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TQM - CUSTOMER SATISFACTION RELATIONSHIP IN PHARMACEUTICAL DISTRIBUTION CENTERS

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BACK GROUND OF THE STUDY

Customer satisfaction has long been recognized as one of the critical success factor in today's competitive business environment as it affects companies' market share and customer retention (Ooi et al. 2011). O'Sullivan and Mc Callig (2012) also find that customer satisfaction positively and significantly moderates the earnings-firmvalue relationship as customer satisfaction is key operational performance measure for all business concerns (Terziovski. 2006).

Since the mid-1980s, when quality management became a widely practiced way to improve product quality, reduce costs and improve customer service, the issue of customer satisfaction has brought about a great deal of ongoing debate (Gustafsson and Johnson, 2004; Wirtz and Lee, 2003). According to Fynes and Voss (2002), one of the most problematic issues confronting a researcher in quality management is the search for an appropriate definition and therefore the definition of satisfaction also shows a strong heterogeneity (Florence *et at.*, 2006). Different authors have defined satisfaction in different ways but Giese and Cote (2000) found that three overall components within virtually every definition of satisfaction might be identified as these capture the specifics of the concept. These components are

- A response (affective or cognitive).
- The response concerns a particular focus (e.g. expectations, product and consumption experience).
- The response takes place at a particular point in time (e.g. after choice, after transaction, after consumption, based on accumulated experience).

Awan (2008) concludes that customer satisfaction is mainly influenced by affective states (emotions) and cumulative satisfaction has more vital role in economic success of the companies as compared to the transaction specific satisfaction. The actual question is how to achieve, maintain and improve customer satisfaction? TQM is one such philosophy which can help organizations to achieve, maintain and improve customer satisfaction. According to Agus *et al.*, (2000) TQM implementation strengthens customer satisfaction and improves company's financial performance. From its inception the concept of TQM is focused on customer satisfaction hence it is not surprising that TQM literature has given much emphasis on customer satisfaction (Mehra and Ranganathan, 2008). Because of effect of TQM on customer satisfaction, there is hardly any management philosophy that is as widely adopted by companies as quality management (Fisscher and Nijhof, 2005).

Previous studies in TQM can be categorized along several main research objectives. These include identifying critical TQM factors, examining issues and/or barriers in the implementation of TQM and investigating the link between TQM factors and performance (Sebastianelli and Tamimi, 2003). Mehra and Ranganathan (2008) searched for studies which had TQM as the independent variable and customer satisfaction as the dependent variable. Findings were quite surprising as only few studies have researched the direct relationship between TQM and customer satisfaction although the customer satisfaction is the central component of almost every definition of TQM presented by TQM researchers in last three decades. This research is thus focused on establishing the link between TQM and customer satisfaction.

In the continually changing global market, quality products alone are not enough and new challenges now include a focus on supply to determine the right time and place for product and service delivery. The global business competition is no longer between the organizations but between their supply chains (Li et al. 2006). Therefore, leading companies have adopted Supply Chain Management (SCM) and TQM philosophies to strengthen their organizational performance. Vanichchinchai and Igel (2009) comprehensively reviewed and compared the concepts of TQM and SCM (Table 1) and found that although origin and primary goal of these both disciplines are separate, the ultimate goal of both of these leading business philosophies is same i.e. customer satisfaction.

Table 1: Similarities and Differences between TQM and SCM

Concepts	**TQM**	**SCM**
Perspective (example)	Management philosophy and large-scale management system	Management philosophy and large-scale management system
Original function	Quality inspection	Logistics
Evolutional stage	Inspection →QC → QA → TQM	Logistics → SCM → SSC (Seamless supply chain)
Maturity stage (example)	(1) Unaware (2) uncommitted (3) initiator (4) improver and (5) achiever (Chin et al., 2002)	(1) Baseline (2) functional integration (3) internal integration and (4) external integration (Stevens, 1989)
Ultimate goal	Customer satisfaction	Customer satisfaction
Primary goal	Specification-based performance or quality (Q)	Time-based performance or delivery (D)
Ultimate integration	Both internal and external integration	Both internal and external integration
Primary integration	Internal participation (executives and employees)	External partnership (suppliers and customers)

Source: Vanichchinchai and Igel (2009)

Both SCM and TQM concepts have been studied in detail in last years but these two concepts have been studied rarely together (Casadesus and Castro, 2005). This study has thus focused on establishing the link of TQM and customer satisfaction in a component of pharmaceutical supply chain.

