MODELLING THE LIVED EXPERIENCES OF CONSUMERS: A CASE OF MDR-TB PATIENTS IN MPUMALANGA PROVINCE

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Abstract: Documenting the experiences of customers has always been important for contributing to the value of the organisation and the creation and maintenance of satisfied customers. The aim of this research was to determine the experiences of MDR-TB patients and develop model and a framework that guide the provision of patient-centred care for MDR-TB patients. Quantitative data were collected from 256 MDR-TB patients in public hospitals in Mpumalanga province. Factor analysis was performed and yielded 5 factors namely coordination and integration, involvement of friends and relatives, spirituality, environmental care, and continuity of care as significant factors that account for a patient-centred care framework for MDR-TB patients. The factors were subjected to logistical regression. The research concludes that management of public health-care institutions, policy-makers, and government have critical role to play because there is dissatisfaction with the current levels of patient-care being delivered. Moreover, it concludes that the 5 dimensions of patient-centred care require special attention if management of public health-care institutions in Mpumalanga province were to focus on differentiating themselves in terms of how they continuously provide and manage patient-centred health-care services. The dimensions were ranked in terms of their strength in predicting the patient-centred care standards MDR-TB patients require. Coordination and integration is the most significant predictor followed by spirituality, and involvement of friends and family respectively. Environmental care and continuity of care were found having equal strength. In spite the order, all dimensions require special attention. It is recommended that management and government must be proactive about the provision and management of patient-centred care in public health-care institutions. They must exhibit support for patient-centred care by making sure that the required resources are available. Of importance is the need to consider the role of religion and the involvement of friends and family members. The study offers directions for future research.

Keywords: Customer experience; MDR-TB patients; Patient-centred health care services, ordered logistic regression analysis

Introduction

The research aims to develop a model and subsequently construct a framework for the provision and management of patient-centred care of MDR-TB patients. This is important as it contributes to an understanding of MDR-TB patients' experiences and how the management of public health institutions and policy-makers ensure responsiveness and quick delivery of quality services. In line with this view, exploring customers' experiences about their interactions with public health institutions and healthcare staff makes business sense and it forms a critical part of consumer behaviour (MacFarlane and Stafford, 2016; Richards et al., 2015).

Notwithstanding the importance of exploring patients' experiences, their lived experiences have received limited research focus (Dawood and Padayatchi, 2017). Furthermore, the inadequate research on the experiences of MDR-TB patients specifically in South Africa seems to have been confined only to KwaZulu-Natal, Eastern and Western Cape provinces (Marais et al., 2014; Okoror et al., 2014; Tudor et al., 2014) except for Mpumalanga province which is the focus of the current research. This section introduced the concept of lived experiences and stresses the importance of exploring patients' experiences as a business case. Several studies (e.g. Mutingi, 2018; Sukwadi, 2015; Zhang et al., 2018) examined the concept of customer experiences in terms of its contributions to the value of the organisation without considering its contributions to the creation and maintenance of satisfied customers. The next section defines customer experiences to shed light on how patients as customers of health institutions must be managed. The rest of the paper is structured as: review of literature on customer experiences, research problem, research methods, results and discussion, conclusions, recommendations and further research.

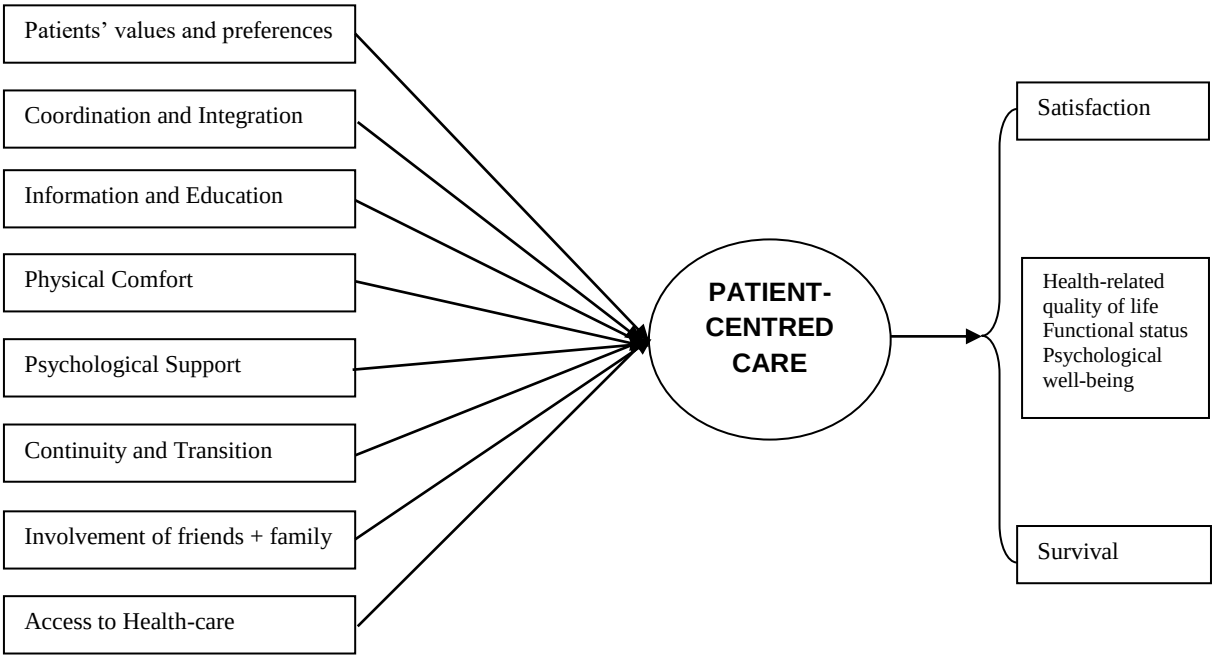
Customer Experiences

Customer experience as a concept is located within the broad field of marketing and seeks to understand consumer behaviour so that marketers can identify the best ways of enhancing their relationships with customers (Kartajaya et al., 2019; Lee and Day, 2019). Notwithstanding its importance and the positive attention it has received in the marketing literature, the concept remains vague and lacks a solid theoretical foundation (Kartajaya et al., 2019; Mutingi, 2018). Some scholars (e.g. Mutingi, 2018; Zhang et al., 2018) propose a new perspective of marketing whose goal is still to customise offerings and then recognise the customer to extent that they are regarded as co-producers in order to ensure sustainable competitive advantage. This new viewpoint centres on understanding customers' thinking and buying behaviour which engenders the concept of customer experience (Kartajaya et al., 2019; Manral and Harrigan, 2018).

