



**PREDICTORS OF STAFF
SATISFACTION IN THE BUILT
ENVIRONMENT IN LONG-TERM
CARE FACILITIES**

Post-occupancy evaluation studies | Eliane Schreuder, MSc. & Charelle Bottenheft, MSc.

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AGENDA

- › About TNO

- › Predictors of staff satisfaction in the built environment
 - › Background
 - › Aim
 - › Method
 - › Findings
 - › Discussion

ABOUT TNO

“TNO connects people and knowledge to create innovations that boost the sustainable competitive strength of the industry and the well-being of society”

TNO: INNOVATION FOR LIFE

INDUSTRY



HEALTHY LIVING



DEFENSE, SAFETY & SECURITY



URBANISATION



ENERGY



DUTCH CENTRE FOR HEALTH ASSETS (DUCHA)

- › Healthcare infrastructure
- › Research, knowledge dissemination and consultancy
- › Sustainable healthcare buildings in terms of:
 - › Safety, well-being, efficiency, costs and sustainability.
- › Age friendly environments

TITEL: EXPLORATION OF PREDICTORS OF STAFF SATISFACTION IN THE BUILT ENVIRONMENT IN LONG-TERM CARE FACILITIES

› Authors: Eliane Schreuder, Charelle Bottenheft & Anjali Kuldip Singh

BACKGROUND

- › Influence of the building design on the well-being of the users
- › In particular research on patients in the healthcare building (Dijkstra, 2006)
- › Focus on both patients and healthcare staff
- › Cochrane review (Dijkstra & Pieterse, 2011): “Very limited evidence in support of the idea that architectural interventions in the physical healthcare environment affect healthcare personnel”

BACKGROUND

- › Gain more understanding of the impact of the building design on user outcomes: conducting post-occupancy evaluations (POE's)
- › POE's: assess how well the building performs compared with the design objectives and to feed forward the knowledge gained into new design.
- › Ambition DuCHA: predict performance of building already in design phase



BACKGROUND



Nursing home Z

- Psychogeriatric (108)
- Somatic (64)
- Small scale units/large facility



Nursing home W

- Somatic (18)
- Individual apartments including care services



Nursing home I

- Psychogeriatric (56)
- Somatic (34)
- Mentally disabled (6)
- Small scale units/large facility

MAIN AIM

- › Determine which design factors of the built environment in nursing homes contribute the most to staff satisfaction with the building.
- › Explore whether the hierarchy of predictors differ per nursing home or whether a more generic hierarchy of predictors exists.



OVERALL METHOD

- › Questionnaire
- › Factor analysis (design factors)
- › Regression analysis: effect of design factors on staff satisfaction

QUESTIONNAIRE

- › 3 POE studies for three nursing homes (building I, W and Z)
- › Questionnaire: 5 demographical items, 67 statements about the evaluation of the building (agree or disagree on a 5-point Likert-scale)
- › Outcome measure: overall staff satisfaction with the building (10-point scale)
- › N = 314 cases (staff and volunteers)
 - › 35 from building I
 - › 15 from building W
 - › 264 from building Z

FACTOR ANALYSIS

- › Principal Component Analysis (PCA): reduce number of items and group them into reliable and meaningful components
- › Reliable components were used as design factors
- › After reliability analysis: **15 building design factors** (independent variables)

The table displays a matrix of data points, likely correlation coefficients or factor loadings, used in a Principal Component Analysis. The rows and columns represent various variables and components. A significant portion of the table is highlighted in yellow and green, indicating the predictors of staff satisfaction.

