

# **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 6<sup>th</sup> 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:

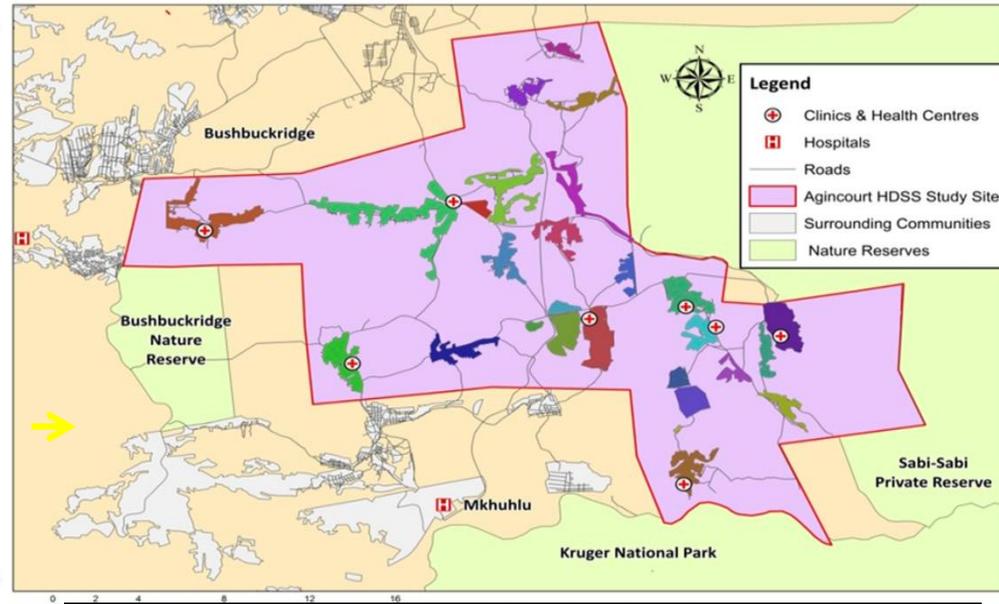
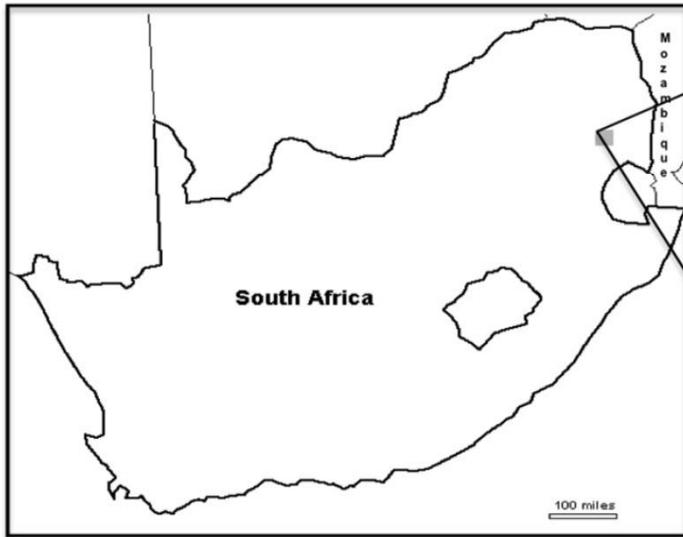
- To evaluate quality of care in the ICDM model