Several researchers (e.g. Lappalainen, 2017; Mutingi, 2018) delineate customer experience as a collection of signals that comprise both functional and emotional components. There is consensus that understanding customer experience at any point in the value chain brings forth a chance for determining new as well as innovative ways of creating and delivering value (Lemon and Verhoef, 2016; Palacios-Marques et al., 2016). The contemporary customer is distinct in that they want to shape and become co-creators of their experiences with products and services. According to Rosenberg (2015), customer experiences rely on the customer's specific need(s) and their unique circumstances which require being personalised such as the case with patients.

Moreover, products/services create experiences that transcend that products/services (Palacios-Marques et al., 2016). In line with Zhang et al. (2018), the customers must assess an offering not only in terms of its characteristics but the extent to which the offering provides the experiences that they long for. For customer experience to be an effective marketing tool, it must be attractive, robust, fascinating and unforgettable (Rosenberg, 2015; Zhang et al., 2017).

The proposed conceptual framework is structured as follows:



Such robustness implies an all-inclusive perspective of experience. As said by Homburg et al. (2017), customer experience requires being examined from an all-inclusive perspective and involves concurrently enhancing product offerings and the latter researcher concludes that loyalty becomes the total of customers' experiences across all dimensions.

The literature identifies a total of eight dimensions constituting the sum of patients' experiences namely: respect for patient's values and preferences, coordination and integration of care, information and education, physical comfort,

emotional support and alleviation of fear and anxiety, the involvement of family and friends, continuity and transition, and access to care. Each dimension is an independent variable while the provision of patient-centred care is the dependent variable. The outcomes of the provision of patient-centred care are envisioned as satisfaction, survival, health-related quality of life, functional status and emotional well-being. The outcomes are shown in the proposed conceptual framework. The hypotheses are, therefore:

H_1 Respecting patients' values positively influences the provision of patient-centred care
H_2 Coordination and integration of care positively influence the provision of patient-centred care
H_3 Information and education positively influence the provision of patient-centred care
H_4 Physical comfort positively influences the provision of patient-centred care
H_5 Emotional support positively influence the provision of patient-centred care
H_6 Involvement of family and friends positively influences the provision of patient-centred care
H_7 Continuity and transition positively influence the provision of patient-centred care
H_8 Access to healthcare positively influences the provision of patient-centred care

Research Problem

There are rampant cases of MDR-TB patients in South Africa. Globally, South Africa is among those countries with high statistics of MDR-TB patients (Marais et al., 2014). Research that focuses on the public health sector amply records lived experiences of healthcare staff. However, while there is a limited enquiry that explicitly sought to record on MDR-TB patients' experiences (Marais et al., 2014). An understanding of patients' experiences assists management and policy-makers to ensure responsiveness as well as prompt delivery of quality services. Thus, studying customers' experiences and their interactions with the public health institutions and healthcare staff makes business sense because it contributes to a new understanding of consumer behaviour particularly on relationship marketing (MacFarlane and Stafford, 2016; Richards et al., 2015). Because of the limited research on MDR-TB patients' experiences, no framework guides the provision of patient-centred care for this specific cohort. This research addresses the paucity by developing a model constructing a framework for the provision and management of patient-centred care in South Africa's health institutions which is the focus of the research.

Research Methods

Primary data were collected from 256 MDR-TB patients in public healthcare institutions in Mpumalanga province. Questionnaires were distributed to MDR-TB patients in hospitals so that they shed light on their lived experiences in Mpumalanga province. Factor analysis involving varimax rotation was performed to reduce the variables. The resultant factors were subjected to logistical regression. Regression models were used to show the relationship between a single independent Y and one or more independent variables, $X_1, X_2,.....X_5$. The models also evaluated the effect of or relationship between explanatory variables on the response and for the general description of data structure. It is supposed that Y is the independent binary denoting the provision and management of patient-centred care for MDR-TB patients in Mpumalanga. Y is transformed so that the regression is used. Age and sex are categorical independent variables.

The following is the Logistic Regression Model for Patient-Centred Care:

$$\ln\left[\frac{p_i^{PatientCare}}{1-p_i^{PatientCare}}\right] = \beta_0^{PatientCare} + \sum_{j\in J}\beta_j^{Stage}\text{Stage}_{ij} + \sum_{j\in J}\beta_j^{Comm}\text{Comm}_{ij} + \sum_{j\in J}\beta_j^{PersonCare}\text{PersonCare}_{ij}$$
$$+ \sum_{j\in J}\beta_j^{ContCare}\text{ContCare}_{ij} + \sum_{j\in J}\beta_j^{AccesInfo}\text{AccesInfo}_{ij} + \sum_{j\in J}\beta_j^{FamilyInv}\text{FamilyInv}_{ij} + \sum_{j\in J}\beta_j^{EnviroCare}\text{EnviroCare}_{ij}$$
$$+ \sum_{j\in J}\beta_j^{Spirit}\text{Spirit}_{ij} + \sum_{j\in J}\beta_j^{Caregiver}\text{Caregiver}_{ij} + \beta^{Gender}\text{Gender} + \beta^{Age}\text{Age} + \beta^{Race}\text{Race}$$
$$+ \beta^{IllPeriod}\text{IllnessPeriod} + \varepsilon_j \qquad (3.1)$$

