

The relationships between structure, process and outcome as a measure of quality of care in the integrated chronic disease management model in rural South Africa

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Outline

- Background
- Theoretical framework
- Study aim and objectives
- Methods
- Results
- Conclusions

INTEGRATED CHRONIC DISEASE MANAGEMENT Manual



Background

- Chronic diseases expand beyond traditional NCDs to include HIV/AIDS
- In 2012, NCDs accounted for 38 million of the world's 57 million deaths
 - Three-quarter of these 38 million deaths occurred in LMICs
- Mortality due to NCDs estimated to increase to 55 million by 2030
 - Africa will have the greatest increase
- In 2012, HIV accounted for 1.5 million (2.7%) global deaths
 - Ranking the 6th global cause of death

Background

- Dual disease burden in South Africa - stalled epidemiological transition
 - NCDs e.g. hypertension
 - Chronic communicable diseases (e.g. HIV and TB)
- NCDs accounted for 43% of all deaths in S/Africa in 2014
- HIV prevalence in S/Africa estimated at 10% in 2014
 - One of the highest in Africa

Background

- Evidence of integrating HIV/AIDS, hypertension and diabetes services in Cambodia:
 - Improved quality of care

- UNAIDS recommends integration of HIV/AIDS and NCD services to:
 - Leverage HIV programme for NCDs
 - Improve quality of chronic disease care
 - Minimise HIV-related stigma
 - Improve patients' health outcomes

Background

- S/Africa's response to the dual burden of HIV/AIDS and NCDs
 - The National Department of Health introduced the ICDM model
 - Pilot of the model was initiated in June 2011 in three Provinces
- The ICDM model:
 - Component of PHC re-engineering; nurse-led
 - **“One-stop-shop” for management of chronic diseases**
 - Expected to enhance quality of care



Background

Components of the ICDM model

■ Facility re-organisation:

- ❑ Supply of critical medicines and equipment
- ❑ Prepacking of medicines
- ❑ Referral
- ❑ Defaulter tracing
- ❑ Appointment system



■ Community-oriented chronic disease care

- ❑ Outreach team serves a catchment population
- ❑ Responsible for 6000 persons, 1500 households
- ❑ Target: manage 80% of chronic diseases
- ❑ Composition of the PHC outreach team
 - A professional nurse, three staff nurses and six CHWs



■ Health promotion and screening in the population

Statement of the problem

- S/Africa's health care system has yet to adapt to the long-term continuity of chronic care
- Chronic disease care is fragmented within the public health system in S/Africa
- Poor management of NCDs
- Dearth of information on the quality of care in the ICDM model



Study justification

- Better understand how the ICDM model works
- Provide evidence of quality of care in the ICDM model



Research aim and objectives

Study aim:

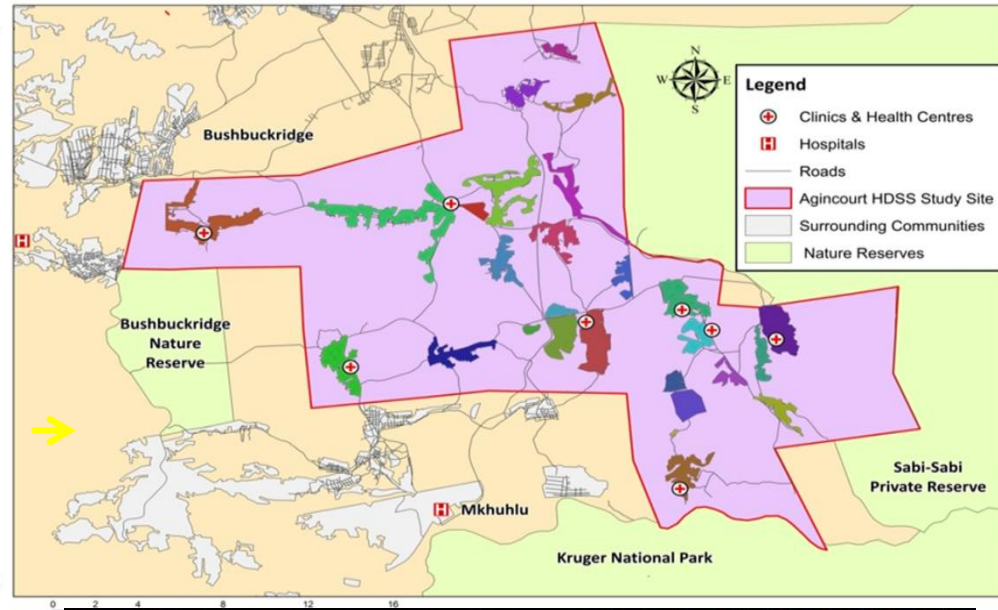
- To evaluate quality of care in the ICDM model

