

Organizational performance with disruptive factors and inventory control as a mediator in public healthcare of Punjab, Pakistan

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ABSTRACT

The organizational performance at Punjab healthcare is crucial and often faces stock-outs of critical medicines and equipment at emergency department of different hospitals, which increased the mortality rate. Therefore, the study determined the effect of disruptive factors and inventory control as a mediator on organizational performance. Quantitative method with survey questionnaires on a 200-sample size through cluster sampling was used. SPSS and AMOS were used to examine Exploratory Factor Analysis, Confirmatory Factor Analysis, and Structural Equation Modeling. The results found full mediation with a significant positive effect between study variables. Further, the study indicated that strict compliance of standardized operating procedures, professionally well-equipped staff, stock availability, and accurate inventories could reduce costs with improved service quality. This study is useful for the public healthcare facilities, ministries managing inventories and body of knowledge. Finally, the back-log inventories at public sector organizations need to be researched in future.

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1. Introduction

According to Hashmi et al. (2020), healthcare performance is a crucial entity as it involves the patients, clinicians, broader public, and the government. Further, the performance at healthcare significantly varies from conventional services (Shabbir et al., 2016). At the same time, public healthcare facilities are less autonomous in managerial matters to act for unconditional conformity on the stake of public health (Hashmi et al., 2020). Besides, public healthcare facilities usually are criticized and alleged for poor accountability, misuse of resources, and maladministration (Silva and Ferreira, 2010). Because of the vital role of healthcare, in budget 2015-16, the Health Department allocated 168 billion Pakistani Rupees for primary and secondary healthcare (Rashid et al., 2019). Despite having a colossal amount, the increased mortality rate upshot. Only in December 2015, the Punjab Institute of Cardiology found 112 deaths and 46,000 patients at high risks due to stocked-out and expired batches of curative medicines. The Department of Health went through hasty buying cost 5.6 billion Pakistani Rupees with 56 million for compensation of dead victims. The infant mortality was 89 per thousand, which were 78 per thousand in 2008. The maternal mortality rate was 227 out of 276 per 100,000 from the whole country. Further, the ranking of at 149th position in world healthcare shows the worseness (Rashid and Amirah, 2017). Since the healthcare facilities involve lifesaving products, therefore, public healthcare of Punjab necessitate such empirical investigation.

1.1. Research question and objectives

The research questions would broadly discover the strategic importance of specific disruptive factors and role of inventory control in the performance of healthcare facilities of Punjab, Pakistan; whereas in detail, following objectives will address the problem statement:

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1. To determine the significant positive effect of disruptive factors (bureaucratic procedures and staff skills) on inventory control,
2. To determine the significant positive effect of disruptive factors (bureaucratic procedures and staff skills) on organizational performance,
3. To determine the significant positive effect of inventory control on organizational performance,
4. To determine the mediating effect of inventory control in the relationship between disruptive factors (bureaucratic procedures and staff skills) and organizational performance.

2. Relevant Theories

Theories have imperative importance to answer the research questions in quantitative research (Creswell, 2014; Afthanorhan, 2013). Therefore, Control Theory and Resource-Based View Theory were used to find the effect of variables.

2.1. Control Theory

Primarily, control theory evaluates self-regulating systems, either humanistic or mechanistic or both. The central idea was for many decades. However, as a distinct body of thought, Wiener established the control theory in (1948). According to Carver and Scheier (1982), control theory is diversified and contributes to several fields, including healthcare, economics, applied mathematics, engineering, and management. Further, Axsater (1985) expressed that control theory attributes and encompasses an impact on relevant areas of inventory control by designing and utilizing the inventory control systems. Further, this theory demonstrates the importance of feedback and its dynamical effects, which are essential for inventory control and production. According to Axsater (1985), this theory has three areas, which are classified to contribute to inventory control, namely, non-linear deterministic systems, linear stochastic systems, and linear deterministic systems. For enhanced and efficient operations of any organization, a systematic substantial internal control is a crucial part, which ensures reliable, long term managerial and financial reporting with target achievement. Such systems also assure the compliance of procedures, internal rules, plans, policies, regulations, laws, and minimize the damages with reduced risks to the organizational reputation (Kiilu, 2016). According to Wei (2012) application of control theory in inventory control could be a leading endeavour.

2.2. Resource-Based View Theory

RBV theory was emerged through "Firm Resources and Sustained Competitive Advantage," written by Barney (1991). It was widely cited to develop RBV theory based on Wernerfelt's (1984) "Resource Position Barriers" by explaining the approaches to sustain a unique position in viable situations (Hoopes et al., 2003). Besides, the RBV theory has two main conjectures. The first is, within an industry, the organizational resources may differ, and the second is, across organizations, those resources might not be entirely mobile. The main emphasis of RBV theory is on the resources and capabilities that could involve efficient procedures and processes, contracts, capital, machinery, technology, skills, abilities, employee knowledge, and brand names (Wernerfelt, 1984). According to Shibin et al. (2017), RBV theory overcomes the challenges in inventory control by emerging the significant resources, which contributes indirectly or directly to achieve better organizational performance through organizational resources. RBV theory could also be implied individually to know the procedures, processes, competencies, capabilities, and skills to remove deficiencies.