The equation (3.1) is the logistic regression $p_i^{PatientCare} = \Pr\left[Y_i^{PatientCare} = 1\right]$, which can be written as in equation (3.2):

$$p_i^{PatientCare} = \frac{e^{\left[\begin{array}{l}\beta_0^{PatientCare} + \sum_{j\in J}\beta_j^{Stage}\text{Stage}_{ij} + \sum_{j\in J}\beta_j^{Comm}\text{Comm}_{ij} + \sum_{j\in J}\beta_j^{PersonCare}\text{PersonCare}_{ij} \\ + \sum_{j\in J}\beta_j^{ContCare}\text{ContCare}_{ij} + \sum_{j\in J}\beta_j^{AccesInfo}\text{AccesInfo}_{ij} + \sum_{j\in J}\beta_j^{FamilyInv}\text{FamilyInv}_{ij} + \sum_{j\in J}\beta_j^{EnviroCare}\text{EnviroCare}_{ij} \\ + \sum_{j\in J}\beta_j^{Spirit}\text{Spirit}_{ij} + \sum_{j\in J}\beta_j^{Caregiver}\text{Caregiver}_{ij} + \beta^{Gender}\text{Gender} + \beta^{Age}\text{Age} + \beta^{Race}\text{Race} \\ + \beta^{IllPeriod}\text{IllnessPeriod} + \varepsilon_j\end{array}\right]}}{1 + e^{\left[\begin{array}{l}\beta_0^{PatientCare} + \sum_{j\in J}\beta_j^{Stage}\text{Stage}_{ij} + \sum_{j\in J}\beta_j^{Comm}\text{Comm}_{ij} + \sum_{j\in J}\beta_j^{PersonCare}\text{PersonCare}_{ij} \\ + \sum_{j\in J}\beta_j^{ContCare}\text{ContCare}_{ij} + \sum_{j\in J}\beta_j^{AccesInfo}\text{AccesInfo}_{ij} + \sum_{j\in J}\beta_j^{FamilyInv}\text{FamilyInv}_{ij} + \sum_{j\in J}\beta_j^{EnviroCare}\text{EnviroCare}_{ij} \\ + \sum_{j\in J}\beta_j^{Spirit}\text{Spirit}_{ij} + \sum_{j\in J}\beta_j^{Caregiver}\text{Caregiver}_{ij} + \beta^{Gender}\text{Gender} + \beta^{Age}\text{Age} + \beta^{Race}\text{Race} \\ + \beta^{IllPeriod}\text{IllnessPeriod} + \varepsilon_j\end{array}\right]}} \text{ for}$$

$$0 < p_i^{PatientCare} < 1 \qquad (3.2)$$

Where:

$p_i^{PatientCare}$ = probability of patient-centred care, given coordination & integration factors, communication factors, personalisation of care factors, continuity of care factors, access to information, family involvement, environmental care, spirituality, care for the caregiver, gender, age, race and illness period.

$\frac{p_i^{PatientCare}}{1-p_i^{PatientCare}}$ = odds ratio, given coordination and integration factors, communication factors, personalisation of care factors, continuity of care factors, access to information, family involvement, environmental care, spirituality, care for the caregiver, gender, age, race and illness period

$\beta_0^{PatientCare}$ = constant of the model, given coordination and integration factors, communication factors, personalisation of care factors, continuity of care factors, access to information, family involvement, environmental care, spirituality, care for the caregiver, gender, age, race and illness period

A total of eight hypotheses were developed. At 5% level of significance, the null hypothesis is rejected if the *p*-value obtained from data analysis falls below 5%.

Results and Discussion

Table 1 shows that 49.6% are males and 50.5% are females. Due to the small difference in terms of gender distribution, there is an even distribution of participants. All participants are aged between 20 and 61+ years where most participants are aged 31-50 years (63%). From Table 1, those aged 31-40 years are dominating followed by the 41-50 age range. Those in 20-30 years range are 21%, 51-60 years and 61+ years are 28% and 12% respectively. The responses reveal that each range is well-represented. In terms of race and period of illness, most participants are black (97.3%) and in 0-5 years (97.3%) group respectively. A total of 51.5% perceive services as not meeting patient-centred care standards. The remainders of 18.3% and 30.2% perceive services as meeting the patient-centred care standards and neutral in their responses respectively.

Table 1: Results of the descriptive analysis of profiles of participants

Demographic characteristics		%
Gender	Male	49.6
	Female	50.4
Age	21-30 years	21.2
	31-40 years	34.1
	41-50 years	29.0
	51-60 years	11.0
	61+ years	4.7
Race	Black	97.3
	White	02.0
	Coloured	0.8
Period of Illness	0-5 years	94.1
	6-10 years	3.9
	11-15 years	1.6
	16+ years	0.4
Overall Rating	Do not meet the criteria	21.6
	Not sure	46.0
	Meet criteria	26.8

Cronbach's alpha is a measure of how closely related a set of variables are as a group. In other words, it is a measure of scale reliability. In Table 2, the overall Cronbach's alpha is 0.871 for items which indicate a high level of internal consistency of the scale with this specific sample.

Table 2: Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	No of Items
.871	.876	72

Table 3: Item by item reliability test

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
AGE	150.032	523.790	-.010	.874
GENDER	152.028	521.888	.102	.871
RACE	151.472	524.474	-.006	.871
ILLNESS	151.421	523.082	.070	.871
COMMITMENT	150.708	517.324	.196	.870
EXPECTATIONS	150.648	514.229	.263	.870
SHARE	150.667	510.958	.367	.869
PROVIDEINPUT	150.486	507.897	.364	.869
HOSPITALCOMMITTEE	150.245	505.246	.404	.868
GUIDETHEHOSPITAL	150.417	510.188	.349	.869
JOBDESCRIPTION	150.593	509.536	.344	.869
SHAREIDEAS	150.495	510.940	.299	.869
PATIENTSampSTAFF	150.352	508.294	.357	.869
PATIENTSampFAMILIES	150.213	507.071	.329	.869
MANAGERS	150.560	507.066	.421	.868
PHYSICIANS	150.667	512.753	.327	.869
TOPLEADERSHIP	150.259	502.798	.421	.868
PATIENTSAFETY	150.787	511.006	.387	.869