Narayana et al. (2012) reviewed 304 studies published in 48 journals during 1999-2009 and provided a holistic review of management research in the pharmaceutical industry 304 studies were categorized into 10 major issues. Issue wise breakup of these studies is given in figure 1.

FIGURE 1 HERE

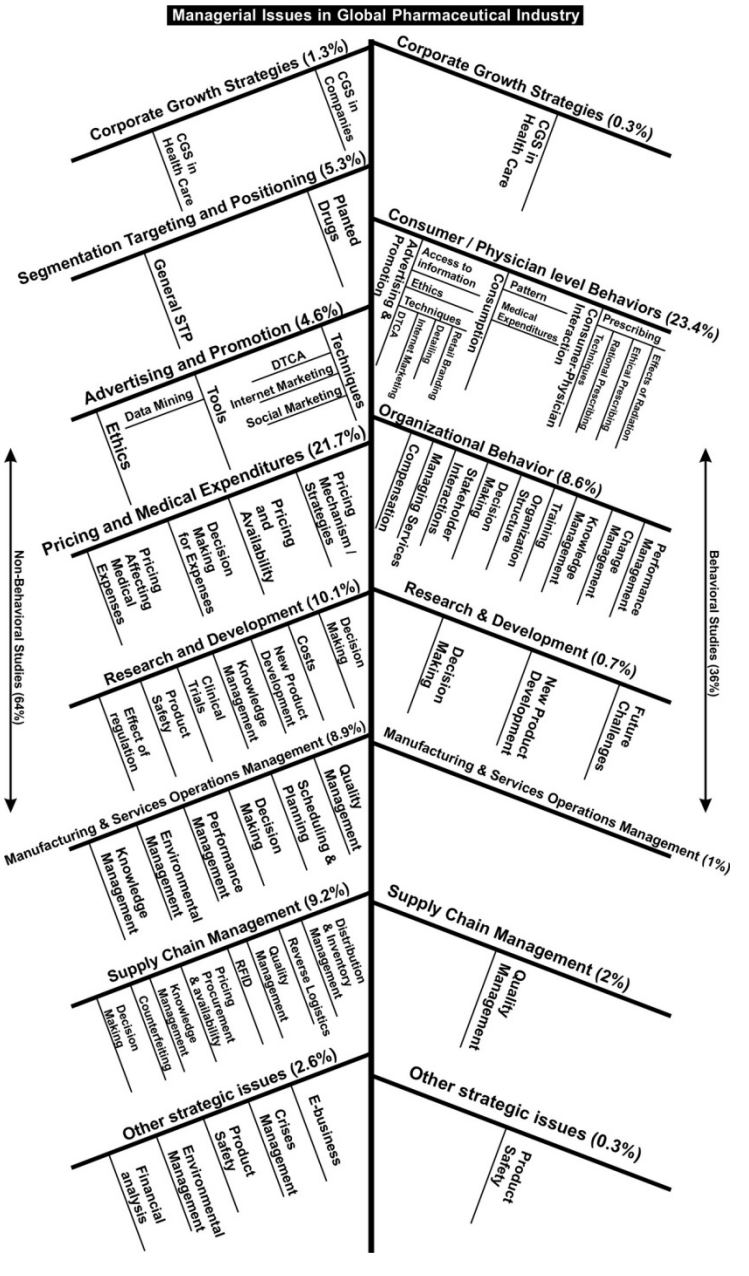
Supply Chain Management is one of these issues. In the past, pharmaceutical companies did not adopt supply chain management concepts (Geimer and Tomlinson, 2002). However, now several factors are pressing pharmaceutical companies to change their traditional manners of conducting business. One of these factors is that the supply

chain is becoming a source of competitive advantage (Ahmad 2009). More secure and fully traceable supply chain is therefore needed with in the pharmaceutical industry (Kumar et al., 2009). However, the supply chain factor is neglected in previous research. Only 11.2% of the research articles reviewed by Narayan et al (2012) are about pharmaceutical supply chain management. 8.9%/11.2% supply chain management studies have been done in American and European region. It indicates a need for more research focus on the pharmaceutical supply chain management issues research in developing countries.