3. Overview of the proposed research model

The field of supply chain management is increasingly applying theories (Hsu et al., 2009). Therefore, this study used control theory and RBV theory to develop a research model that is shown in Fig. 1, while demonstrating two independent variables, one dependent variable, and one mediator to examine the mediation effect between the relationship of the independent and dependent variables. The developed model has seven hypotheses, five direct hypotheses (H1a, H1b, H2a, H2b, and H3) and two are related to mediation (H4a, H4b).

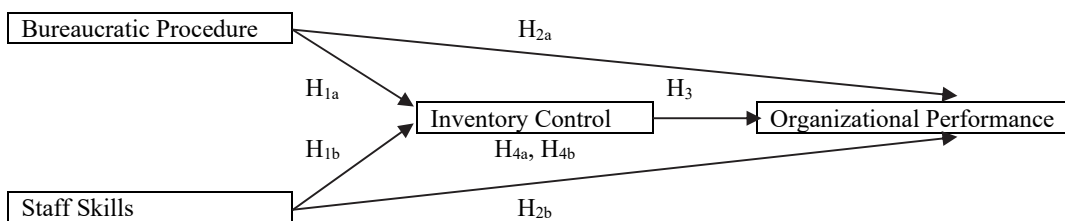


Fig. 1. Proposed research model

3.1. Research hypotheses

Based on the proposed research model, the research hypotheses were developed as below:

1. H1a: Bureaucratic procedures have a significant positive effect on inventory control.
H1b: Staff skills have a significant positive effect on inventory control.
2. H2a: Bureaucratic procedures have a significant positive effect on organizational performance.
H2b: Staff skills have a significant positive effect on organizational performance.
3. H3: Inventory control has a significant positive effect on organizational performance.
4. H4a: Inventory control mediates the relationship between bureaucratic procedures and organizational performance.
H4b: Inventory control mediates the relationship between staff skills and organizational performance.

4. Data analysis and findings

The study is cross-sectional and followed the positivism research philosophy. Positivism advocates for quantitative research (Creswell, 2014). Further, the survey method through structured questionnaire on an interval scale was performed to validate the research hypothesis (Awang, 2015). This research performed Exploratory Factor Analysis (EFA) in IBM SPSS version 22.0, and Confirmatory Factor Analysis (CFA) and Structural Equation Modeling (SEM) in IBM SPSS AMOS version 22.0. Besides, EFA and CFA framework is a scale validation procedure but on different sample sizes (Worthington and Whittaker, 2006). Therefore, a sample size of 100 was used for EFA. However, a sample size of 200 was used for CFA through multistage cluster sampling method. 2899 total healthcare facilities of Punjab were divided into nine divisions (clusters) and from nine divisions, one district from each division constituted a sampling frame of 343 healthcare facilities. Later, 200 respondents were selected randomly to generalize the population characteristics (Hair et al., 2010). Prior to EFA, CFA, and SEM procedures, the study examined the demographic attributes of respondents and performed descriptive analysis to check the pragmatic effects.

4.1. Exploratory factor analysis (EFA)

Varimax (orthogonal rotation) with principal axis factoring on 36 items was used. Orthogonal rotation states that there is no correlation between the resulted components or factors (Tabachnick and Fidell, 2013).

Table 1

Summarized results of rotated factor matrix

Items	BP Factors		SS Factors		IC Factors		OP Factors	
	1	2	1	2	1	2	1	2
BP2	0.904							
BP1	0.807							
BP5	0.798							
BP3	0.702							
BP4	0.474							
BP8		0.810						
BP9		0.746						
BP6		0.738						
BP7		0.703						
SS1			0.825					
SS4			0.800					
SS2			0.743					
SS3			0.659					
SS8				0.764				
SS5				0.753				
SS6				0.705				
SS7				0.331				
IC2					0.825			
IC1					0.808			
IC4					0.791			
IC3					0.655			
IC7						0.778		
IC6						0.727		
IC5						0.713		
IC8						0.678		
OP9							0.949	
OP8							0.887	
OP10							0.816	
OP11							0.759	
OP7							0.470	
OP6								0.846
OP3								0.834
OP4								0.750
OP2								0.746
OP1								0.698
OP5								0.491

Notes: Extraction method: principal axis factoring; factor loading in bold are < 0.60

Table 1 summarized the results of the rotated factor matrix for each variable, where four items with factor loadings < 0.60 were removed one by one with re-running the analysis for that specific variable. Resultantly, 32 items were retained for further analysis with no cross-loadings > 75% on any other item, and the eigenvalues of one were opted to extract the number of factors (Hair et al.,

2010; Field, 2013). The statistical assumptions and EFA results are as follows:

Kaiser-Meyer-Olkin (KMO) values found acceptable > 0.60 , with 0.851 for bureaucratic procedures, 0.842 for staff skills, 0.852 for inventory control, and 0.809 for organizational performance (Rashid et al., 2019). Whereas, Bartlett's test of sphericity was significant with $p < 0.001$ (Field, 2013). Communalities value for each item was > 0.2 except one item in staff skills (0.147), which was removed with re-running the analysis because the communalities value of < 0.2 signifies additional factors (Child, 2006). Total variance explained was 62 percent for the first two factors of bureaucratic procedures, 62 percent for first two factors of staff skills, 60 percent for first two factors of inventory control, and 61 percent for first two factors of organizational performance, which are > 50 percent. The variance for the first factor of each construct was < 50 percent (Hashimi et al., 2020).