ESCALATEQUESTIONS	150.565	513.317	.266	.870
SYSTEMSAREINPLACE	150.625	516.040	.195	.871
WHENMEALS	150.713	510.178	.365	.869
WHENPROCEDURES	150.532	511.069	.273	.870
RESOURCES	150.296	510.786	.139	.873
FOODOPTIONS	150.565	506.740	.198	.872
FOODISAVAILABLE	150.505	507.851	.330	.869
PARTICIPATEINROUNDS	149.944	506.248	.321	.869
CHANGEOFSHIFTS	149.694	508.018	.283	.870
PLANSOFCARE	150.259	508.463	.287	.869
OPPORTUNITIESEXIST	150.347	511.604	.280	.870
TOOLS	150.491	509.107	.334	.869
DISCHARGEPLANNING	150.546	512.286	.294	.869
REINFORCEampASSESS	150.380	512.981	.264	.870
PROCESSINPLACE	150.514	515.535	.206	.870
MEDICALRECORDS	150.620	512.348	.335	.869
OPPORTUNITYTOREVIEW	150.546	512.537	.274	.870
OWNPROGRESSNOTES	150.181	517.274	.122	.872
PATIENTEDUCATION	150.481	511.144	.317	.869
HEALTHLIBRARY	150.079	507.291	.321	.869
UNANTICIPATEDOUTCOMES	150.171	512.096	.251	.870
DEFINED	150.458	508.882	.335	.869
VISITATION	150.139	514.353	.184	.871
FORMALISEDTRAINING	150.546	509.170	.351	.869
RAPIDRESPONSE	150.125	510.017	.299	.869
CODESampRESUSCITATION	150.120	508.916	.302	.869
SUPPORT	150.319	513.102	.239	.870
COMFORTABLE	150.157	511.733	.231	.870
OVERNIGHT	149.912	508.732	.265	.870
ADEQUATESUPPORT	150.380	511.948	.252	.870
MAINFOYER	150.611	510.918	.318	.869
ENTRANCEPARKINGLOTS	150.634	508.438	.384	.868
INFORMATIONDESK	150.662	513.974	.261	.870
UNITBASEDNURSES	150.588	513.750	.251	.870
PRIVACY	150.574	509.753	.328	.869
SEMIPRIVATEROOMS	150.454	510.602	.268	.870
TEMPERATURE	150.222	510.816	.247	.870
OUTDOORS	150.218	510.915	.200	.871
LOUNGEAREAS	150.236	505.958	.319	.869
DIVERSIONARY	150.079	507.840	.300	.869
OVERHEADPAGING	150.097	513.195	.195	.871
PLEASANTSMELLING	150.208	515.040	.171	.871
SIGNAGE	150.222	513.150	.232	.870
FINDTHEIRWAY	150.370	508.271	.324	.869
EDUCATEPATIENTS	150.032	510.338	.269	.870
BELIEFSYSTEMS	149.954	505.886	.336	.869
QUIETCONTEMPLATION	150.125	505.980	.356	.868
INTEGRATIVETREATMENT	150.120	507.688	.313	.869
RELIGION	150.454	513.979	.211	.870
STRESSREDUCTION	150.259	506.825	.373	.868
ROUTINELY	150.199	510.169	.292	.869
INPUT	150.199	501.537	.429	.867
SPACE	149.806	502.464	.364	.868
HEALTHFOOD	149.898	510.650	.196	.871

Source: SPSS Output

The KMO measures the sampling adequacy which determines if the responses given with the sample are adequate, or not. Kaiser (1974) recommend values between 0.7 to 0.8 and referring to Table 4, the KMO measure is 0.702 which is close 0.7, and thus the sample is adequate.

Table 4: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.702
Bartlett's Test of Sphericity	Approx. Chi-Square	2161.009
	df	528
	Sig.	.000

Bartlett's test indicates the strength of relationships among variables. It tests the null hypothesis that the correlation matrix is an identity matrix in which all of the diagonal elements are 1 and all off-diagonal elements are close to 0. Table 4 shows Bartlett's Test of Sphericity's p-value is 0.00 and indicates that it is significant at 0.05 level to reject the null hypothesis. This means that a correlation matrix is not an identity matrix. The preliminary factor analysis yielded an incalculable number of initial or provisional factors because there were cross-loadings making interpretation problematic. Varimax rotation was performed transforms the preliminary factors into 5 new factors in Table 5 that are easy to interpret which are named as follows:

Table 5: Final factors after varimax rotation

	Component										
	1	2	3	4	5	6	7	8	9	10	11
SHARE	.682										
PROVIDEINPUT	.735										
HOSPITALCOMMITTEE	.783										
GUIDETHEHOSPITAL	.679										
PARTICIPATEINROUNDS					.544						
CHANGEOFSHIFTS					.820						
PLANSOFCARE					.622						
RAPIDRESPONSE			.682								
CODESampRESUSCITATION			.719								
COMFORTABLE			.547								
OVERHEADPAGING				.699							
PLEASANTSMELLING				.763							
FINDTHEIRWAY				.628							
BELIEFSYSTEMS		.741									
QUIETCONTEMPLATION		.756									
SPACE		.561									

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 17 iterations.

Based on the 5 factors, we present different logistic regression models for a set of services. Table 6 presents the original coding of the dependent variable where *0* denotes those respondents who think services rendered do not meet patient-centred care standards and *1* denotes respondents who feel the services meet the standards.

Table 6: Dependent Variable Encoding

Original Value	Internal Value
0	0
1	1

$$\text{logit}(p) = \log\left(\frac{p(y=1)}{1-(p=1)}\right) = \beta_0 + \beta_1 \cdot x_{i2} + \beta_2 \cdot x_{i2} + \ldots + \beta_p \cdot x_{in} \text{ for } i = 1 \ldots n .$$

We want to model the chance of services meeting patient-centred care standards as a function of a set of services currently provided.

Block 0: Beginning

In this section, we present the null model results as Block 0 results. The Block 0 output is for a model that includes only the intercept.

Table 7: Services Rendered Set of Null Model– Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	-1.077	.146	54.534	1	.000	.341

The Wald Chi-square tests the null hypothesis that the constant equals 0. This hypothesis is rejected since the p-value is smaller than the critical p-value of 0.05. Hence, we conclude that the constant is not 0 and the predicted odds of services meeting patients centred care standards is 0.341.