A typical pharmaceutical supply chain consists of the one or more of the following nodes (Shah, 2004):

(i) Primary manufacturing (possibly including contractor sites);
(ii) Secondary manufacturing (possibly including contractor sites);
(iii) Market warehouses/distribution centers;
(iv) Wholesalers; and
(v) Retailers/hospitals.

Pharmaceutical distributions centers have been selected for this study as distribution centers are the central component of the pharmaceutical supply chain and according to Quick et al., (1997) drug distribution is concerned with bringing a medicine from the manufacturer to the patient. Government agencies and third party payers expect the provision of pharmaceutical products to be cost effective, keeping costs to a minimum so strategic planning has become imperative for all organizations in the pharmaceutical distribution system (Birdwell, 1994). Lorentz et al. (2007) proposes that distribution system evolution in emerging markets influences the supply chain decisions (distribution channel selection and prioritization, middle-man selection, role evaluation and allowing for more direct distribution) of the companies. Limited emphasis on the enforcement of the distribution of medicines could potentially result in increased access to substandard and counterfeit medicines.



Keeping in view the above mentioned research gaps, following research question has been developed for this study.

RQ: Does TQM implementation directly influences customer satisfaction in pharmaceutical distribution centers?

It is expected that answer to this question will significantly contribute in the existing literature in multiple ways. There have been fewer studies on the direct relationship of TQM implementation on customer satisfaction. There have been fewer studies which have studied TQM and SCM together. There have been very fewer studies which have focused on pharmaceutical supply chains in general and in developing countries in particular. This study will contribute in all three above mentioned dimensions of existing knowledge.

The next section in the paper is the methodology section followed by data analysis and discussion.

METHODOLOGY

This study is a part of Ph.D. study entitled "Development of Pharmaceutical Distribution Model for Customer Satisfaction". Questionnaire used by Rao *et al.*, (1999) was chosen for modification using focus group discussion. There were many reasons for choosing this particular study. Validation in developed and developing countries - including a neighboring developing country, India was the main reason for the selection of this questionnaire. While the questionnaires developed by Saraph *et al.*, (1989), Flynn *et al.*, (1994), Ahire *et al.*, (1996) and Grandzol and Gerhson (1998) were developed in the United States and the questionnaire suggested by Joseph *et al.*, (1999) was developed only in India.

Morgan (1993) proposes the use of focus groups to adjust survey instruments to new populations. Questionnaire was refined keeping in view the suggestions given by 10 representatives of pharmaceutical distribution companies in the focus group discussion. There were two main objectives of this focus group discussion. One was to redevelop constructs and second was to refine the elements in each construct. After focus group discussion no. of constructs reduced from 13 to 10. Table 1 compares the constructs and number of items in each construct in Rao *et al.*, (1999) questionnaire and questionnaire refined after focus group discussion.

Table 1: Comparison of Rao et al., (1999) Questionnaire and Questionnaire refined after Focus Group Discussion

Title of the construct (Rao *et al.* 1999)	**Number of items in Rao *et al.* (1999) questionnaire**	**Title of the construct (refined questionnaire)**	**Number of items in refined questionnaire**
Top management support	7	Top management support	5
Strategic planning process of quality management	4	Strategic planning process of quality management	2
Quality information availability	3	Quality information availability and usage	4
Quality information usage	3		
Employee training	4	Employee training	3
Employee involvement	5	Employee involvement	4
Product/process design	5	Process design	3
Supplier quality	6	Supplier quality	2
Customer orientation	8	Customer Focus and Satisfaction	6
Quality citizenship	4	This construct was deleted	
Benchmarking	4	Benchmarking	2
Internal quality results	5	Results of implementing quality management	4
External quality results	4		
	62		35

The research question for this research is about the linkage of TQM implementation on customer satisfaction so the theoretical framework given in figure 2 was developed for this study.