## Study objectives:

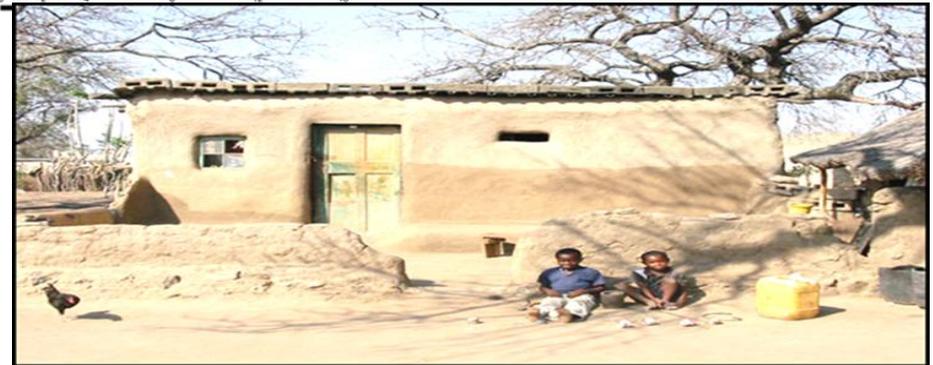
- To assess satisfaction of patients and operational managers with the dimensions of care
- To assess the relationships between structure, process and outcome constructs as a measure of quality of care in the ICDM model using patient satisfaction scores