Study objectives:

- To assess satisfaction of patients and operational managers with the dimensions of care
- To assess the relationships between structure, process and outcome constructs as a measure of quality of care in the ICDM model using patient satisfaction scores



Study setting



115,000 people; in 60,000 h/holds
2 health Centers, 6 fixed clinics
2 hospitals 25 – 60 km away




Methodology

- Study setting
 - Bushbuckridge sub-district (38 PHC facilities: 17 ICDM model pilot facilities)
 - Seven ICDM model pilot facilities in the Agincourt HDSS
- Study design: Cross-sectional analytical
- Study population: Patients on treatment for the markers of chronic diseases in the study area


HYPERTENSION

Assess Advise Treat



Control BP to prevent stroke/heart attack


Advise



Assess at least every 5 years


HIV

Assess



Screen for TB


Treat



Start ART as soon as needed

DIABETES

Assess Advise Treat




Control BP to prevent stroke/heart attack

Assess Advise Treat



Control glucose to save eyes, kidneys, feet

Assess



Screen for complications

Theoretical framework

- Donabedian's theory used to evaluate the quality of care in the ICDM model
- Avedis Donabedian's theory for evaluating quality of health care
 - Relationships between structure, process and outcome constructs
 - Structure: Organizational resources needed to provide care e.g. drug supply
 - Process: Things done to and for the patient e.g. defaulter tracing
 - Outcome: Desired result of health care e.g. waiting time