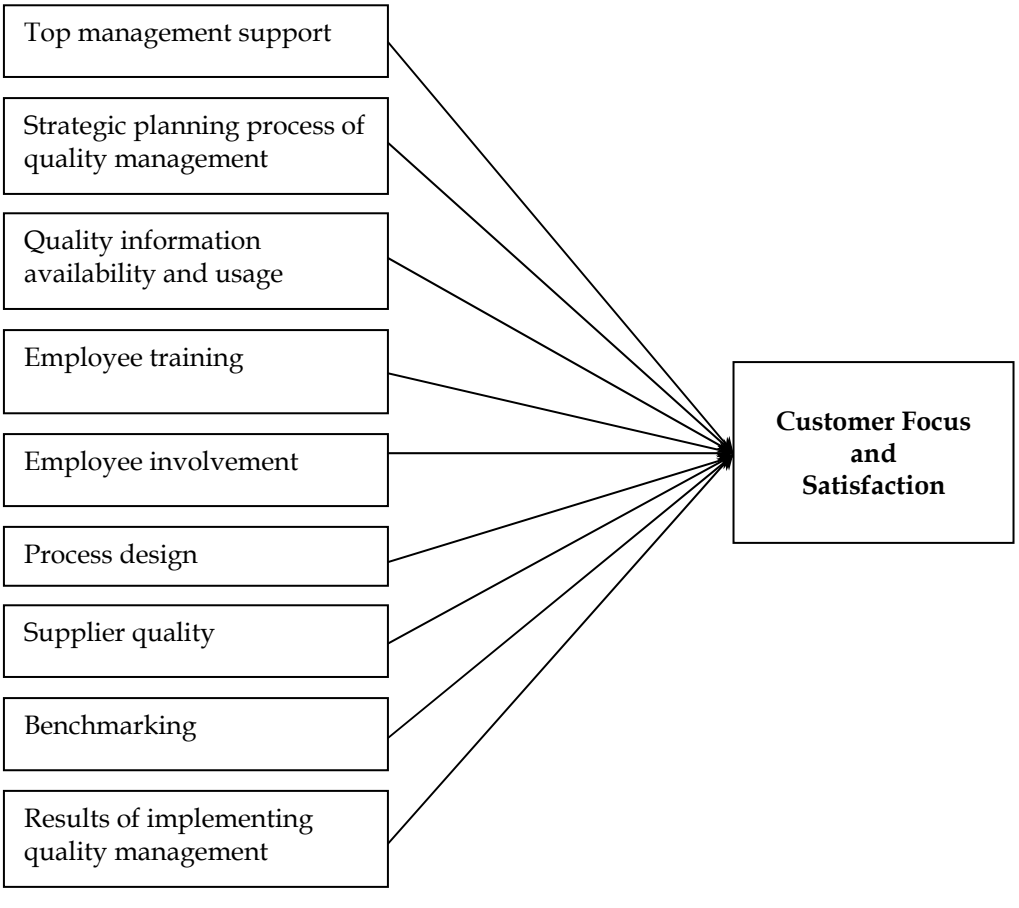


Figure 2: Theoretical Framework for Regression Analysis on Dependent Variable (Customer Focus and Satisfaction)

04 leading pharmaceutical companies having distribution set up throughout Pakistan provided their list of distributors. . The questionnaire was therefore send to 90 pharmaceutical distribution centers based throughout Pakistan. Total 51 usable responses received. The response rate, that is 56.7%, is satisfactory.

DATA ANALYSIS

The main method of purification of the scale in the development of a theoretical foundation research is difficult to trust on a confirmatory factor analysis (CFA) for one-dimensional scale, followed by scale

reliability and validity (Anderson and Gerbing, 1982). CFA with LISREL 8.8 was done for each of the 10 constructs in the questionnaire.
These 10 constructs are:

Results of Implementing Quality Management (RIQM)
Customer Focus and Satisfaction (CFS)
Process Design (PD)
Strategic Planning Process in Quality Management (SPPQM)
Quality Information Availability and Usage (QIAU)
Top Management Support (TMS)
Employee Training (ET)
Employee Involvement (EI)
Supplier Quality (SQ)
Bench Marking (BM)

During CFA using LISREL 8.8 2 items were deleted from 2 constrcuts. One item was deleted each from constructs EI and CFS. Therefore the number of items in 10 constructs reduced to 33 after CFA. According to Sila and Ebrahimpour (2005), experiential indication in CFA is usually measured on the basis of standards such as the comparative fit index (CFI), the root mean square error of approximation (RMSEA), the importance of parameter estimates, and the amount of explained variance. According to (Mahour, 2006) the goodness of fit index (GFI) is alternative measure of overall fit.