# 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

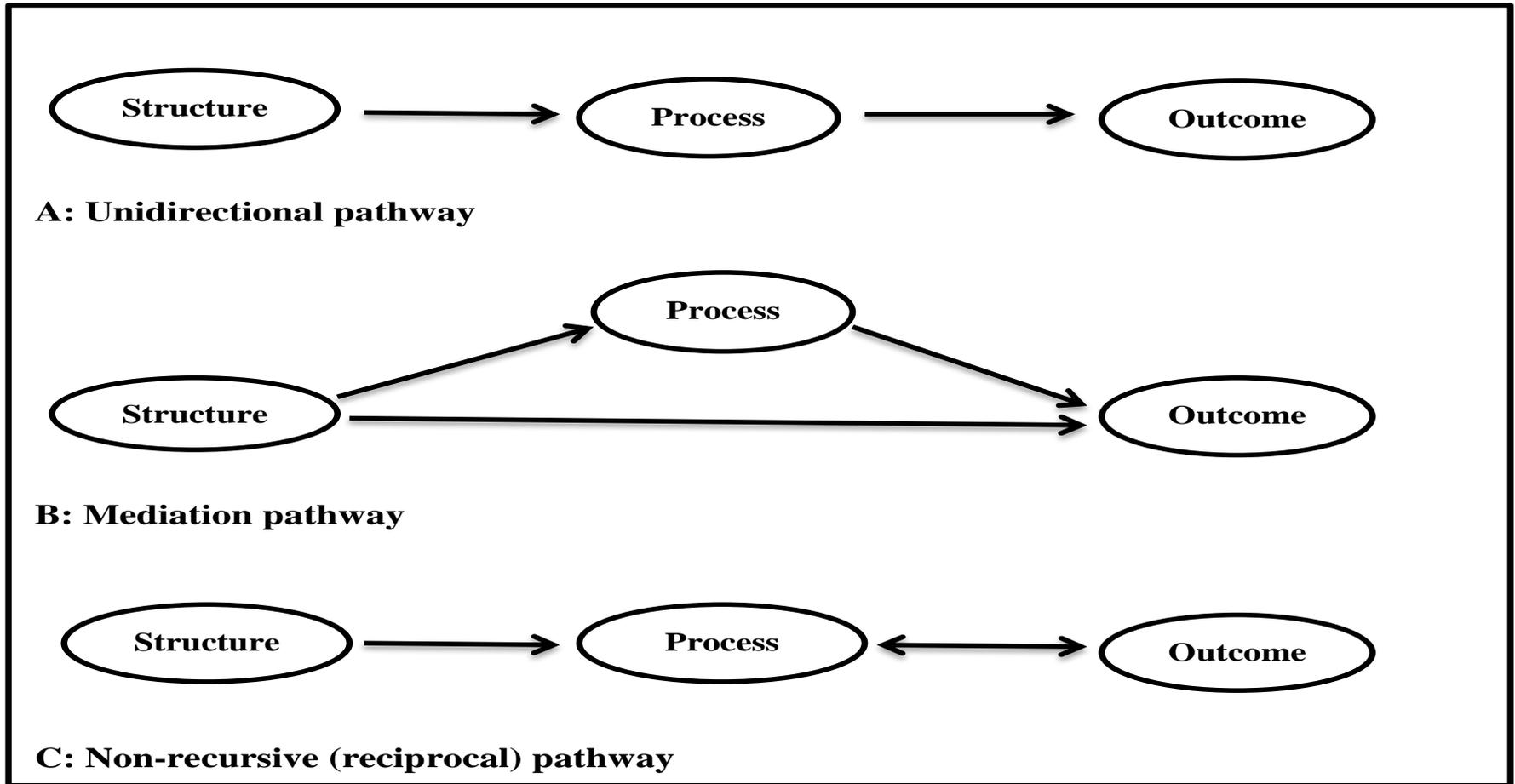


Figure 1: Pathways used to operationalize Donabedian's theory in the ICDM model

# Dimensions of care

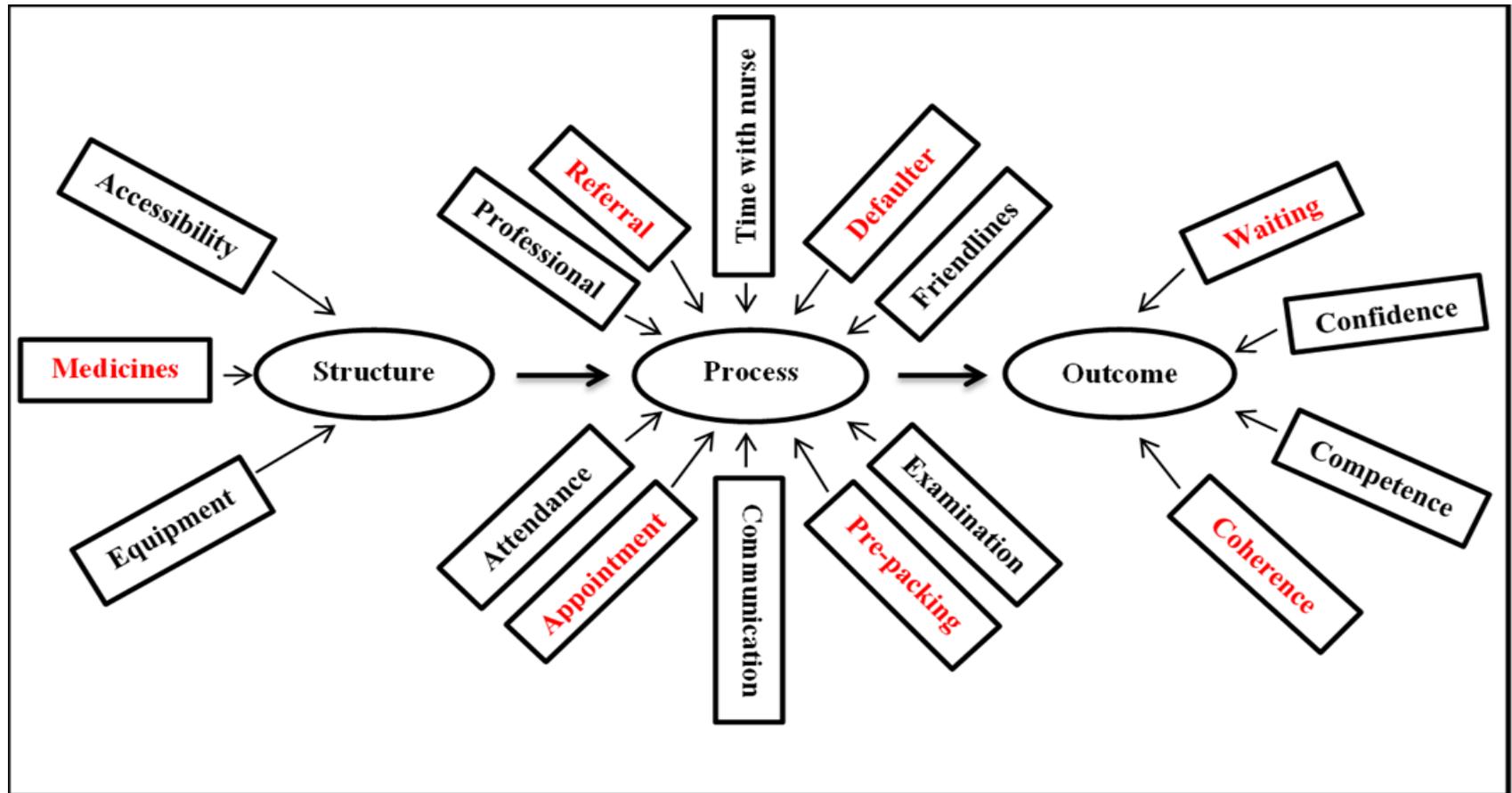


Figure 1: The dimensions of quality of care in the ICDM model

*\*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  $\geq 18$  years
  
- Exclusion criteria: Minors (<18 years) and old people with diminished capacity for comprehension
  
- Operational managers of the seven facilities were interviewed