Table 8: Service Rendered Set of Null Model – Overall Percentage

	Observed		Predicted		
			OVERALLRATING		% Correct
			0	1	
Step 0	OVERALLRATING	0	185	0	100.0
		1	63	0	.0
	Overall Percentage				74.6

a. Constant is included in the model.
b. The cut value is .500

Given the base rates of the two decision options (185/248 = 74.6% viewed services do not meet patients centred care standards, while 25.4% viewed services do meet patients centred care standards), and no other information, the best strategy is to predict, for every case, that the subject will view services do not meet patient-centred care standards. Using that strategy, we would be correct 83.9% of the time. Thus, the overall percentage of cases correctly predicted by the null model is 78.4%.

Table 9: Services Rendered Set of Null Model – Variables not in the Equation

Variables not in the Equation			Score	df	Sig.
Step 0	Variables	GUIDETHEHOSPITAL	19.498	4	.001
		GUIDETHEHOSPITAL(1)	6.725	1	.010
		GUIDETHEHOSPITAL(2)	.006	1	.939

GUIDETHEHOSPITAL(3)	.000	1	.987
GUIDETHEHOSPITAL(4)	12.421	1	.000
PATIENTSampSTAFF	11.534	4	.021
PATIENTSampSTAFF(1)	11.238	1	.001
PATIENTSampSTAFF(2)	3.941	1	.047
PATIENTSampSTAFF(3)	1.134	1	.287
PATIENTSampSTAFF(4)	.083	1	.774
MANAGERS	11.962	3	.008
MANAGERS(1)	4.698	1	.030
MANAGERS(2)	.007	1	.931
MANAGERS(3)	.644	1	.422
PARTICIPATEINROUNDS	14.994	4	.005
PARTICIPATEINROUNDS(1)	8.244	1	.004
PARTICIPATEINROUNDS(2)	.898	1	.343
PARTICIPATEINROUNDS(3)	3.978	1	.046
PARTICIPATEINROUNDS(4)	1.000	1	.317
LOUNGEAREAS	10.179	4	.038
LOUNGEAREAS(1)	5.489	1	.019
LOUNGEAREAS(2)	.001	1	.979
LOUNGEAREAS(3)	.002	1	.962
LOUNGEAREAS(4)	3.683	1	.055
OVERHEADPAGING	5.270	4	.261
OVERHEADPAGING(1)	1.800	1	.180
OVERHEADPAGING(2)	.325	1	.569
OVERHEADPAGING(3)	3.293	1	.070
OVERHEADPAGING(4)	.068	1	.795
BELIEFSYSTEMS	1.760	4	.780
BELIEFSYSTEMS(1)	.847	1	.357
BELIEFSYSTEMS(2)	1.500	1	.221
BELIEFSYSTEMS(3)	.027	1	.870
BELIEFSYSTEMS(4)	.179	1	.672
HEALTHFOOD	4.864	4	.302
HEALTHFOOD(1)	.257	1	.612
HEALTHFOOD(2)	1.515	1	.218
HEALTHFOOD(3)	1.263	1	.261
HEALTHFOOD(4)	3.092	1	.079
TEMPERATURE	14.585	4	.006
TEMPERATURE(1)	6.085	1	.014
TEMPERATURE(2)	.201	1	.654
TEMPERATURE(3)	1.070	1	.301
TEMPERATURE(4)	3.683	1	.055
QUIETCONTEMPLATION	4.965	4	.291
QUIETCONTEMPLATION(1)	.691	1	.406
QUIETCONTEMPLATION(2)	1.519	1	.218
QUIETCONTEMPLATION(3)	.125	1	.723
QUIETCONTEMPLATION(4)	2.130	1	.144
PRIVACY	7.340	4	.119
PRIVACY(1)	1.594	1	.207

	PRIVACY(2)	.004	1	.950
	PRIVACY(3)	.029	1	.865
	PRIVACY(4)	6.572	1	.010
	TOPLEADERSHIP	8.893	4	.064
	TOPLEADERSHIP(1)	2.173	1	.140
	TOPLEADERSHIP(2)	1.964	1	.161
	TOPLEADERSHIP(3)	4.809	1	.028
	TOPLEADERSHIP(4)	.945	1	.331
Overall Statistics		88.187	47	.000

Source: SPSS Output

The score test in Table 9 is used to predict whether an independent variable would be significant in the model. Looking at p-values, each of the predictors would be statistically significant except the 'Beliefsystems' and 'Quietcontemplation' variables. The overall statistic p = 0 shows the result of including all predictors into the model, and in this case, is significant at 5% level.

Block 1: Method

Block 1 shows the results after the addition of the explanatory variables selected, thus it shows the overall test of the full model.

Table 10: Services Rendered Set - Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	110.510	47	.000
	Block	110.510	47	.000
	Model	110.510	47	.000

The Omnibus Tests of Model Coefficients table gives the result of the likelihood ratio test which indicates whether the inclusion of this block of variables contributes significantly to model fit. In Table 10, the p-value of the block is 0.00 and is less than 0.05 significance level, which means that the Block 1 model is a significant improvement to the Block 0 model.

Table 11: Services Rendered Set – Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	170.584[a]	.360	.530

a. Estimation terminated at iteration number 7 because parameter estimates changed by less than .001.

In standard regression, the coefficient of determination R^2 value indicates how much variation in the dependent variable is explained by the model. We need to note that the coefficient of determination R^2 cannot be calculated for logistic regression but Table 11 gives the values for two pseudo R^2 values which try to measure something similar. From Table 11, we can conclude that between 36% and 53% of the variation in services rendered can be explained by the model in Block 1.