Comparative Fit Index (CFI): This index relates the suggested model with a null model supposing no relationship concerning the measures. A value above 0.90 designates a suitable fit CFI to data (Bentler, 1992). Table 2 shows that all values of the CFI above 0.99, suggesting the model fit very well.

Goodness of Fit Index (GFI): This index shows the comparative amount of the variance and covariance together clarified by the model. GFI values range from zero to one, with higher values indicates healthier fit. According to Chau, (1997) scores ranging from 0.8 to 0.89 are understood as a rational adjustment while the scores of 0.9 and higher signify good fit. All values of GFI in Table 2 range from 0.87 to 1.00, indicating the model fits very well.

Root Mean Square Error of Approximation (RMSEA): RMSEA is an index used to evaluate the residuals and apply the stinginess in the model. The value equivalent to or less than 0.08 for a passable model fit (Hu and Bentler, 1999). Table 2 shows that all the values are less than 0.08 indicates RMSEA model fit is sufficient.

Parameter estimates: Table 2 displays that all parameter estimations are statistically important saturations.

The amount of explained variance: The amounts of explained variance for all structures in Table 2, ranging from 0.09 to 0.97 give satisfactory squared factors loadings. Table 2 summaries the outcomes of CFA.

Table 2: Summary of Goodness of Fit Statistics for Confirmatory Factor Analysis (CFA)

Construct	No. of Items	Chi-Square Test	P-Value	Comparative Fit Index (CFI)	Goodness of Fit Index (GFI)	RMSEA	Factor Loading	R-Square
TMS	05	5.28	0.48154	1.00	0.87	0.034	1.15, 2.86, 1.22, 1.32, 1.27	0.55, 0.61, 0.88, 0.72, 0.68
SPPQM	02	5.50	0.59152	1.00	0.93	0.000	8.82, 12.67	0.73, 0.73
QIAU	04	1.05	0.51832	1.00	0.97	0.000	0.47, 0.46, 1.07, 0.62	0.26, 0.55, 0.80, 0.57
ET	03	0.42		1.00	0.98	0.000	0.73, 0.91, 0.60	0.68, 0.94, 0.42
EI	03	The model is saturated. The fit is perfect					0.29, 0.86, 0.91	0.23, 0.61, 0.76
PD	03	0.73	0.39129	1.00	0.97	0.000	0.92, 1.92, 0.28	0.41, 0.97, 0.094
SQ	02	5.50	0.48154	1.00	0.93	0.000	3.30, 3.81	0.27, 0.34
CFS	05	5.72	0.33420	0.99	0.90	0.054	0.68, 0.89, 0.89, 0.72, 0.82	0.43, 0.58, 0.60, 0.29, 0.64
BM	02	5.50	0.48154	1.00	0.93	0.000	8.71, 8.17	0.69, 0.69
RIQM	04	0.23	0.89310	1.00	1.00	0.000	0.69, 2.74,	0.28, 0.71,

							1.30, 2.09	0.72, 0.41

Once the unidimensionality of the constructs was established by CFA, the consistency and reliability of each construct and the full questionnaire was assessed by determining the Cronbach's coefficient alpha. Reliability coefficients of 0.70 or more are measured sufficient (Cronbach, 1951). The values of constructs PD and SQ are less than 0.70 (Table 3). These values (0.61 and 0.44 respectively) are still suitable, as Van de Ven and Ferry (1980) propose 0.35 as limit of the satisfactory value of Cronbach's alpha. The total value of Cronbach's alpha for the 33 items stayed in the questionnaire after CFA was 0.84. This value is satisfactory.