# Methodology

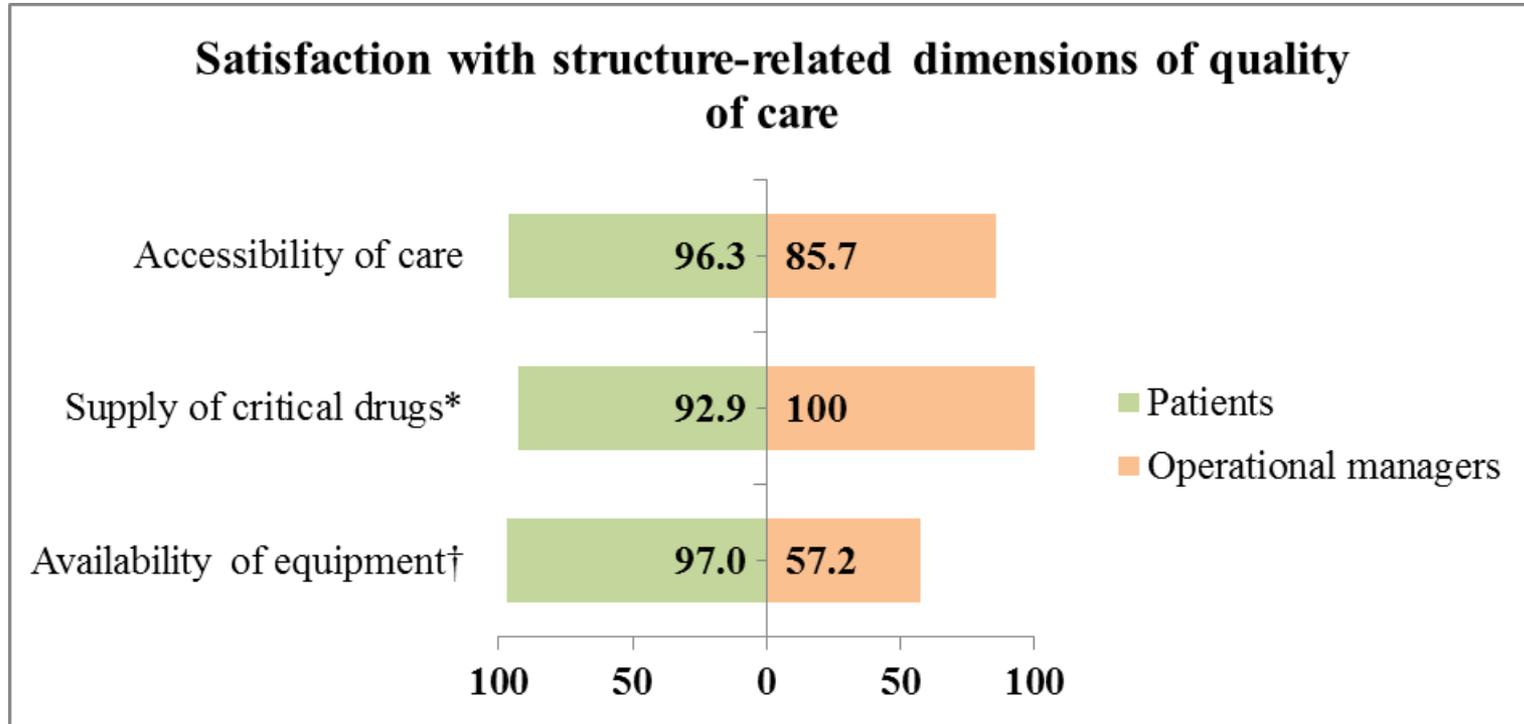
- Study instrument: Patient satisfaction questionnaire (PSQ-18)
  - Has multiple dimensions of care
  - Scored on a five-point Likert scale (strongly agree to strongly disagree)
- Operationalization of Donabedian's theory:
  - A priori identification of variables intended for SPO constructs
  - Respondents 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  $\geq 0.30$ )
  - 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)
    - $\chi^2$  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
<b>Age (years)</b>		
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 ± SD (55 ± 16.5); Median = 56		
<b>Gender</b>		
Female	354	81.4
Male	81	18.6
<b>Education (years)</b>		
No formal education	164	37.6
≤ 6	217	49.9
> 6	54	12.5
<b>Type of grant</b>		
None	91	20.9
Old age	299	68.7
Disability	44	10.1
HIV	1	0.3
<b>Occupation</b>		
Not presently working	431	99.0
Presently working	4	1.0
<b>Nationality of origin</b>		
South African	415	95.5
Mozambican	20	4.5
<b>Chronic disease status</b>		
Hypertension	231	53.1
HIV	151	34.7
Multiple conditions	49	11.3
Diabetes	4	0.9