4.2. Demographic attributes of respondents

The demographic breakdown of respondents expressed in Table 2, explaining that the male and female contribution was 91.5 percent ($n=183$) and 8.5 percent ($n=17$), respectively. The contribution of different age groups for 20-30 years was 70.5 percent ($n=141$), 31-40 years 25.5 percent ($n=51$), and 04 percent ($n=8$) for 41-50. Furthermore, 77 percent ($n=154$) and 23 percent ($n=46$) respondents were single and married, respectively. The education of respondents was with 8.5 percent ($n=17$) of master degree holders, 47 percent ($n=94$) of bachelors, 26 percent ($n=52$) of diploma, 11.5 percent ($n=23$) high school, and 07 percent ($n=14$) of others. Lastly, the 06 percent ($n=12$) respondents were with experience less than 02 year, 43.5 percent ($n=87$) were having experience 02-05 years, 26.5 percent ($n=53$) were from the group of 06-10 years, 16.5 percent ($n=33$) were from 11-15 years, and 7.5 percent ($n=15$) were from 15+ years of service.

Table 2

Demographic breakdown of respondents

Demographic Profile	Category	Frequency ($n = 200$)	%
Gender	Male	183	91.5
	Female	17	8.5
Age (Years)	20 – 30	141	70.5
	31 – 40	51	25.5
	41 – 50	8	4
Marital Status	Single	154	77
	Married	46	23
Education	Masters	17	8.5
	Bachelors	94	47
	Diploma	52	26
	High School	23	11.5
	Others	14	7
Years of Service	Less than 2 years	12	6
	2 – 5 Years	87	43.5
	6 – 10 Years	53	26.5
	11 – 15 Years	33	16.5
	15+ Years	15	7.5

Notes: n = Number of respondents

4.3. Descriptive analysis

The descriptive analysis evaluated the mean and standard deviation for each item on a point-five Likert scale (1 strongly disagree – 5 strongly agree). The results in Table 3 suggest that the items and the variables comprised good enough scores. The mean values for the variables, namely, BP, SS, IC, and OP have $M=3.98$, $SD=0.753$; $M=3.95$, $SD=0.797$; $M=4.02$, $SD=0.760$; and $M=4.01$, $SD=0.849$, respectively. The scores are representing that the maximum number of respondents are agreed on the important role of disruptive factors and inventory control in organizational performance (Rashid, 2016; Yusof et al., 2017).

Table 3

Descriptive analysis results

Construct	Dimension	Items	M for item	M for variable	SD for variable
BP	BRR	BRR1: adequate standing operating procedures.	3.91	3.98	.753
		BRR2: long bureaucratic related purchase difficulties.	4.02		
		BRR3: storekeepers have full independence.	3.92		
		BRT4: long bureaucratic practice affects activities.	3.96		
	BRT	BRT5: organization is planning with maximum red tapes.	3.95		
		BRT6: too much paperwork during feedback.	4.02		
		BRT7: need thorough improvement with the least paperwork.	4.01		
		BRT8: over-reliance on paperwork.	4.07		
SS	SP	SP1: storekeepers help to diagnose problems.	3.96	3.95	.797
		SP2: storekeepers have the required competence.	3.89		
		SP3: staff achieves the purpose of being held.	3.91		
		SP4: being affected due to incompetent staff.	3.96		
ST	ST5: staff training is needed.	4.01			
	ST6: organization intends to develop skills.	3.98			
	ST7: educating workers.	3.47			

Table 3
Descriptive analysis results (Continued)

Construct	Dimension	Items	M for item	M for variable	SD for variable
IC	ICS	ICS1: often face stock-out of crucial items.	4.03	4.02	.760
		ICS2: always have buffer stock.	4.03		
		ICS3: determining inventory order size is crucial.	4.02		
		ICS4: most of the deliveries are delayed.	4.00		
	ICA	ICA5: experiencing discrepancies in stock balance.	4.07		
		ICA6: inaccurate inventories are being handled.	3.98		
		ICA7: physical inventory varies from the system stock.	4.06		
		ICA8: ability to improve your inventory accuracy.	4.00		
OP	OPC	OPC1: frequently goes with hasty buying.	4.08	4.01	.849
		OPC2: expired, obsolescence, and damaged items in stores.	4.03		
		OPC3: determine optimization.	4.08		
		OPC4: cost at the expense of stocked-out affects.	4.09		
	OPSQ	OPS5: bed occupancy rate (BOR) is high.	3.36		
		OPS6: X-rays and lab equipment are sufficient.	3.95		
		OPS7: stock handlers are an essential for quality deliverance.	3.93		
		OPS8: effective mechanisms help the clients efficiently.	3.96		
		OPS9: overall service quality is being achieved.	3.95		

Notes: M, Mean; SD, standard deviation; BP, bureaucratic procedures; BRR, rigid rules; BRT, red tapes; SS, staff skills; SP, professional qualification; ST, staff training; IC, inventory control; ICS, inventory stocks; ICA, inventory accuracy; OP, organizational performance; OPC, cost; OPSQ, service quality

4.4. Confirmatory factor analysis (CFA)

A second-order measurement model validated four main latent constructs and eight sub-constructs. The pooled CFA was preformed that has no constraint in model identification if any construct contains less than four items (Awang, 2015). The validation procedure was done by examining unidimensionality, validity, and reliability.