Hypothesised pathways

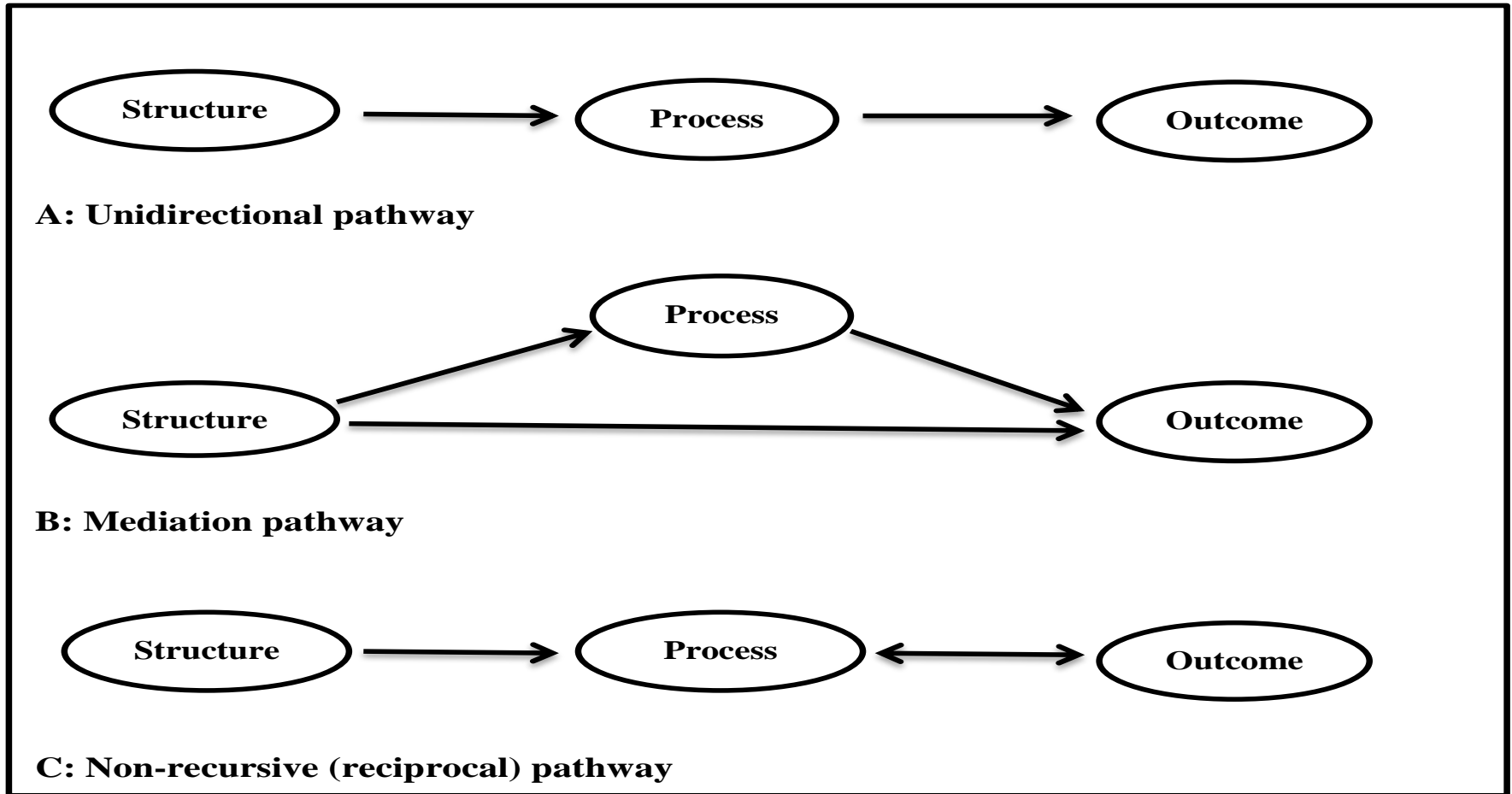


Figure 1: Pathways used to operationalize Donabedian's theory in the ICDM model

Dimensions of care

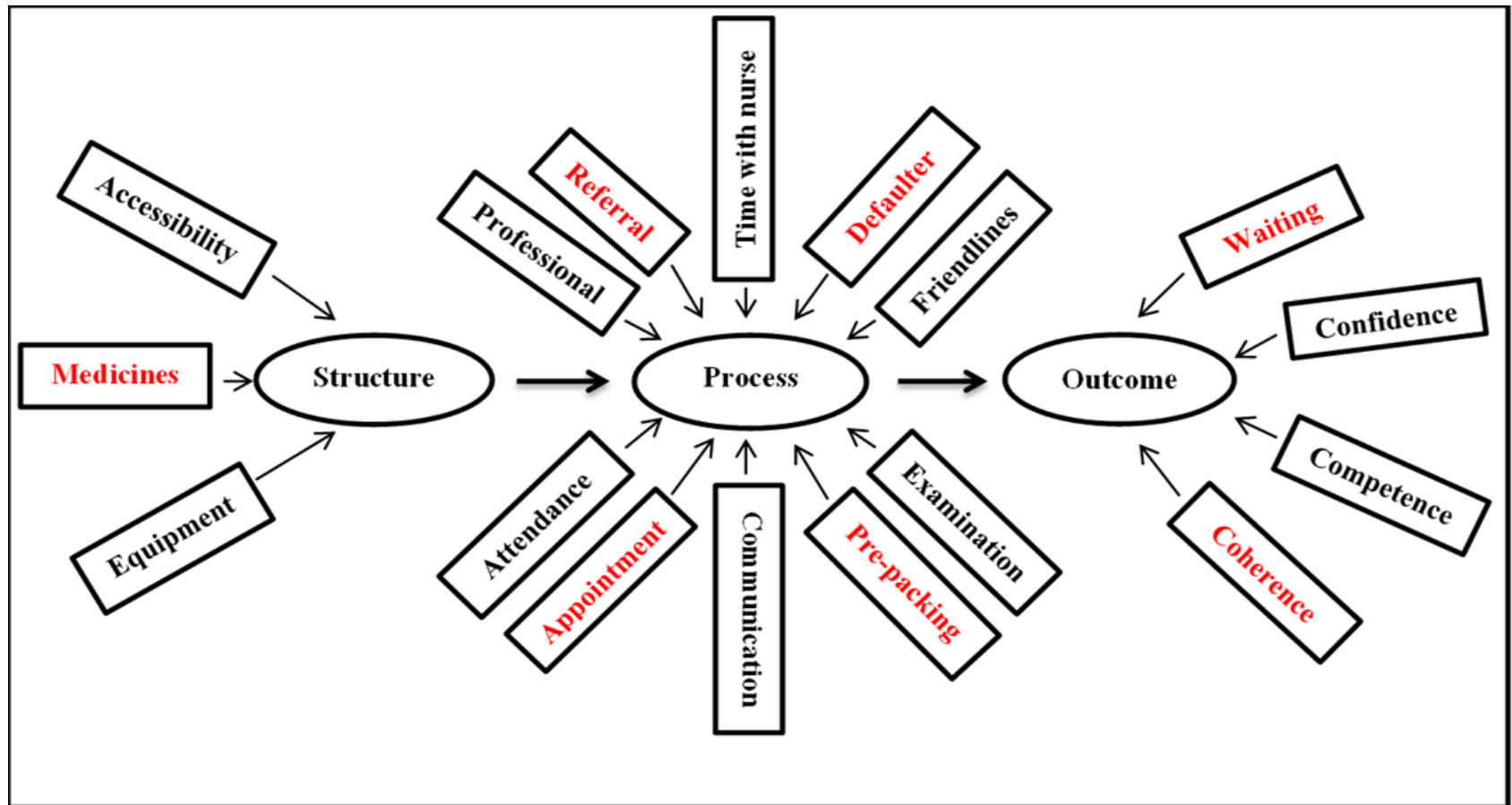


Figure 1: The dimensions of quality of care in the ICDM model

**Dimensions in red colour indicate the priority areas of the ICDM model*

Methodology

- Sample size determination:
 - Subjects-to-variable ratio (10:1) for studies using confirmatory factor analysis
 - 17 subjects for 22 variables (435 patients, adjusted for 10% non-response)

- Three-step sampling technique
 - Proportionate sampling to recruit patients in each facility
 - Patients in each facility stratified by HIV/AIDS, hypertension and diabetes
 - Systematic sampling used to recruit patients in each facility

- Inclusion criteria: Patients on treatment since January 2011, age ≥ 18 years

- Exclusion criteria: Minors (<18 years) and old people with diminished capacity for comprehension