Table 12: Services Rendered Set of Full Model – Variables in the Equation
Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
	GUIDETHEHOSPITAL			14.866	4	.005*	
	GUIDETHEHOSPITAL(1)	-7.605	2.426	9.827	1	.002*	.000
	GUIDETHEHOSPITAL(2)	-6.719	2.296	8.565	1	.003*	.001
	GUIDETHEHOSPITAL(3)	-8.109	2.441	11.036	1	.001*	.000
	GUIDETHEHOSPITAL(4)	-5.205	2.415	4.644	1	.031*	.005
	PATIENTSampSTAFF			9.249	4	.055**	
	PATIENTSampSTAFF(1)	-.810	2.463	.108	1	.742	.445
	PATIENTSampSTAFF(2)	1.328	2.379	.312	1	.577	3.775
	PATIENTSampSTAFF(3)	1.046	2.398	.190	1	.663	2.847
	PATIENTSampSTAFF(4)	.964	2.346	.169	1	.681	2.623
	MANAGERS			12.901	3	.005*	
	MANAGERS(1)	-3.616	1.117	10.473	1	.001*	.027
	MANAGERS(2)	-3.218	.951	11.453	1	.001*	.040
	MANAGERS(3)	-3.220	1.241	6.738	1	.009*	.040
	PARTICIPATEINROUNDS			10.665	4	.031*	
	PARTICIPATEINROUNDS(1)	-1.156	1.405	.676	1	.411	.315
	PARTICIPATEINROUNDS(2)	.747	1.411	.281	1	.596	2.112
	PARTICIPATEINROUNDS(3)	1.718	1.436	1.432	1	.232	5.574
	PARTICIPATEINROUNDS(4)	1.381	1.465	.888	1	.346	3.979
	LOUNGEAREAS			16.507	4	.002*	
	LOUNGEAREAS(1)	-6.263	1.731	13.085	1	.000*	.002
	LOUNGEAREAS(2)	-4.811	1.566	9.434	1	.002*	.008
Step 1[a]	LOUNGEAREAS(3)	-4.767	1.728	7.607	1	.006*	.009
	LOUNGEAREAS(4)	-4.135	1.692	5.972	1	.015*	.016
	OVERHEADPAGING			7.454	4	.114	
	OVERHEADPAGING(1)	-2.486	1.395	3.176	1	.075**	.083
	OVERHEADPAGING(2)	-2.942	1.512	3.787	1	.052**	.053
	OVERHEADPAGING(3)	-1.299	1.362	.909	1	.340	.273
	OVERHEADPAGING(4)	-2.163	1.488	2.111	1	.146	.115
	BELIEFSYSTEMS			8.533	4	.074**	
	BELIEFSYSTEMS(1)	.455	1.695	.072	1	.788	1.577
	BELIEFSYSTEMS(2)	.464	1.578	.086	1	.769	1.590
	BELIEFSYSTEMS(3)	-.503	1.682	.089	1	.765	.605
	BELIEFSYSTEMS(4)	-2.331	1.603	2.116	1	.146	.097
	HEALTHFOOD			7.169	4	.127	
	HEALTHFOOD(1)	2.580	1.097	5.533	1	.019*	13.203
	HEALTHFOOD(2)	2.516	1.022	6.057	1	.014*	12.383
	HEALTHFOOD(3)	2.209	1.027	4.626	1	.031*	9.103
	HEALTHFOOD(4)	1.422	1.039	1.871	1	.171	4.144
	TEMPERATURE			9.659	4	.047*	
	TEMPERATURE(1)	-4.037	1.582	6.516	1	.011*	.018
	TEMPERATURE(2)	-3.705	1.527	5.891	1	.015*	.025
	TEMPERATURE(3)	-4.356	1.589	7.518	1	.006*	.013
	TEMPERATURE(4)	-3.048	1.646	3.429	1	.064**	.047
	QUIETCONTEMPLATION			16.077	4	.003*	

	QUIETCONTEMPLATION(1)	-2.708	1.411	3.682	1	.055**	.067
	QUIETCONTEMPLATION(2)	-3.200	1.351	5.612	1	.018*	.041
	QUIETCONTEMPLATION(3)	-1.980	1.431	1.915	1	.166	.138
	QUIETCONTEMPLATION(4)	.974	1.258	.599	1	.439	2.649
	PRIVACY			11.106	4	.025*	
	PRIVACY(1)	6.929	3.224	4.618	1	.032*	1021.463
	PRIVACY(2)	5.311	3.162	2.821	1	.093**	202.540
	PRIVACY(3)	5.875	3.213	3.343	1	.067**	356.143
	PRIVACY(4)	7.228	3.174	5.187	1	.023*	1376.830
	TOPLEADERSHIP			6.344	4	.175	
	TOPLEADERSHIP(1)	5.896	2.779	4.502	1	.034*	363.537
	TOPLEADERSHIP(2)	5.592	2.733	4.187	1	.041*	268.224
	TOPLEADERSHIP(3)	5.187	2.687	3.727	1	.054**	178.981
	TOPLEADERSHIP(4)	4.328	2.695	2.579	1	.108	75.788
	Constant	6.724	3.799	3.133	1	.077**	831.990

a. Variable(s) entered on step 1: GUIDETHEHOSPITAL, PATIENTSampSTAFF, MANAGERS, PARTICIPATEINROUNDS, LOUNGEAREAS, OVERHEADPAGING, BELIEFSYSTEMS, HEALTHFOOD, TEMPERATURE, QUIETCONTEMPLATION, PRIVACY, and TOPLEADERSHIP.
b. * Significant at alpha = 0.05 and ** significant at alpha = 0.1.

The B values are the log-odds coefficients for the logistic regression equation for predicting services to meet patients centred care standards. The estimates in Table 12 shows the extent of the relationship between services meeting standards and the dependent variable, where service standards variable is on the logit scale.

We note that 'Participateinrounds' and 'Beliefsystems' most categorical variables are not significantly different from 0, since their p-values calculated are greater than 10% significance level. The dominant variables are the 'Guidethehospital (4)', 'Guidethehospital (1)', and 'Privacy (4)'. So, for every one-unit increase in 'Guidethehospital (4)' score, we expect an 8.109 decrease in the log-odds of service standards, holding all other independent variables constant. Also, for every one-unit increase in 'Privacy (4)', we expect a 7.605 increase in the log-odds of service standards, holding all other independent variables constant.

If B is a negative value, the odds of service standards decrease. 'Overheadpaing', 'Healthfood' and 'Topleadership' overall coefficient are not listed because they are not variables in the model. We need to note that they are not significant at 10% level. All categories of 'Managers', Loungeareas' and 'Temperature' are all statistically significant at 5% and 10% level.