4.4.1. Unidimensionality

Unidimensionality is a construct explaining a set of indicator variables (Hair et al., 2010). Figure 2 showing Maximum Likelihood Estimator (MLE) results, where the item OPS5 and ST7 (factor loading < 0.60) were deleted one by one, started from lowest loading by re-running the model to achieve unidimensionality (Hair et al., 2010; Awang, 2015). After the removal of two items, the loadings ranged 0.769 - 0.951 without any redundant item in AMOS output. Besides, in contrast to Figure 2, the Table 5 corresponding the results for each construct and their items.

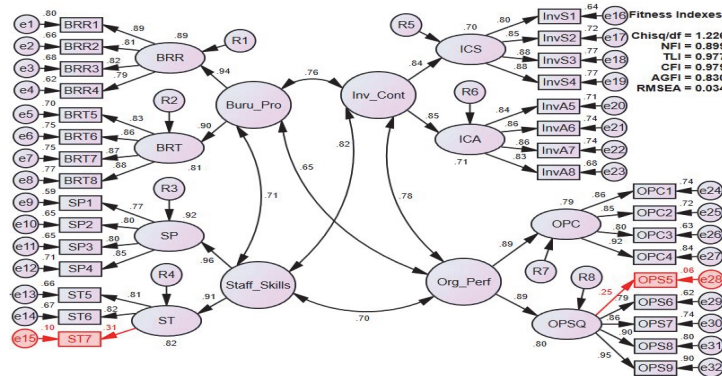


Fig. 2. Measurement model before modification

4.4.2. Validity

The validity of a measurement model should imperatively be achieved through construct validity, convergent validity, and discriminant validity (Henseler, 2012).

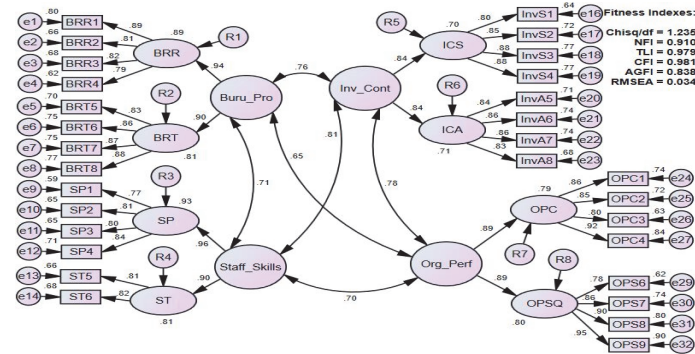
4.4.2.1. Construct validity and reliability

This validity test refers to the measurement of accuracy and the extent that the latent construct represented by observed items (Hashmi et al., 2020). Construct validity was examined through fitness indices (parsimonious fit, incremental fit, and absolute fit). For which, at least one category from each fitness index was selected (Hair et al., 2010). Table 4 comprised the frequently cited indices with relatively recommended values. Further, Figure 3 is showing the results of goodness-of-fit indices, where Parsimonious fit consisted ChiSq/df= 1.235 (1.00-5.00); incremental fit consisted NFI= 0.910 (> 0.90), TLI= 0.979 (> 0.90), CFI= 0.981 (> 0.90), and AGFI= 0.838 (> 0.80); likewise, absolute fit category consisted RMSEA= 0.034 (< 0.08). All the fitness indices have been achieved for each category. Further, Cronbach alpha and composite reliability (CR) evaluated the reliability, and the results in Table 5 expressed the Cronbach alpha 0.903 - 0.941 (> 0.70), the CR 0.829 - 0.929 (> 0.70), and the factor loadings are at excellent (> 0.70) (Hair et al., 2010). The high factor loadings show the associated indicators have much in common that is taken into account by the construct (Hair et al., 2010). According to Hair et al. (2011), the factor loadings between 0.40 – 0.70 could be deleted only if the aim is to achieve Average Variance Extracted (AVE) or CR. Fig. 3 and Table 5 are suggesting that construct validity and reliability have adequately been achieved and believed as sufficiently error-free.

Table 4
Goodness of fit indices for measurement model

Category	Index Name	Level	Cited
Parsimonious fit	χ^2/df	1.00 – 5.00	Kline (2010)
		≤ 3.00	Bagozzi and Yi (1988)
	PNFI	> 0.05	Bentler and Bonnet (1980)
Incremental fit	TLI	≥ 0.90	Bagozzi and Yi (1988)
	IFI	≥ 0.90	Bollen (1990)
	NFI	≥ 0.80	Bentler and Bonnet (1980)
	CFI	≥ 0.90	Bagozzi and Yi (1988), Hair et al. (2010)
	AGFI	≥ 0.80	Jöreskog and Sörbom (1993)
Absolute fit	$\chi^2 p$ -Value	> 0.05	Awang (2015)
	GFI	≥ 0.80	Awang (2015), Hashmi et al. (2020)
	RMSEA	≤ 0.08	Steiger (1990), Hair et al. (2010)

Source: Literature



4.4.2.2. Convergent validity

Convergent validity evaluates the relationship between the items and the latent construct to ensure that they correspond to each other (Hair et al., 2013).