- Operational managers of the seven facilities were interviewed

Methodology

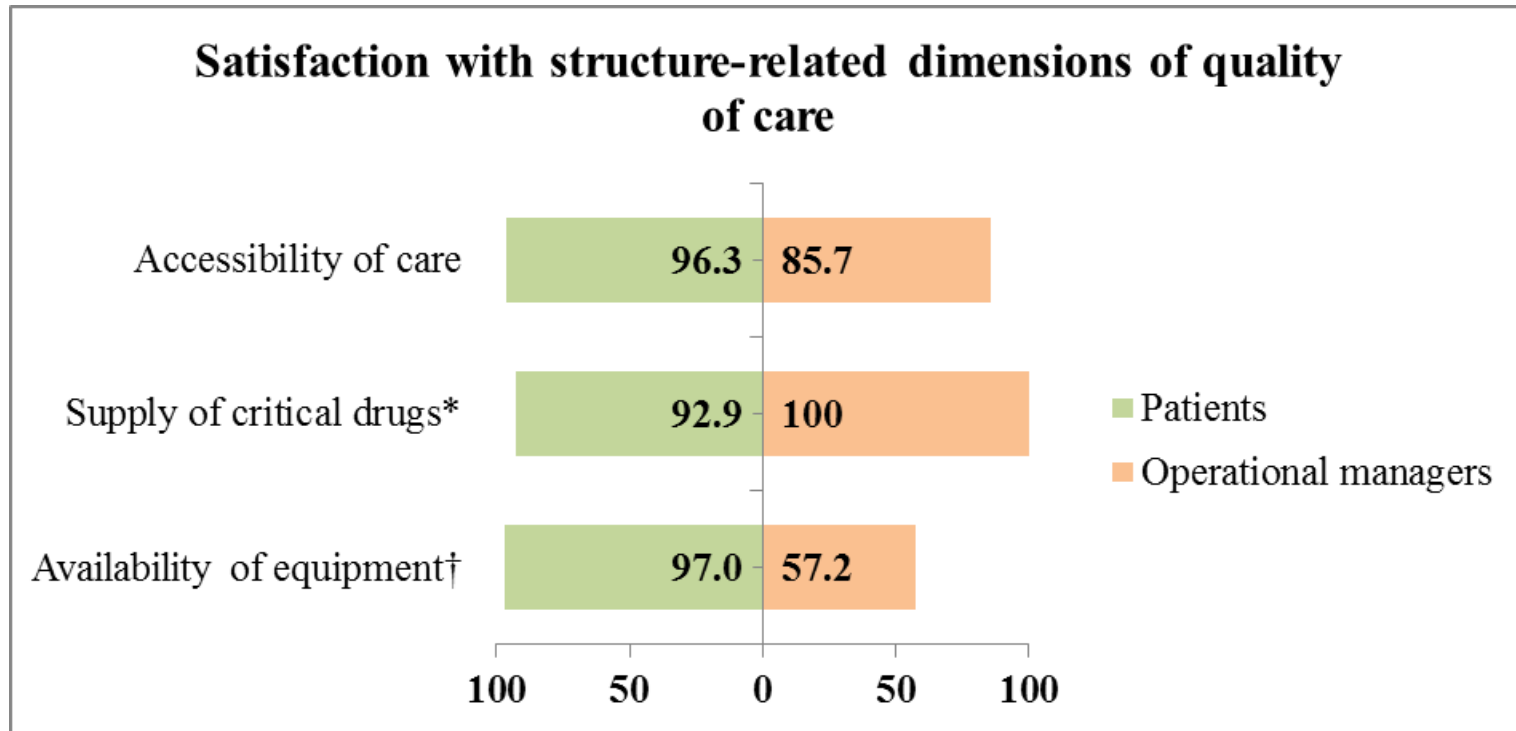
- Study instrument: Patient satisfaction questionnaire (PSQ-18)
 - Has multiple dimensions of care
 - Scored on a five-point Likert scale (strongly agree to strongly disagree)
- Operationalization of Donabedian's theory:
 - A priori identification of variables intended for SPO constructs
 - Respondents satisfied if the total relative frequency was $\geq 50\%$ for “strongly agree” and “agree”
 - Reliability of adapted PSQ was tested using Cronbach's alpha coefficient
 - Confirmatory factor analysis was (factor loadings ≥ 0.30)
 - Structural equation modelling was used to fit the specified pathways.
 - Model fit indices included:
 - Root Mean Squared Error of Approximation ($RMSEA \leq 0.06$ - good fit);
 - Comparative Fit Index (CFI) and Tucker-Lewis Index (TLI) (values > 0.90 - good fit);
 - Coefficient of Determination (CD close to 1 - good fit)
 - χ^2 p-value > 0.05 - good fit (not applicable if sample size > 400)
 - Stata 12 was used for statistical analysis (5% level of significance)

Results

Table 1: Socio-demographic characteristics of the study participants

Variable	Frequency (N=435)	Percentage
Age (years)		
18-29	23	5.3
30-39	69	15.8
40-49	68	15.6
50-59	88	20.3
60-80	187	43.0
Mean \pm SD (55 \pm 16.5); Median = 56		
Gender		
Female	354	81.4
Male	81	18.6
Education (years)		
No formal education	164	37.6
\leq 6	217	49.9
> 6	54	12.5
Type of grant		
None	91	20.9
Old age	299	68.7
Disability	44	10.1
HIV	1	0.3
Occupation		
Not presently working	431	99.0
Presently working	4	1.0
Nationality of origin		
South African	415	95.5
Mozambican	20	4.5
Chronic disease status		
Hypertension	231	53.1
HIV	151	34.7
Multiple conditions	49	11.3
Diabetes	4	0.9

