicines and its adverse effect on family. Secondly, an indepth study with respect to doctor and drug stores and their communication process with patient by taking into consideration of all relevant information attributes is need of the hour.

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