Table 5
Standardized Loading, Cronbach's α , CR, and AVE for Full Model

Construct	Sub-Construct and Items	Cronbach Alpha (> 0.7)	Std β (> 0.7)	CR (> 0.7)	AVE (≥ 0.5)
Bureaucratic Procedures (BP)	BRR	0.936	0.943	0.918	0.848
	BRR1		0.893		
	BRR2		0.812		
	BRR3		0.822		
	BRT	0.898	0.898		
	BRT5		0.834		
	BRT6		0.864		
	BRT7		0.868		
Staff Skills (SS)	SPQ	0.903	0.962	0.929	0.868
	SP1		0.769		
	SP2		0.805		
	SP3		0.805		
	SP4		0.844		
	ST		0.900		
ST4	0.815				
Inventory Control (IC)	ICS	0.923	0.839	0.829	0.708
	InvS1		0.802		
	InvS2		0.846		
	InvS3		0.880		
	ICA	0.844	0.844		
	InvA5		0.845		
	InvA6		0.859		
	InvA7		0.858		
Organizational Performance (OP)	OPC	0.941	0.890	0.885	0.794
	OPC1		0.859		
	OPC2		0.851		
	OPC3		0.796		
	OPSQ	0.892	0.892		
	OPS6		0.785		
	OPS7		0.862		
	OPS8		0.896		
	OPS9		0.951		

Notes: AVE for the second-order model = averaging the squared multiple correlations for the first-order indicators; BRR: bureaucratic rigid rules; BRT: bureaucratic red tapes; SPQ: staff professional qualification; ST: staff training; ICS: inventory stocks; ICA: inventory accuracy; OPC: organizational performance cost; OPSQ: service quality
 Source: SPSS and AMOS output

For convergent validity, the AVE was measured that ranged 0.708 – 0.868 (> 0.50), which adequately fulfilled the test assumptions (Hashmi et al., 2020). The results are presented in Table 5.

4.4.2.3. Discriminant validity

Discriminant validity deals with the latent constructs to examine differentiate between other latent constructs and the latent construct (Hair et al., 2010). Table 6 expressing the results, where the square root of AVE of each construct in diagonal was compared with its squared correlation (Henseler, 2012). The values in the columns and rows are lower than the diagonal values, and the correlation is < 0.85 (Awang, 2015). Hence, the multicollinearity problem did not exist, and the model has achieved the discriminant validity.

Table 6
Summary of discriminant validity

Construct	AVE	OP	BP	IC	SS
OP	0.794	0.891			
BP	0.848	0.652	0.921		
IC	0.708	0.780	0.757	0.842	
SS	0.868	0.695	0.709	0.811	0.932

Source: AMOS output

4.4.3. Normality test

Normality test was measured through skewness and kurtosis for each item, and found between -1.0 and +1.0 (Awang, 2015). Since the data is normally distributed, there is no need to examine the Mahalanobis distance, which is the distance of remaining cases from the centroid (Tabachnick and Fidell, 2013).

4.5. Structural equation modeling (SEM)

4.5.1. Hypothesis testing (direct hypotheses: H1a, H1b, H2a, H2b, and H3)

Five direct hypotheses were tested through SEM and the results in Table 7 expressing that BP significantly predicts IC and OP, and SS significantly predicts IC and OP. Likewise, IC significantly predicts OP. Hence, hypotheses (H1a, H1b, H2a, H2b, and H3) are supported with Critical Ratio (CR) greater than 1.96 (Hair et al., 2010). Additionally, the results are evident that IC (Std β = 0.779) has more influence on OP than of BP and SS.

Table 7
Structural path analysis results (direct hypothesis)

Hypothesis	Path	Std β	S.E	C.R	Results
H1a	IC \leftarrow BP	0.362***	0.102	3.465	Supported
H1b	IC \leftarrow SS	0.557***	0.096	4.925	Supported
H2a	OP \leftarrow BP	0.324***	0.127	3.080	Supported
H2b	OP \leftarrow SS	0.463***	0.113	4.187	Supported
H3	OP \leftarrow IC	0.779**	0.130	7.506	Supported

Notes: ***, $p < .001$; **, $p < .05$

Source: AMOS output

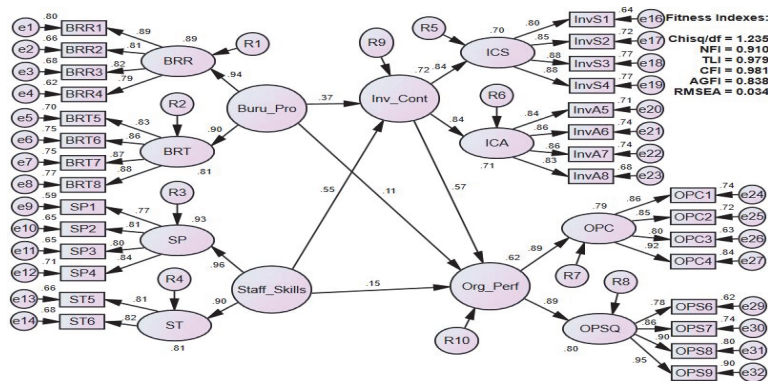


Fig. 4. Structural Equation Modeling (SEM)

4.5.2. Mediation assessment (hypotheses: H4a and H4b)

For these hypotheses, the direct effects (path c) were measured before indirect effects (path c') (Awang, 2015). The results in Table 8 indicating the standardized estimates (Std β) are positive and significantly predicting direct effects (path c, path a, and path b). This significance is necessarily required to continue with testing the mediation effect. Meanwhile, the indirect effect (path c'), whom Std β has been abridged (from 0.324 to 0.111 for H4a, and from 0.463 to 0.153 for H4b) after adding the mediator (IC) in the structural model, proving that the mediation occurs (Field, 2013). Besides, the path c' is no longer significant, indicating full

mediation (Hashmi et al., 2020). Hence, the mediation of "IC" is proven in the relationship between BP and OP, and hypothesis H4 is supported.