Table 3: Reliability Analysis

Construct	No. of Items	Cronbach's Alpha
TMS	05	0.88
SPPQM	02	0.79
QIAU	04	0.73
ET	03	0.78
EI	03	0.73
PD	03	0.61
SQ	02	0.44
CFS	05	0.72
BM	02	0.74
RIQM	04	0.74

According to Mentzer et al. (1999), the Cronbach's alpha is a worthless calculation with a two point scale or less, since its goal is to relate each item with the other elements of the scale as a group. Therefore, item total correlation (ITC) was assessed for constructs SPPQM, SQ, and BM as these constructs had only two items. All these values are above 0.70 mentions in table 4, so all item total correlation (ITC) values are satisfactory.

Table 4: Item to Total Correlations

Construct	Item to Total Correlation for Item 1	Item to Total Correlation for Item 2
SPPQM	0.922**	0.900**
SQ	0.796**	0.718**
BM	0.757**	0.900**

After evaluation of uni-dimensionality and reliability, content, convergent and discriminant validity of the questionnaire were assessed. The assessment of content validity is a course of judgment and is not open to numerical assessment *(Mahour, 2006)*. The questionnaire development in this research built on a thorough analysis of the literature followed by focus group discussion with representatives of the pharmaceutical distribution companies in Pakistan so the instrument used had strong content validity.

Convergent validity of each scale was tested with Bentler-Bonett Normed Fit Index (NFI) attained through CFA. According to Ahire et al., (1996) NFI identifies the degree to which diverse methods for the measurement of a construction has the same result. A value of 0.90 and above shows strong convergent validity (Hartwick and Barki, 1994). The Bentler-Bonett coefficient for all refined structures after CFA was greater than 0.90, indicating high convergent validity (Table 5).

Discriminant validity identifies the extent to which a concept and indicators differ from other concept and its indicators (Bagozzi et al. 1991). Indication of discriminant validity can be measured in different techniques (Mentzer et al., 1999). One way is the Cronbach's alpha of a concept similar to correlations with other variables in the model (Sila and Ebrahimpour, 2005). According to Ghiselli et al. (1981), if the value of alpha is adequately greater than the normal of the correlations with other variables, there is discriminant validity. The dissimilarity among the alpha-value of each concept, and the regular correlation of each concept, and other concepts was high enough that is 0.31 - 0.69, given that indication of discriminant validity shown in table 5.

Table 5: Convergent and Discriminant Validity

Construct	Convergent Validity (Bentler-Bonett NFI)	Discriminant Validity (Cronbach's Alpha – Average Correlation between other Constructs)
TMS	0.98	0.69
SPPQM	0.97	0.54
QIAU	0.99	0.54
ET	0.99	0.56
EI	Model saturated. Fit is perfect	0.50
PD	0.96	0.46
SQ	0.97	0.31
CFS	0.96	0.58

BM	0.97	0.56
RIQM	1.00	0.56

Once scale purification process was completed the next step was correlation analysis using SPSS. Correlation analysis was followed by regression and stepwise regression.

Table 6 shows the relationship between all variables. Kendall's tau coefficient was used as the Field *(2005)* endorses using a nonparametric data set. In theory, the higher the value of the correlation among two variables most related are these variables to each other. Table 6 shows that there are total 12 correlations. However, the dependent variable CFS has only two significant correlation (one with the construct PD (r = 0.399 **) and other with construct RIQM (r = 0.441 **).

Table 6: Correlation among all Variables

Construct		TMS	SPPQM	QIAU	ET	EI	PD	SQ	CFS	BM	RIQM
TMS	r	1.000	.483**	.230*	.238	.247	.077	.097	.045	.223	.048
	P		.000	.028	.053	.060	.503	.385	.674	.058	.660
	N	51	45	51	38	34	45	47	51	43	49
SPPQM	r		1.000	.228	.302*	.275	-.060	.564**	-009	.268*	-.041
	P			.052	.029	.065	.640	.000	.941	.039	.733
	N		45	45	33	29	41	43	45	39	44
QIAU	r			1.000	.552*	.169	.185	.050	.064	-.063	.180
	P				.000	.201	.115	.657	.555	.597	.099
	N			51	38	34	45	47	51	43	49
ET	r				1.000	.238	.169	.017	.102	.000	.338**
	P					.112	.201	.895	.424	1.000	.009
	N				38	27	36	35	39	32	36
EI	r					1.000	.289*	.184	.131	.338*	.201
	P						.043	.210	.327	.026	.142
	N					34	31	30	34	28	32
PD	r						1.000	.007	.399**	.016	.297*
	P							.956	.001	.901	.014
	N						45	43	45	37	44
SQ	r							1.000	.039	.179	-.070
	P								.742	.157	.549
	N							47	47	40	45
CFS	r								1.000	.083	.441**
	P									.500	.000
	N								51	43	49
BM	r									1.000	-.020
	P										.871
	N									43	41
RIQM	r										1.000
	P										
	N										50