Results

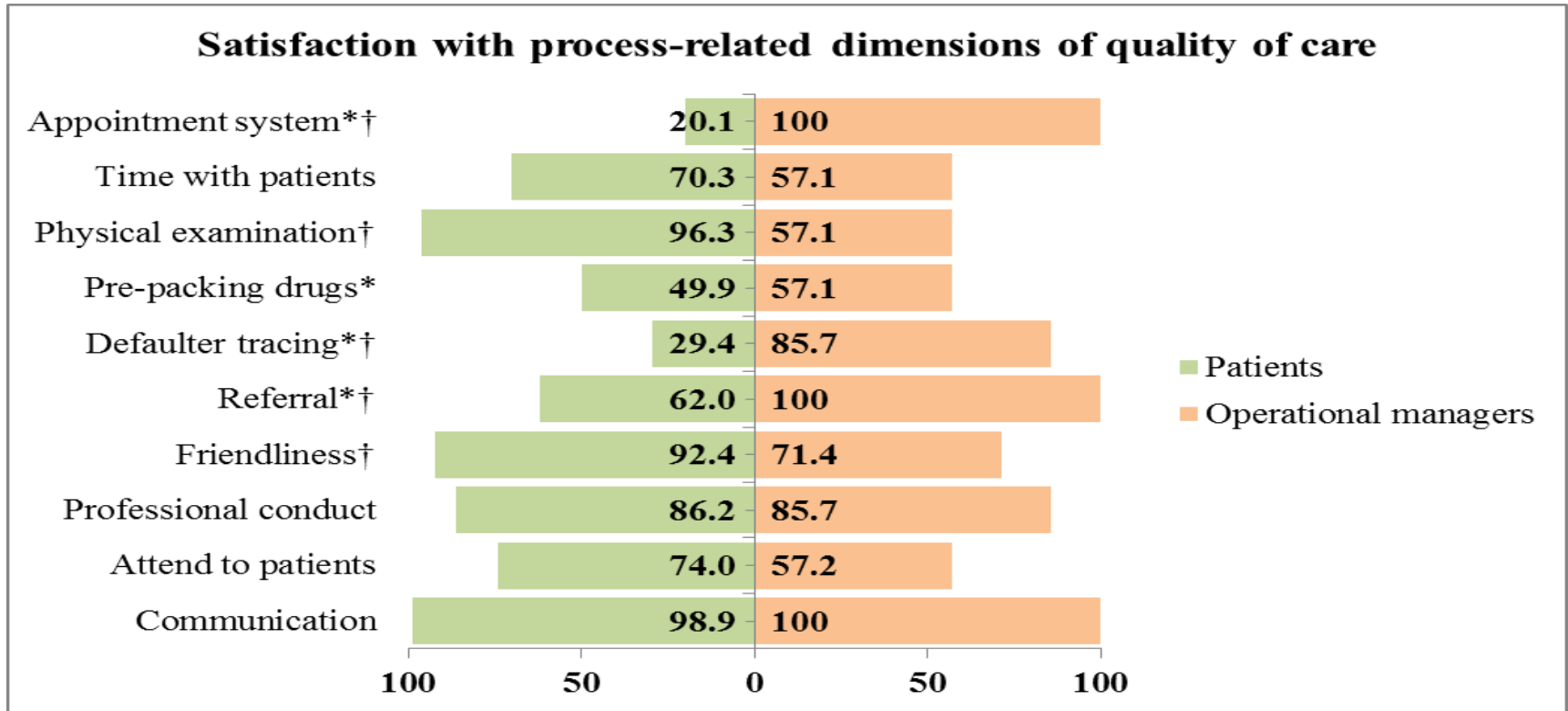


* *Priority dimensions of care in the ICDM model*

† *Statistically significant differences in the satisfaction scores of the patients and operational managers*

Figure 4: Satisfaction scores of the patients and operational managers with structure-related dimensions of care in the ICDM model