Table 8

The mediation assessment (hypothesis H4)

Hypothesis	Path	Relationships	Std β	S.E	C.R
H4a	C	OP←BP	0.324***	0.127	3.080
	A	IC←BP	0.366***	0.102	3.515
	b	OP←IC	0.571**	0.228	3.145
	c'	OP←BP	0.111 (ns)	0.142	0.959
H4b	c	OP←SS	0.463***	0.113	4.187
	a	IC←SS	0.552***	0.094	4.930
	b	OP←IC	0.571**	0.228	3.145
	c'	OP←SS	0.153 (ns)	0.150	1.077

Notes: *** $p < 0.001$; ** $p < 0.05$; (ns), Not significant

Source: AMOS output

4.5.2.1. Bootstrapping results for hypotheses H4a and H4b

According to Awang (2015), bootstrapping suggested by Preacher and Hayes (2008) is another widely used method to test the mediation. Table 9 demonstrating the bootstrapping results of direct effect and indirect effect, where the hypotheses H4a and H4b (indirect effect Std $\beta = 0.209$; Std $\beta = 0.315$, respectively) are statistically significant and H4a: 95 percent boot CI (LL = 0.035, UL = 0.805) and H4b: 95 percent boot CI (LL = 0.069, UL = 1.066) does not straddle a 0 in between. Hence, the mediation of "IC" occurs and is supporting the study hypotheses. Besides the insignificant direct effect suggesting full mediation in the relationships.

Table 9

Bootstrapping results

Hypothesis	Path	Std β (DE)	Std β (IE)	LL	UL	Decision
H4a	BP→IC→OP	0.111 (ns)	0.209**	0.035	0.805	Supported
H4b	SS→IC→OP	0.153 (ns)	0.315**	0.069	1.066	

Notes: DE, Direct Effect; IE, Indirect Effect; ns, Not significant; ** $p < 0.05$

Source: AMOS output

4.6. Coefficient of determination (R^2)

Fig. 4 represented a substantial value (0.62) of the coefficient of determination (R^2) (Cohen, 1988). In other words, 62 percent of organizational performance could be predicted utilizing bureaucratic procedures, staff skills, and inventory control in the model. Likewise, 72 percent of inventory control could be predicted utilizing bureaucratic procedures and staff skills, which is also substantial (Chin, 1998). According to various authors, the recommended substantial R^2 values are; ≥ 0.10 (Falk and Miller, 1992), ≥ 0.26 (Cohen, 1988), ≥ 0.65 (Chin, 1998), and ≥ 0.75 (Hair et al., 2010).

4.7. Effect size (f^2)

According to Gefen and Rigdon (2011), effect size (f^2) examines the impact of the latent independent constructs on a latent dependent construct. The effect size could be determined by omitting specific exogenous constructs from the model and estimating the path model twice ($f^2 = (R^2_{\text{included}} - R^2_{\text{excluded}}) / (1 - R^2_{\text{included}})$) (Hair et al. 2010). The results found moderate effect size of IC on OP (0.24). According to Cohen (1988), the effect size is small if ≥ 0.02 , medium ≥ 0.15 , and large ≥ 0.35 .

5. Discussion

A second order model was integrated and validated to address the study hypotheses. The findings found that the data fitted well into the proposed model containing three main constructs. The discussion is explicitly based on the study objectives as discussed below:

Objective 1: This objective was achieved through testing the hypotheses (H1a and H1b). The analysis output found that bureaucratic procedures have a statistically significant and positive effect on inventory control. It shows that the increased level of bureaucratic procedures will increase the effectiveness of inventory control. The findings are consistent with the findings of Walker and Brewer (2008), and inconsistent with Ondari and Muturi (2016). Likewise, the findings for hypothesis H1b found a statistically significant and positive effect, which means that the increased level of staff skills will increase the level of inventory control and are proportionate to each other. The findings are consistent with the findings of Hsu et al. (2009).

Objective 2: The findings for hypotheses (H2a and H2b) found a significant and positive effect, indicating that the bureaucratic procedures are needed rather than the flexible and un-standardized procedures at public healthcare facilities. These findings are inconsistent with the findings of Meier et al. (2000), while, supported by Boyne and Meier (2013). Likewise, staff skills have a significant and positive effect on organizational performance. The findings are similar to the findings of Ng'ang' a (2013).

Objective 3: For this objective, the SEM tested the hypothesis (H3) and expressed that inventory control have a significant positive effect by that the increased level of inventory control will increase the level of organizational performance. The findings are similar

to the findings of Hashmi et al. (2020).

Objective 4: This objective was achieved through testing the hypotheses (H4a and H4b). The results found that inventory control significantly mediates the relationship of hypotheses. Further, the mediation type was full mediation. Previous findings of Rehman et al. (2019) consolidated the findings of this study.