# Results

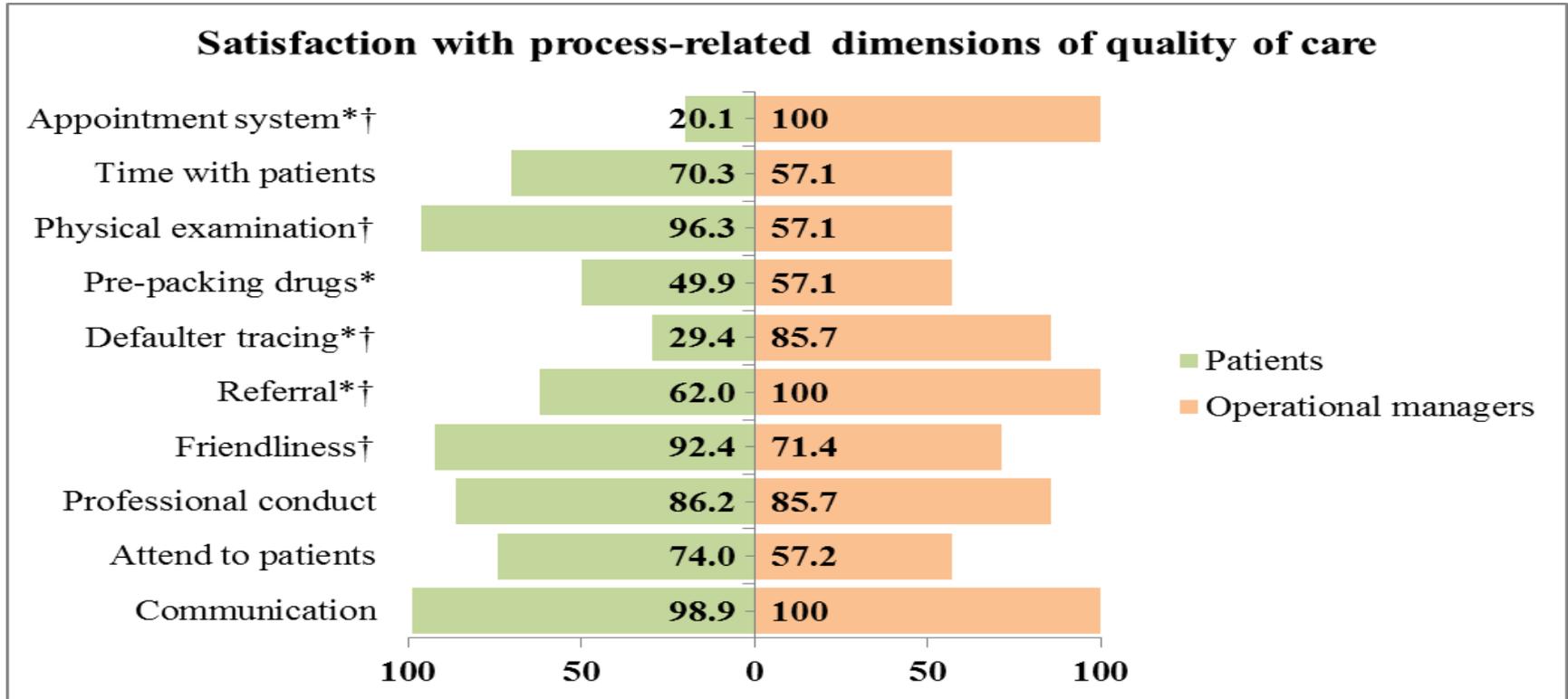


\* *Priority dimensions of care in the ICDM model*

† *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

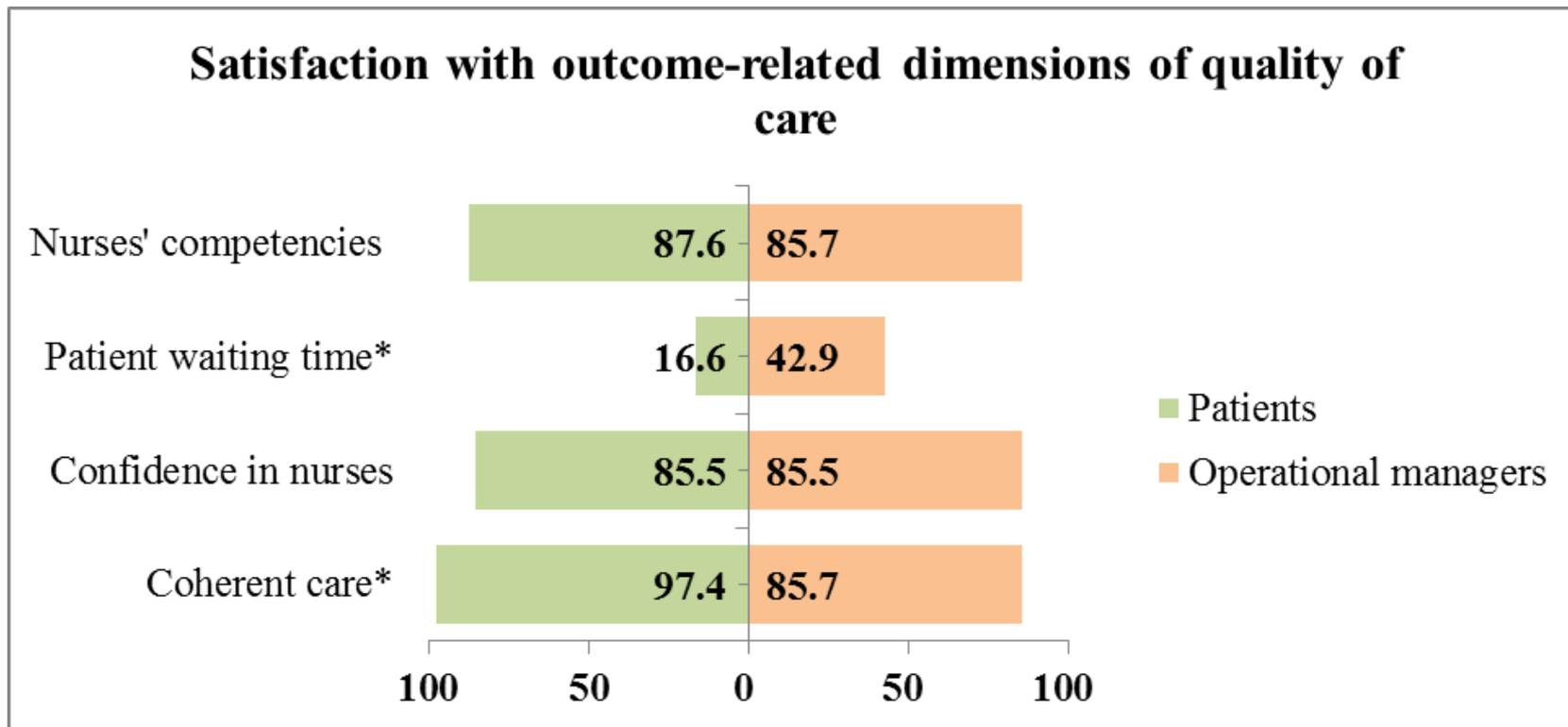


\* Priority dimensions of care in the ICDM model

† 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
$\chi^2$ 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 <sup>rd</sup>	1 <sup>st</sup>	2 <sup>nd</sup>