* Correlation is significant at the 0.05 level (2-tailed)

** Correlation is significant at the 0.01 level (2-tailed)
After correlation analysis regression analysis was done.

REGRESSION OF DEPENDENT VARIABLE (CFS)

Tables 7–10 presents regression analysis done when CFS is dependent variable. All independent variables were entered in the regression model shown in Table 7.

Table 7: Variables Entered/Removed (b)

Model	Variables Entered	Variables Removed	Method
1)	RIQM, SQ, BM, ET, TMS, PD, EI, QIAU, SPPQM (a)	.	Enter

a) All requested variables entered.
b) Dependent Variable: CFS

Table 8: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1)	.595 (a)	.355	-.371	1.84074

a) Predictors: (Constant), RIQM, SQ, BM, ET, TMS, PD, EI, QIAU, SPPQM

Table 9: ANOVA (b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1)	Regression	14.893	9	1.655	0.488	.847 (a)
	Residual	27.107	8	3.388		
	Total	42.000	17			

a) Predictors: (Constant), RIQM, SQ, BM, ET, TMS, PD, EI, QIAU, SPPQM
b) Dependent Variable: CFS

Table 10: Coefficients (a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta	B	Std. Error
1)	(Constant)	16.747	5.713		2.931	.019
	TMS	-.209	.223	-.492	-.937	.376
	SPPQM	.083	.461	.119	.180	.862
	QIAU	.119	.344	.175	.344	.739
	ET	-.075	.285	-.138	-.264	.733
	EI	-.011	.246	-.019	-.043	.967
	PD	.655	.619	.519	1.057	.321
	SQ	-.048	.527	-.046	-.092	.929
	BM	-.150	.401	-.171	-.375	.717
	RIQM	.088	.224	.203	.394	.704

Table 8 shows that the regression model reports 35.5% of variability of CFS. Table 9 (ANOVA - analysis of variance) indicates that the model is not significant at $\alpha = 0.05$. Table 10 point out that none of the variable(s) is a statistically significant predictor of dependent variable (CFS). As none of the variable(s) emerged as a significant predictor of dependent variable by simple regression, the next step was the stepwise regression. Stepwise regression makes it possible to identify predictors that are considered useful at an early stage but lose their usefulness when additional predictors are brought into the model (Mahour, 2006).

STEPWISE REGRESSION OF DEPENDENT VARIABLE (CFS)

Tables 11–14 display the outcomes of a stepwise regression analysis of dependent variable (CFS). PD appeared as the single significant variable in table 11.

Table 11: Variables Entered/Removed (a)

Model	Variables Entered	Variables Removed	Method
1)	PD	.	Stepwise (Criteria: Probability –of-F-to-enter <= .050, Probability-of-F-to-remove >= .100).

a) Dependent Variable: RIQM

Table 12: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1)	.745 (a)	.556	.456	1.61596

a) Predictors: (Constant), BM

Table 13: ANOVA (b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1)	Regression	143.710	1	143.710	55.033	.000 (a)
	Residual	114.899	44	2.611		
	Total	258.609	45			

a) Predictors: (Constant), BM
b) Dependent Variable: RIQM

Table 14: Coefficients (a)

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		

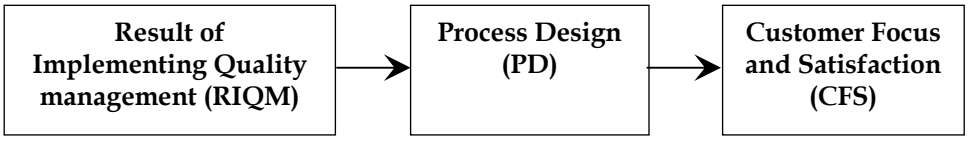
a) Dependent Variable: RIQM

Table 12 indicates that 55.6% of variability of CFS is explained by this regression model. Analysis of variance (ANOVA) indicates that the model is significant at $\alpha = 0.05$ (Table 19). Table 14 also point out that PD is significant predictor of CFS.