Table 13: Services Rendered Set of Full Model – Overall Percentage

	Observed		Predicted		
			OVERALLRATING		Percentage Correct
			0	1	
Step 1	OVERALLRATING	0	TN =171	FP = 14	92.4
		1	FN = 26	TP = 37	58.7
	Overall Percentage				83.9

a. The cut value is .500

In Table 13, we focus on false positive and false negative error rates in classification. A false positive means predicting that services rendered are meeting patients' centred care standards when, in fact, they did not meet. In Table 13, the decision rule predicted a decision that services rendered met patients' expectations 51 times, and the prediction was wrong 14 times. Thus, we have a false positive rate of 22.2% (14/(26+37).

Model Diagnosis

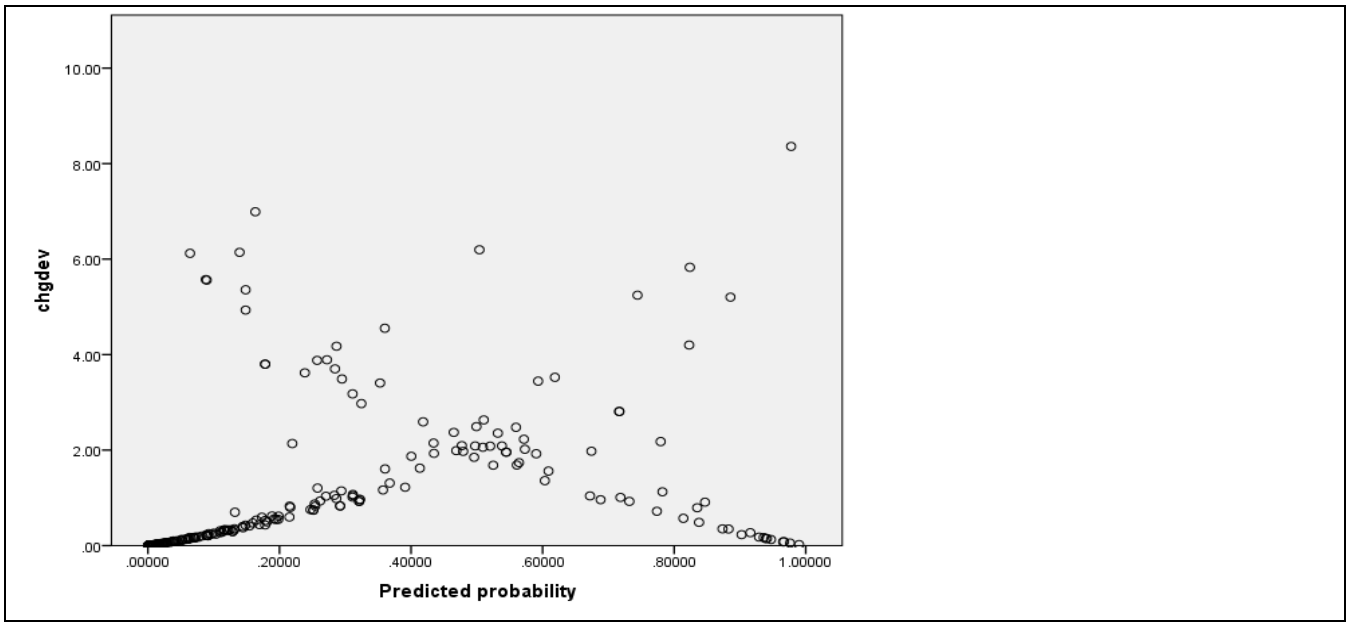


Figure 1: Change in Deviation versus Predicted Probability

A false negative would be predicting that the service rendered did not meet patients centred care standards when, in fact, they did meet the standards. The decision rule predicted a decision that services did not meet patients centred care standards 197 times. That prediction was wrong 26 times, for a false negative rate of 13.2% (26/(171+14)). Referring to Table 12, the correct classification rate increased by 9.3% from 74.6% for the null model to 83.9% for the full model.