\*  $\chi^2$  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

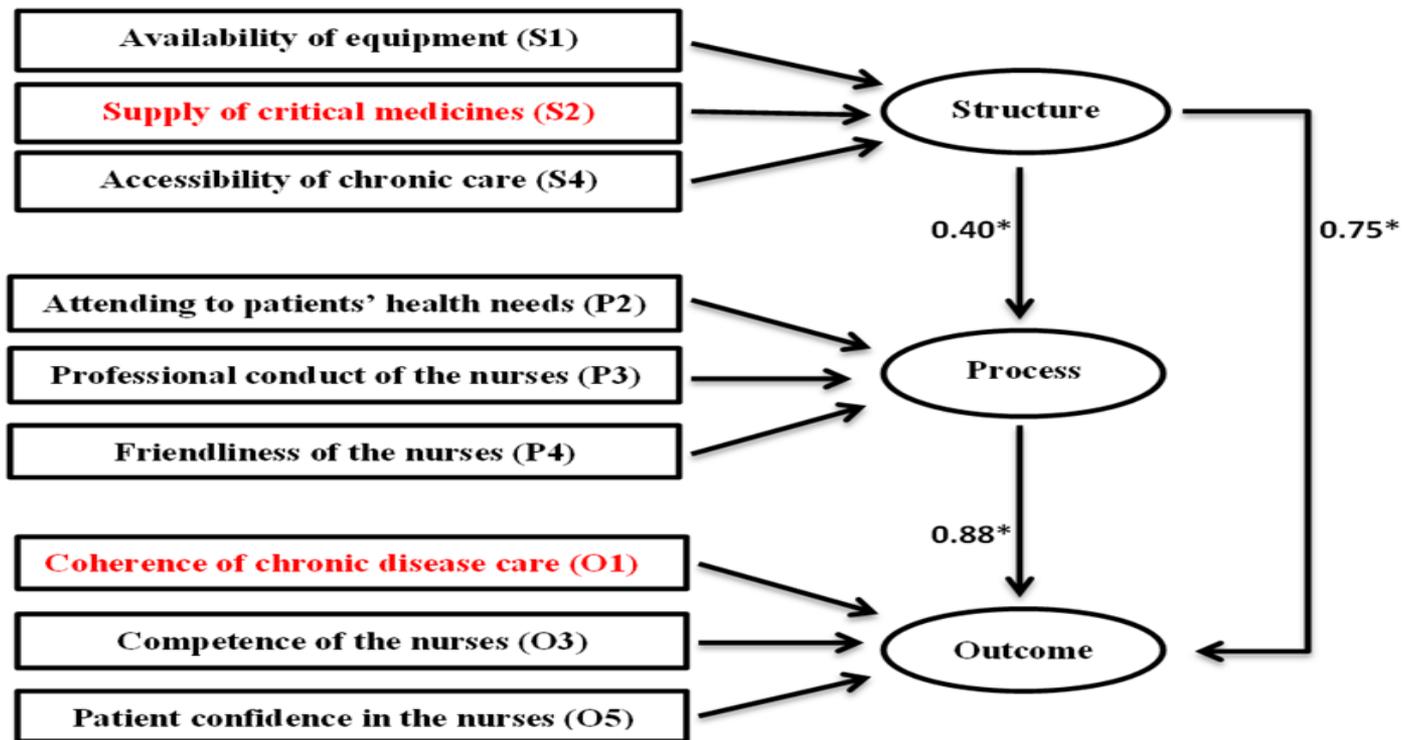


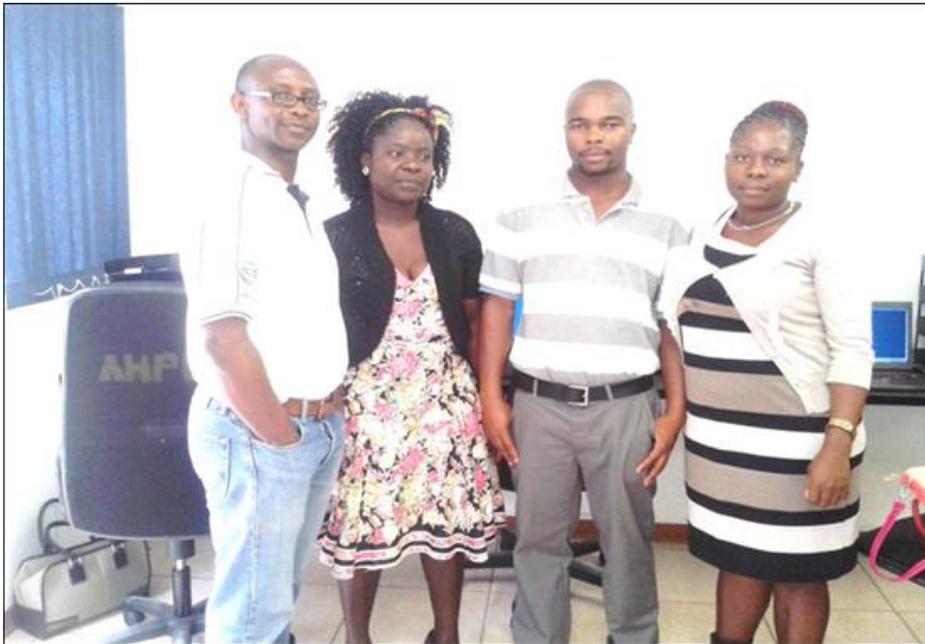
Figure 7: Goodness-of-fit, reliability and correlation assessments

# Summary/policy implications

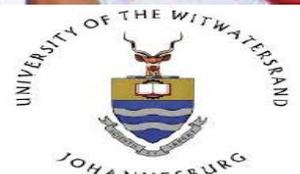
- Operational managers reported satisfaction with 16 dimensions of care
- Patients reported satisfaction with 14 dimensions of care
- Operational managers and patients were dissatisfied with patient waiting time
- Of the seven priority areas, **availability of medicines** and **coherent care** were significantly 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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Thank you for listening

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