Results

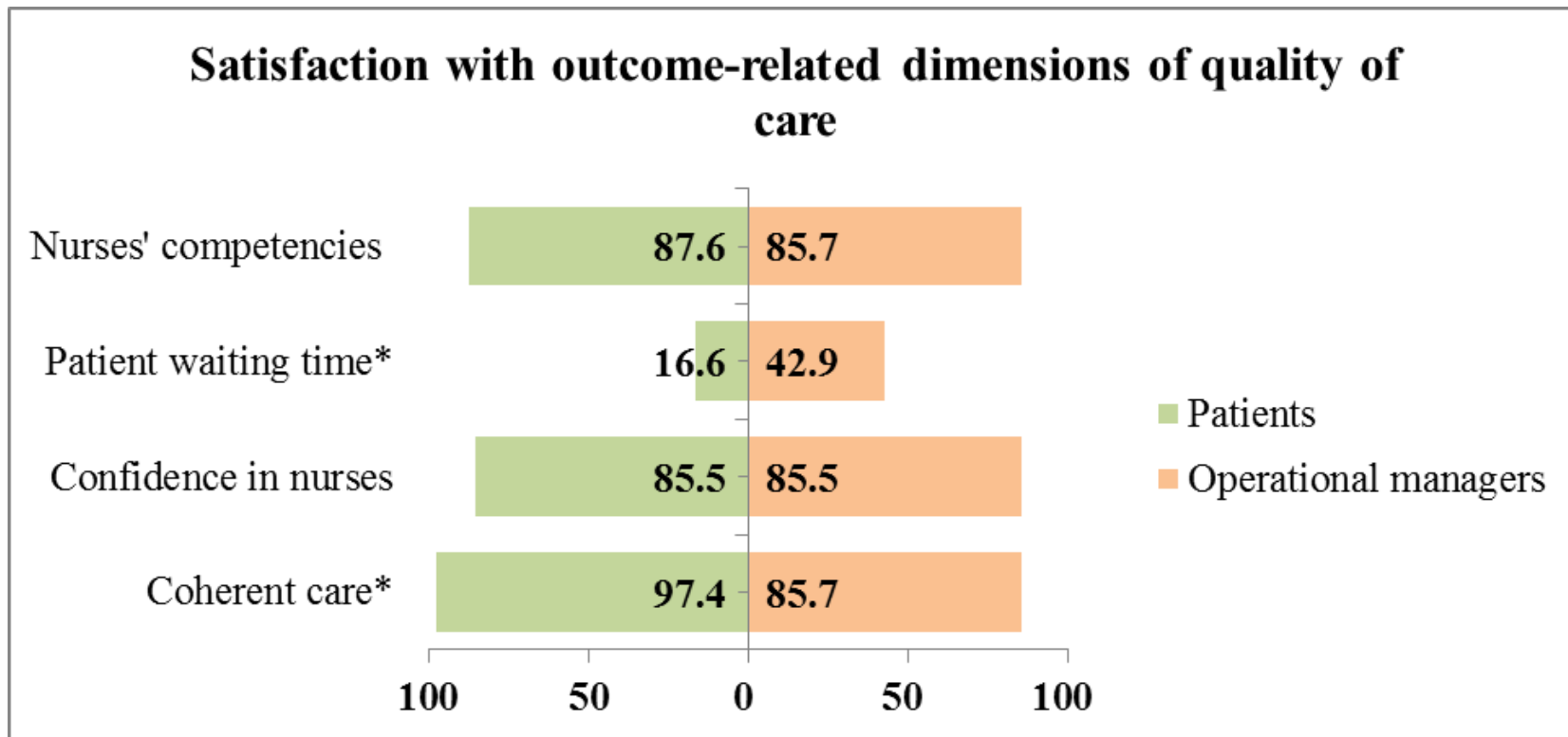


* Priority dimensions of care in the ICDM model

† Statistically significant differences in the satisfaction scores of the patients and operational managers

Figure 5: Satisfaction scores of the patients and operational managers with process-related dimensions of care in the ICDM model

Results



* *Priority dimensions of care in the ICDM model*

Figure 6: Satisfaction scores of the patients and operational managers with outcome-related dimensions of care in the ICDM model

Results

Table 2: The result of the goodness of fit of the specified pathways

Criteria	Specified pathways		
	Unidirectional	Mediation	Reciprocal
χ^2 test p value > 0.05*	P<0.001	P<0.001	P<0.001
RMSEA value \leq 0.06	0.064 (90% CI - 0.052-0.077)	0.058 ✓ (90% CI - 0.045-0.070)	0.059 ✓ (90% CI - 0.047-0.070)
CFI \geq 0.90	0.915 ✓	0.931 ✓	0.919 ✓
TLI \geq 0.90	0.892	0.913 ✓	0.910 ✓
CD close to 1.00 (perfect fit is preferred if CD value=1.00)	0.911 ✓	1.00 ✓	0.632
Ranking	3 rd	1 st	2 nd

* χ^2 test p value was not used as a criterion for judging model fit – sample size >400

