Modeling and managing the patients' need for clinical care: Enhancing evidence-based practice and management
van Oostveen, C.J.

Citation for published version (APA):

General rights
It is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), other than for strictly personal, individual use, unless the work is under an open content license (like Creative Commons).

Disclaimer/Complaints regulations
If you believe that digital publication of certain material infringes any of your rights or (privacy) interests, please let the Library know, stating your reasons. In case of a legitimate complaint, the Library will make the material inaccessible and/or remove it from the website. Please Ask the Library: http://uba.uva.nl/en/contact, or a letter to: Library of the University of Amsterdam, Secretariat, Singel 425, 1012 WP Amsterdam, The Netherlands. You will be contacted as soon as possible.
MODELING AND MANAGING the patients’ need for clinical care

ENHANCING EVIDENCE-BASED PRACTICE AND MANAGEMENT

CATHARINA VAN OOSTVEEN

Catharina Jacoba van Oostveen was born in Breukelen, The Netherlands on October 10th 1982. After finishing secondary school in 2000, she graduated Nursing school in 2004 at the University of applied sciences in Amsterdam, the Amsterdam School of Health Professions. Then her clinical career started at a nursing ward for Gastro-Intestinal surgery at the Academic Medical Center in Amsterdam. She became a medium care nurse for the Surgical medium care in 2006 and was appointed ‘senior nurse’ in 2008, focussing on quality improvement and innovation.

During her clinical career in 2008, she started her Masters in Nursing Science at the University of Utrecht, which she completed in 2010. Her Master thesis was the start of her PhD programme “Modeling and managing the patients’ need for clinical care”. Here, she focused on patients’ demand for healthcare services on strategic, (i.e. hospital costs) tactical and operational level (i.e. budget planning and staffing resources).

Throughout this period she became a supporter of nursing professionalization and interprofessional collaboration as it became clear that these issues are very important in managing the demand and quality of patient care.

In the future, she will remain active in research on outcomes of nursing care, nursing professionalization and interprofessional collaboration. Also, she wishes to integrate both clinical and academic work in her career and hopes to be a role model for the clinical academic nurse, ultimately to improve quality, safety and efficiency of clinical practice.

Catharina is, next to nurse and scientist, married to Ewoud Willem van Os and mother of two sons Quinten (2005) and Olivier (2011).
Uitnodiging

Voor het bijwonen van de openbare verdediging
van het proefschrift

MODELING AND MANAGING
the patients’ need for clinical care
ENHANCING EVIDENCE-BASED
PRACTICE AND MANAGEMENT

Op vrijdag 20 februari 2015 om 11:00 uur in de
aula van de Universiteit van Amsterdam, Oude
Lutherse kerk, Singel 411 (hoek Spui) te Amster-
dam. Receptie na afloop van de promotie aldaar.

Catharina van Oostveen

Hoge Rijndijk 4-26
3449 HA Woerden
catharinavanoostveen@hotmail.com
T 06 48945529

Paranimfen

André Sterk
A.L.Sterk@amc.nl
Marian Mens
M.A.Mens@amc.nl
MODELING AND MANAGING

the patients’ need for clinical care

ENHANCING EVIDENCE-BASED PRACTICE AND MANAGEMENT

ACADEMISCH PROEFSCHRIFT

ter verkrijging van de graad van doctor aan de Universiteit van Amsterdam op gezag van de Rector Magnificus prof. dr. D.C. van den Boom ten overstaan van een door het college voor promoties ingestelde commissie, in het openbaar te verdedigen in de Aula der Universiteit op vrijdag 20 februari 2015, te 11:00 uur

COLOFON

Modeling and managing the patients’ need for clinical care, Enhancing evidence-based practice and management
PhD Thesis, University of Amsterdam, The Netherlands

Design & Layout Ilse Schrauwers - www.isontwerp.nl
Printed by Gildeprint - www.gildeprint.nl
ISBN 978-94-6108-858-1

Part of the research described in this thesis was financially supported by ZonMW (the Dutch organization of health research and development).
Printing of this thesis was financially supported by the Department of Surgery and the Department of Quality Assurance and Process Innovation, Academic Medical Center at the University of Amsterdam.

©2015, CJ van Oostveen, Amsterdam, The Netherlands
All rights reserved. No part of this publication may be reproduced or transmitted in any form by any means, without written permission of the author. A digital version of this thesis can be found at www.catharinavanoostveen.nl or by using the QR code.

door

Catharina Jacoba van Oostveen
geboren te Breukelen
### Promotiecommissie

**Promotores**
- Prof. dr. PJM Bakker
- Prof. dr. DJ Gouma

**Co-promotores**
- Dr. H Vermeulen
- Dr. DT Ubbink

**Overige leden**
- Prof. dr. J Kievit
- Prof. dr. DA Legemate
- Dr. EJM Nieveen van Dijkum
- Dr. L Schoonhoven
- Prof. dr. K Stronks
- Prof. dr. PF Roodbol

---

Faculteit der Geneeskunde

---

**Aan mijn allerliefsten**
# Table of Contents

## Part I Demand for Care

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Title</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Factors and models associated with the amount of healthcare services as demanded by hospitalized patients: A systematic review</td>
<td>21</td>
</tr>
<tr>
<td>3</td>
<td>Explaining the amount of care needed by hospitalised surgical patients: A prospective time and motion study</td>
<td>61</td>
</tr>
<tr>
<td>4</td>
<td>Quantifying the demand of healthcare services: A time and motion study</td>
<td>81</td>
</tr>
</tbody>
</table>

## Part II Patient Care Intensity

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Title</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Factors determining the patients’ care intensity for surgeons and surgical nurses: A conjoint analysis</td>
<td>105</td>
</tr>
<tr>
<td>6</td>
<td>Nurse staffing issues are just the tip of the iceberg: A qualitative study about nurses’ perceptions of nurse staffing</td>
<td>121</td>
</tr>
</tbody>
</table>

## Part III Staffing on Clinicalwards

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Title</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>Pre-implementation studies of a workforce planning tool for nurse staffing and human resource management in university hospitals</td>
<td>145</td>
</tr>
<tr>
<td>8</td>
<td>Developing and testing a computerized decision support system to improve efficiency and nurses’ satisfaction of daily nurse-patient assignment in hospitals: A multimethod study</td>
<td>163</td>
</tr>
<tr>
<td>9</td>
<td>SUMMARY AND FUTURE CHALLENGES: Samenvatting en Toekomstige uitdagingen</td>
<td>185</td>
</tr>
</tbody>
</table>

## Appendices

<table>
<thead>
<tr>
<th>Page</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>212</td>
<td>PhD Portfolio</td>
</tr>
<tr>
<td>216</td>
<td>Publications</td>
</tr>
<tr>
<td>218</td>
<td>Acknowledgements (Dankwoord)</td>
</tr>
</tbody>
</table>