DESIGN FACTORS

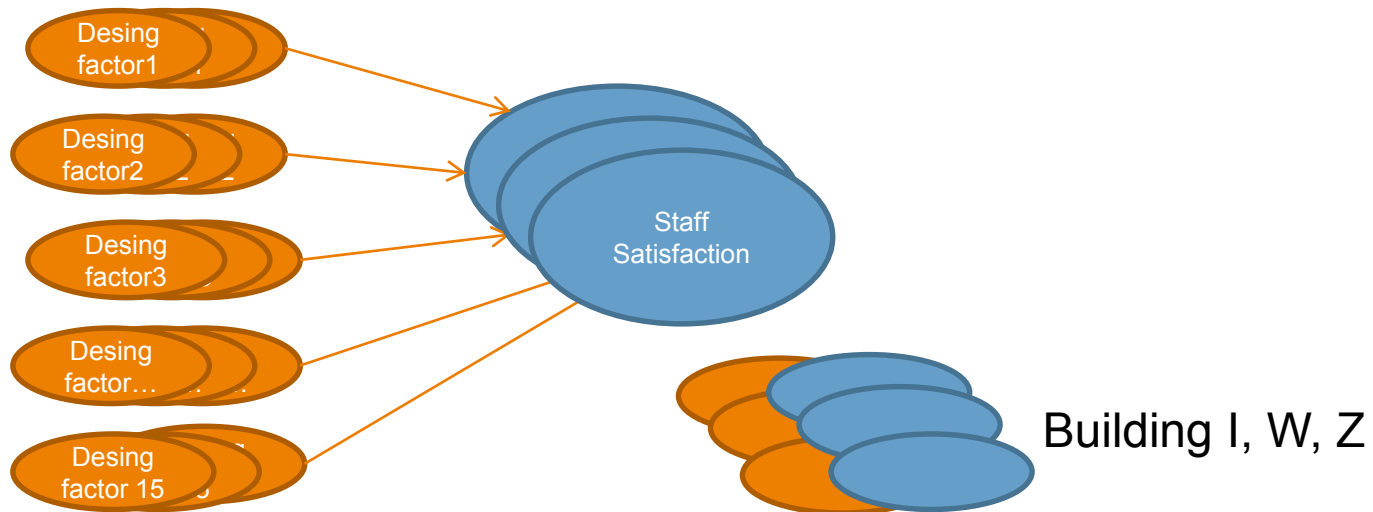
Factor	# questions	Explanation of the factor	Cronbach's Alpha
Façade design	5	architecture; entrance; fit with environment; façade colors & materials	.89
Ambiance	7	used colors and materials; interior design; (day)light.	.84
Indoor climate	5	(control of) temperature, ventilation, odors.	.79
View/light	2	views; contact with outside	.72
Noise	3	Noise	.69
Functionality for clients	9	quantity, spacing and quality of client rooms, bathrooms, living room; furnishing flexibility.	.92
Functionality for staff	7	fit for purpose: building & equipment; staff sanitary; staff privacy; space to meet colleagues.	.83
Building at nighttime	3	comfort working at night, lighting at night	.86
Safety	4	escape routes; accessibility of support; perception of safety;	.70
Accessibility	3	wheelchair friendliness	.64
Facilities	4	facilities (e.g. shops) in the building and in the vicinity; elevators.	.69
Room for activities	3	outside space; inside space for activities; storing space.	.72
Orientation	5	travel distances; orientation for visitors; overview, light in corridors	.74
Access to the building	1	Accessible building (e.g transport)	N.A.
Green environment	1	Green environment	N.A.

DATA ANALYSIS

- › Regression analysis: which design factor contribute the most to staff satisfaction?

Independent
variables

Dependent/
outcome variable



RESULTS REGRESSION ANALYSES

Factor	Simple regression	Generic effect (multiple regression)	Context dependent effect (interaction)
Façade design	$p < .001$	$p < .001$ (standardized B = .346)	
Ambiance	$p < .001$	$p = .002$ (standardized B = .236)	
Indoor climate	$p < .001$		
View/light	$p < .001$		
Noise	$p < .001$		
Functionality for clients	$p = .007$		
Functionality for staff	$p < .001$	$p = .001$ (standardized B = .244)	
Building at nighttime	$p = .049$		
Safety	$p < .001$		
Accessibility	$p < .001$		
Facilities	$p < .001$		
Room for activities	$p < .001$		
Orientation	$p < .001$		
Access to the building	$p = .030$		

CONCLUSIONS

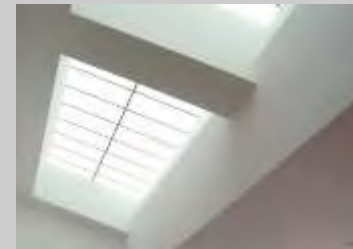
Façade design



Functionality for staff



Ambiance



DISCUSSION

- › Insights in generic design factors that are most valued by the nursing staff
- › It indicates areas to prioritize design decisions
- › Strength study: integration of three POE's
- › Further research
 - › What interventions in the façade, ambiance and functionality achieve an increase in staff satisfaction?
 - › Relation between satisfaction with the building and overall (job) satisfaction
 - › Optimized design for clients & staff



THANK YOU FOR YOUR ATTENTION

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