The first regression model (Tables 7-10) in regression analysis on CFS as dependent variable revealed that none of the independent variable(s) is a statistically significant predictor of the dependent variable (CFS). In stepwise regression (Tables 11-14) PD emerged as the statistically significant predictor that explained more than 55 % of the variability of dependent variable. Here it is important question why RIQM has not emerged as the significant predictor variable, because in theory stepwise regression selects the first variable as the variable that has the highest

correlation with the dependent variable (Mahour 2006). Variable RIQM has the highest correlation with dependent variable CFS (Table 11) but this variable has not emerged in the stepwise regression model. Since RIQM has significant correlation with PD also it may be concluded that most of the variability explained by RIQM has been explained by PD. Therefore it may be concluded that two variables have a significant role in the development of a theoretical framework for CFS. These variables are PD and RIQM. PD has direct role as it emerged as a single significant variable in the stepwise regression. RIQM has indirect role as it is significantly correlated with both CFS and PD and the variability explained by RIQM has already been explained by PD in regression analysis. Figure 5.1 shows the framework developed for dependent variable (CFS) on the basis of correlation and regression analysis.

Figure 4: Framework for Customer Focus and Satisfaction (CFS)



DISCUSSION

Correlation analysis among all variables (Table 6) indicates that variable CFS is significantly correlated with only two variables i.e. RIQM and PD. However in stepwise regression analysis only PD emerged as significant predictor of CFS. Variable RIQM has the highest correlation with dependent variable CFS but this variable has not emerged in the stepwise regression model. Since RIQM has significant correlation with PD also it may be concluded that most of the variability explained by RIQM has been explained by PD. Therefore it is concluded that two variables have a significant role in the development of a theoretical framework for CFS. These variables are PD and RIQM. PD has direct role as it emerged as a single significant variable in the stepwise regression. RIQM has indirect role as it is significantly correlated with both CFS and PD and the variability explained by RIQM has already been explained by PD in regression analysis. Therefore it may be suggested that TQM implementation only relates indirectly to the customer satisfaction in pharmaceutical distribution companies in Pakistan. However this is not enough reason to conclude that TQM implementation has an indirect

effect on dependent variable (CFS) because RIQM did not emerge as a significant factor in regression or stepwise regression analysis.
This research has therefore contributed in the existing literature in multiple ways. Direct relationship of TQM implementation on customer satisfaction was tested which could not be found. There have been fewer studies which have studied TQM and SCM together. This study tried to study TQM implementation in pharmaceutical distribution company and may be used as template for other sector SCM. This study has also tried to reduce the existing lack of pharmaceutical supply chain studies in developing countries.

The findings of this research identify an interesting area for future research in the pharmaceutical distribution sector. Pharmaceutical distribution sector is highly regulated sector so it may be hypothesized that the concept of Product Realization Chain strongly exists in this sector. Nissen, (1996) argue that PD broadly depends on stakeholders that involve in the process and their activities. Therefore pharmaceutical distribution companies believe that their customers are more concerned about process design as their first priority is to meet regulatory requirements. The concept of Quality Function Deployment (QFD) is widely accepted as a tool through which voice of the customer is incorporated into the product through process design as Process Design (PD) is the understanding of the characteristics of the operational processes that are necessary in order to create product/service" (Pisano, 1997). Pharmaceutical distribution companies in Pakistan therefore should also extensively use the concept of Quality Function Deployment (QFD) in their PD activities as PD as per requirements of the customer may be in better position to satisfy the customers. At present none of the QFD academic research has focused on pharmaceutical distribution companies so this may be an interesting area of research.

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