6. Contribution and implication of research

The role of government hospitals is crucial for public health. These hospitals are affected the most and facing vulnerability due to the maladministration of inventories in functions of pharmacy and laboratory. Because of this, the Department of Health was requiring such research and the theoretical and organizational contributions of this research are given below comprehensively.

6.1. Theoretical contribution

This study successfully integrated and validated a second-order model through SEM. The study contributed to the body of Control theory, RBV theory, and to the literature of tested model. Besides, the theoretical contribution is the mediation of inventory control in the relationship between bureaucratic procedures, staff skills, and organizational performance. This study also contributed to the existing database of knowledge. In previous researches, warehousing, logistics, just in time, vendor managed inventory, and supply chain practices are the variables discussed the most rather the bureaucratic procedures and staff skills with the conjunction of inventory control and organizational performance.

6.2. Organizational contribution

The role of inventory control in Pakistan is still to adopt at vast. Therefore, the findings are beneficial to the government body, departments managing mega-structured inventories, the pharmaceutical industry, and specifically the public and private healthcare facilities. Further, this type of study was indispensable to be emphasized as it is directly linked with two main elements of business studies, namely, inventory control, and organizational performance. Additionally, the dimensions of this study, namely, rigid rules and policies, red tapes, professional qualification, staff training, inventory stocks, inventory accuracy, cost, and service quality are perceived as relevant when linked to the public sector. Hence, the study can be a guideline for the public sector to work on their grey areas, which is a continuous practice.

7. Conclusion, limitations, and recommendations

This study considered only four variables, which could also be discussed by using several other variables. This study relied on perceptions rather than absolute values. The study also faced the constraints, like the study scope was geographically limited only to the Punjab province, cost, time, restricted and denied access to some information, inaccurate and inadequate record-keeping at healthcare facilities. The findings recommend that current processes necessarily be reviewed and redesigned, which can encourage inventory control officers to have a commitment towards organizational objectives. Additionally, the conflicting or overlapping behavior of systems should be eliminated, and positive bureaucracy should only be utilized through standardization instead the personal differences. Standard Operating Procedures (SOPs) should strictly be adhered to achieve common goals. Lastly, the professional qualification should be given preference, and later skill enhancement programs should be arranged for up-keeping of skill levels. Future research can use other population designs with different predictors. The researchers can empirically determine; the impact of inventory management on financial reporting, factors involved in procurement and its relationship with inventory management, and the impact of back-log inventories on business performance.

References

- Afthanorhan, W. M. A. B. W. (2013). A comparison of partial least square structural equation modeling (PLS-SEM) and covariance based structural equation modeling (CB-SEM) for confirmatory factor analysis. *International Journal of Engineering Science and Innovative Technology*, 2(5), 198-205.
- Amirah, N. A., Asma, W. I., Muda, S., Amin, A., & Him, N. F. N. (2019, January). Analysis of Individual Factors on Employees' Perception towards Safety Culture in the Malaysian Manufacturing Industry. In *1st Aceh Global Conference (AGC 2018)*. Atlantis Press.
- Amirah, N., A. (2014). Relationship between Behavioral Aspects, Safety Compliance and Its Effect on Safety Culture in the Manufacturing Industry in Peninsular Malaysia. Universiti Malaysia Terengganu, Terengganu.
- Awang, Z. (2015). *SEM made simple*. Bangi: MPWS Rich Publication.
- Axsater, S. (1985). Control theory concepts in production and inventory control. *International Journal of Systems Science*, 16(2), 161-169.
- Bagozzi, R.P. & Yi, Y (1988). On the evaluation of structural equation models, *Journal of the Academy of Marketing Science*. 16(1), 74-94.
- Barney, J. (1991). Firm resources and sustained competitive advantage. *Journal of management*, 17(1), 99-120.
- Bentler, P. M., & Bonett, D. G. (1980). Significance tests and goodness-of-fit in analysis of covariance structures. *Psychological Bulletin*, 88(3), 588-606.
- Bollen, K.A. (1990). Overall fit in covariance structure models: two types of sample size effects, *Psychological Bulletin*, 107(2), 256-259.
- Boyne, G. A., & Meier, K. J. (2013). Burdened by bureaucracy? Determinants of administrative intensity in public organisations. *International Public Management Journal*, 16(2), 307-327.
- Carver, C. S., & Scheier, M. F. (1982). Control theory: A useful conceptual framework for personality—social, clinical, and health psychology. *Psychological Bulletin*, 92, 111-135.