Results

RMSEA = 0.058 (90% CI: 0.045 - 0.070); CFI = 0.931; TLI = 0.913; CD=1.000

$\chi^2 [52] = 127, p < 0.001$

Composite reliability: structure = 0.790; process = 0.702; outcome = 0.600

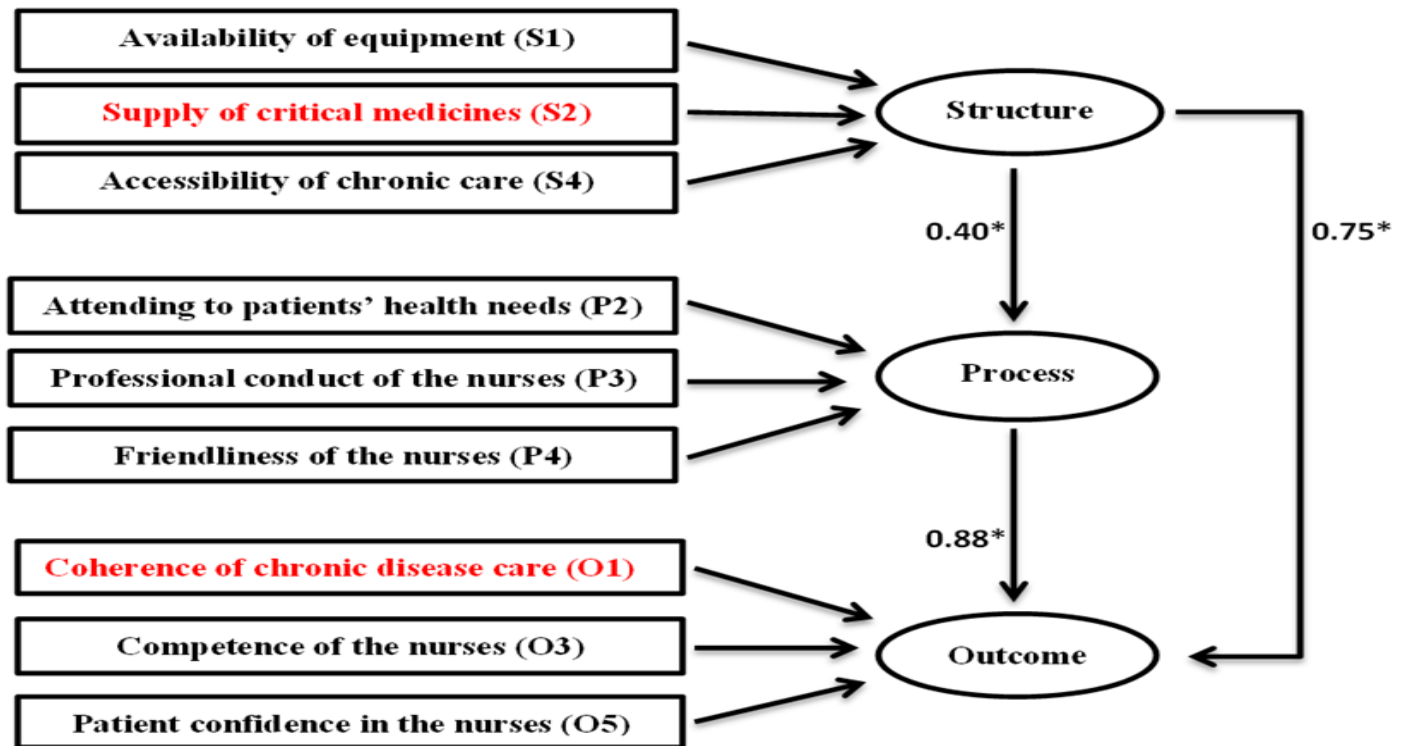


Figure 7: Goodness-of-fit, reliability and correlation assessments

Summary/policy implications

- Operational managers reported satisfaction with 16 dimensions of care
- Patients reported satisfaction with 14 dimensions of care
- Operational managers and patients were dissatisfied with patient waiting time
- Of the seven priority areas, **availability of medicines** and **coherent care** were significantly associated with good quality of care
- Strengthen services in:
 - **Referral**
 - **Defaulter tracing**
 - **Prepacking of medicines**
 - **Appointments**
 - **Patient waiting time**
- Structure correlated with process and outcome. Independent of structure, process correlated with outcome
- Large scale study needed in PHC facilities in semi-urban and urban areas



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