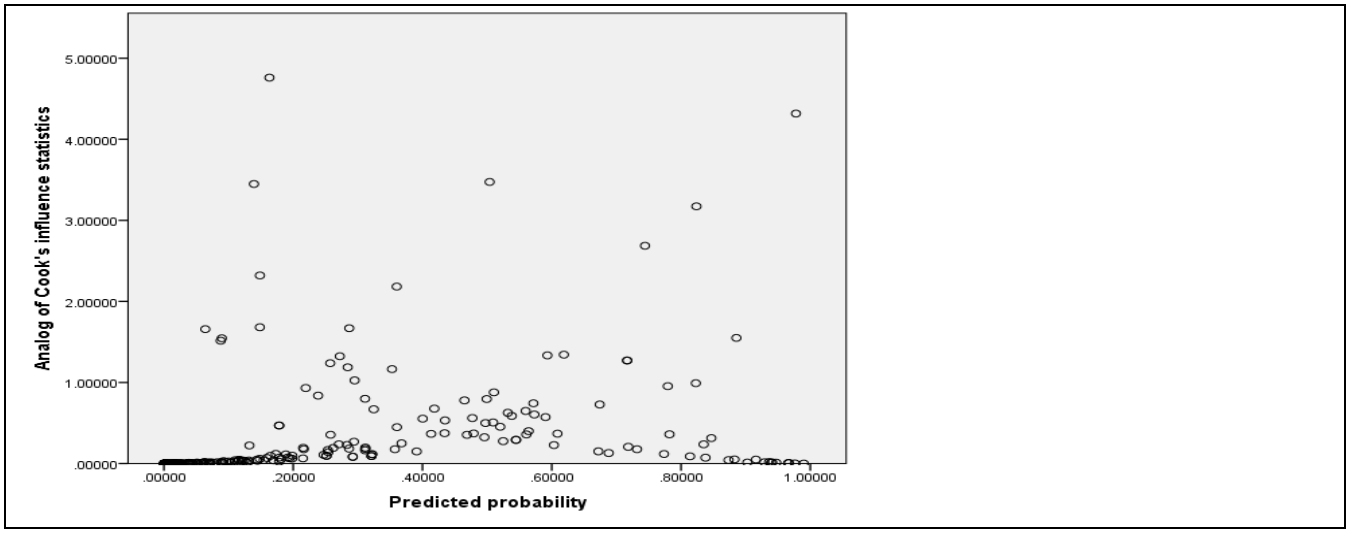


Figure 5.6: Cooks Influence Statistics versus Predicted Probability

The curve that extends from the lower left to the upper right corresponds to cases in which the dependent variable has a value of 0. Thus, services rendered that do not meet patients centred care standards have large model-predicted probabilities and they moderately fit by the model. On the other hand, the curve that extends from the upper left to the lower right corresponds to cases in which the dependent variable has a value of 1. Thus, services that do meet patient-centred care standards have moderate model-predicted probabilities of service rendered and are moderately fit by the model. We conclude that the model is suitable and results are reliable even if we might be required to further examine other services that improve the model performance.

Conclusions

Based on the findings the full model for patient-centred care is summarised as:

$$\text{logit}(p) = \log\left(\frac{p(y=1)}{1-(p=1)}\right) = \beta_0 + \beta_1 \cdot x_{i2} + \beta_2 \cdot x_{i2} + \ldots + \beta_p \cdot x_{in} \text{ for } i = 1 \ldots n .$$

In terms of the ranking of how each of the factors predicts if the dimension meets patient-centred care standards, the logistic regression ranked the factors as follows:

Table 14: Factors based on factor analysis and their ranking

	FACTOR	RANKING OF FACTORS
1	Coordination and Integration	1
2	Spirituality	4
3	Involvement of Friends and Family	3
4	Environmental Care	2
5	Continuity of Care	4

Based on the ranking, it is clear that 'Coordination and Integration' is the strongest predictor of what MDR-TB patients perceive to be patient-centred care standards in public hospitals. 'Environmental Care ', 'Involvement of Relatives and Family follow this and the remaining two factors (Spirituality and Continuity of Care) have equal specifically relate to MDR-TB patients is presented as follows:

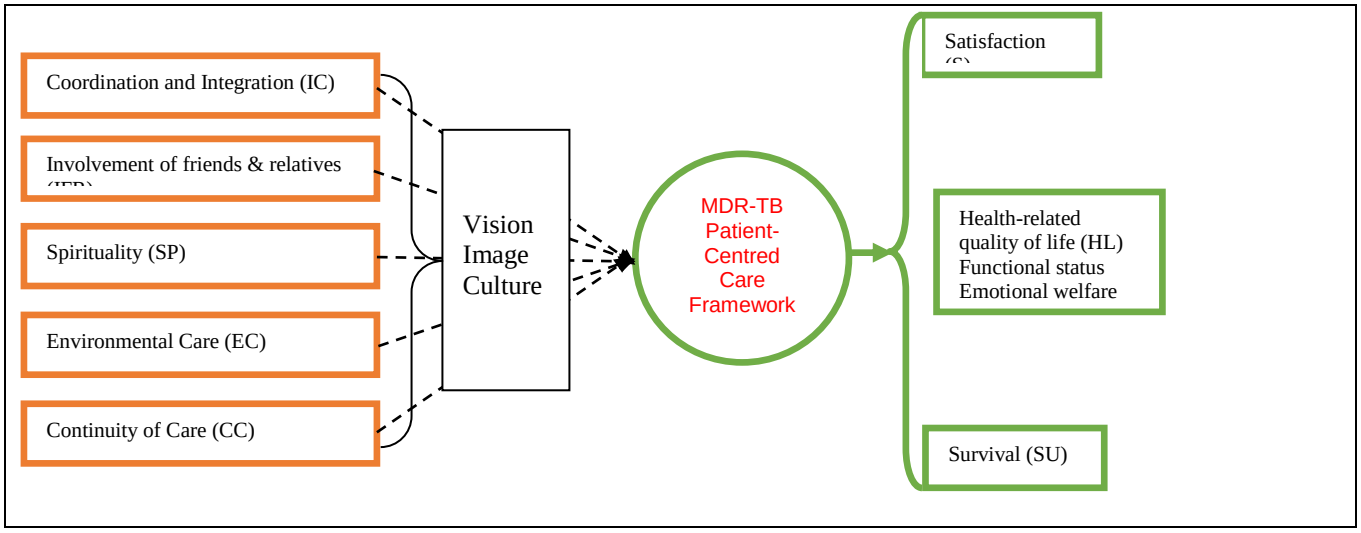


Figure 6.1: MDR-TB patient-centred care framework.

The model presented above is in the form of a statistical formula. It has been simplified and expounded on in the MDR-TB patient-centred care framework below. The model shows that for management of public hospitals in Mpumalanga province to be effective in providing and managing patient-centred care in the province they need to focus particularly on those five dimensions which will ultimately lead to satisfaction, healthy life, sound emotional and functional well-being, and longer life. Based on the literature, the provision and management of the dimensions of patient-centred care must be guided by the vision, image, and culture of the organisation.

Recommendations

Based on the conclusions above, the following recommendations are made:

- Health-care specialists and management must make efforts to provide and manage patient-centred care to all MDR-TB patients irrespective of gender. This is because the results show that their expectations are the same.
- Health-care specialists, management of public hospitals and the government must prioritise the provision and management of a coordinated and integrated health-care delivery system and shown concern for the environment in which MDR-TB patients are receiving health-care services. The involvement of friends and relatives must not be overlooked, so are spiritual and concern for continuity of care.
- Management must constantly gather information regarding patients' expectations. This is because patients, as consumers, their tastes and preferences may be dynamic.

Limitations and Further Research

The limitations of this research include the fact that it lied only on collecting and analysing quantitative data only. A mixed-methods approach where qualitative data was also collected would have been more appropriate to provide a critical and objective of the phenomenon. Moreover, the research focused on Mpumalanga province which may impact on the generalisability of the results. Finally, it focused on MDR-TB patients which suggest that the results may not be generalised to patients with other conditions.

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