- Child, D. (2006). *The Essentials of Factor Analysis*. (3rd ed.). New York: Continuum.
- Chin, W. W. (1998). Issues and opinion on structural equation modeling. *MIS Quarterly*, 22(1), 7-16.
- Cohen, J. (1988). *Statistical Power Analysis for the Behavioral Sciences*. (2nd ed.). Lawrence Erlbaum Associates: Hillsdale, NJ.
- Creswell, J. W. (2014). *Research design: Qualitative, quantitative and mixed methods approaches* (4th ed.). SAGE Publications Ltd/Thousand Oaks: SAGE Publication Inc.
- Falk, R. F. & Miller, N. B. (1992). *A Primer for Soft Modeling*. University of Akron Press: Akron, OH.
- Field, A. (2013). *Discovering Statistics using SPSS*, 4th edn. London: SAGE.
- Gefen, D. & Rigdon, E. E. (2011). An update and extension to SEM guidelines for administrative and social science research. *MIS Quarterly*, 35(2), 1-7.
- Hair, J. F. J., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). *Multivariate Data Analysis. A global perspective*. (7th Ed.). USA: Prentice Hall.
- Hair, J.F., Hult, G.T.M., Ringle, C.M. & Sarstedt, M. (2013), *A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM)*. Sage Publications: CA.
- Hair, J.F., Ringle, C.M. & Starstedt, M. (2011). PLS-SEM: indeed a silver bullet. *Journal of Marketing Theory and Practice*, 19(2), 139-151.
- Hashmi, A. R., Amirah, N. A., & Yusof, Y. (2020). Structural Equation Modeling: Mediation of integrated systems in supply chain management practices and public healthcare performance. *International Journal of Management and Sustainability*, 9(3).
- Henseler, J. (2012). Why generalized structured component analysis is not universally preferable to structural equation modeling. *Journal of the Academy of Marketing Science*, 40(3), 402-413.
- Hsu, C. C., Tan, K. C., Kannan, V. R., & Keong L. G. (2009). Supply chain management practices as a mediator of the relationship between organizational capability and firm performance. *International Journal of Production Research*, 47(3), 835-855.
- Jöreskog, K. & Sörbom, D. (1993). *LISREL 8: Structural Equation Modeling with the SIMPLIS Command Language*. Scientific Software International Inc.: Chicago, IL.
- Kiilu, C. (2016). The Influence of Goods Receipt and Sorting and Loading and Delivery to Client Practices on Inventory Management Performance in Humanitarian Organizations; A Case Study of Afghan Red Crescent Society Medical Supply Chain. *International Journal of Supply Chain Management*, 1(1), 62-74.
- Kline, R. B. (2010). *Principles and practice of structural equation modelling* (4th ed.). New York: The Guilford Press.
- Meier, K. J., Polinard, J. L., & Wrinkle, R. D. (2000). Bureaucracy and organizational performance: Causality arguments about public schools. *American Journal of Political Science*, 44(3), 590-602.
- Ng'ang' a, J. K. (2013). An Assessment of the Factors Influencing Effectiveness of Inventory Control; Ministry of State for Provincial Administration and Internal Security, Nairobi – Kenya. *International Journal of Business and Commerce*, 3(1), 33-53.
- Ondari, L. M. & Muturi (2016). Factors affecting the efficiency of inventory management in organizations in Kenya. *International Journal of Economics, Commerce and Management United Kingdom*, IV(4), 1019-1034.
- Preacher, K. J. & Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in simple and multiple mediator models. *Behavior Research Methods*, 40(3), 879-891.
- Rashid, A. (2016). Impact of Inventory Management in Downstream Chains on Customer Satisfaction at Manufacturing Firms. *International Journal of Management, IT and Engineering*, 6(6), 1-19.
- Rashid, A., & Amirah, N. A. (2017). Relationship between poor documentation and efficient inventory control at Provincial Ministry of Health, Lahore. *American Journal of Innovative Research and Applied Sciences*, 5(6), 420-423.
- Rashid, A. Amirah, N. A., & Yusof, Y. (2019). Statistical approach in exploring factors of documentation process and hospital performance: a preliminary study. *American Journal of Innovative Research and Applied Sciences*, 9(4), 306-310.
- Rehman, S. U., Mohamed, R., & Ayoup, H. (2019). The mediating role of organizational capabilities between organizational performance and its determinants. *Journal of Global Entrepreneurship Research*, 9(1), 30.
- Shabbir, A., Malik, S. A., Malik, S. A. (2016). Measuring patients' healthcare service quality perceptions, satisfaction, and loyalty in public and private sector hospitals in Pakistan. *International Journal of Quality & Reliability Management*, 33(5), 538-557.
- Shibin, K. T., Gunasekaran, A., & Dubey, R. (2017). Explaining sustainable supply chain performance using a total interpretive structural modeling approach. *Sustainable Production and Consumption*, 12, 104-118.
- Silva, P., & Ferreira, A. (2010). Performance management in primary healthcare services: evidence from a field study. *Qualitative Research in Accounting & Management*, 7(4), 424-449.
- Steiger, J. H. (1990): Structural model evaluation and modification: an interval estimation approach. *Multivariate Behavioral Research*, 25(2), 173-180.
- Tabachnick, B. G., & Fidell, L. S. (2013). *Using multivariate statistics* (6th ed.). Boston: Pearson Education, Inc.
- Walker, R. M., & Brewer, G. A. (2008). An organizational echelon analysis of the determinants of red tape in public organizations. *Public Administration Review*, 68(6), 1112-1127.
- Wei, Y. (2012). Optimization and optimality of a joint pricing and inventory control policy in periodic-review systems with lost sales. *OR spectrum*, 34(1): 245-250.
- Wernerfelt, B. (1984). A resource-based view of the firm. *Strategic Management Journal*, 5, 171-180.
- Yusof, Y. Awang, Z. Jusoff, K. & Ibrahim, Y. (2017). The influence of green practices by non-green hotels on customer satisfaction and loyalty in hotel and tourism industry. *International Journal of Green Economics*, 11(1), 1-14.

