http://researchspace.auckland.ac.nz

ResearchSpace@Auckland

Copyright Statement

The digital copy of this thesis is protected by the Copyright Act 1994 (New Zealand).

This thesis may be consulted by you, provided you comply with the provisions of the Act and the following conditions of use:

- Any use you make of these documents or images must be for research or private study purposes only, and you may not make them available to any other person.
- Authors control the copyright of their thesis. You will recognise the author's right to be identified as the author of this thesis, and due acknowledgement will be made to the author where appropriate.
- You will obtain the author's permission before publishing any material from their thesis.

To request permissions please use the Feedback form on our webpage.
http://researchspace.auckland.ac.nz/feedback

General copyright and disclaimer

In addition to the above conditions, authors give their consent for the digital copy of their work to be used subject to the conditions specified on the Library Thesis Consent Form.
Using the Common-Sense Model of Self-Regulation to Explore the Factors Associated with Intentional Non-Adherence to Preventer Medication for Asthma

Jodie Jane Main

A thesis submitted in partial fulfilment of the requirements for the Degree of Doctor of Philosophy in Health Psychology

The University of Auckland
December 2007
Abstract

Daily use of inhaled preventer medication is recommended for most people with asthma. However, research suggests many do not adhere to this regime. The current thesis comprises two research studies utilising the common-sense model of self-regulation as the theoretical basis to explore how people make decisions about inhaled preventer use in asthma.

The purpose of Study One was to compare a self-report and an objective measure of adherence to preventer medication for asthma and to examine the illness representations and treatment beliefs associated with these measures. Accordingly, 1,936 U.K. General Practice patients who were using preventer medication for asthma completed a questionnaire assessing illness and medication perceptions and gave consent for information to be obtained from their medical records. Adherence to preventer medication was calculated from the Medication Adherence Report Scale (MARS) and an objective measure, the proportion of prescribed medication that the participant collected over the previous year. Results show that nearly nine out of ten participants (88.4%) reported some non-adherence to their preventer medication. The most common form of non-adherence was using preventer inhaler only when feeling breathless. The relationships between participants' representations of their asthma and their beliefs about their preventer medication and adherence measures were tested using structural equation modelling. Seeing asthma as a condition that was not present when asymptomatic was associated with more non-adherence ($\beta=.22 \ p<.001$) and also with collecting a smaller proportion of prescribed preventer medication over the past year ($\beta=-.15, \ p<.001$). Seeing asthma as an acute condition, as a condition without serious consequences, and as a condition that could not be controlled by treatment were also representations associated with non-adherence. Those who did not see the need for preventer medication at all, or did not see the need for preventer medication when asymptomatic were more likely to be non-adherent. The relationship between illness representations and self-report adherence was mediated by the belief that medication was necessary.

Having identified a number of key beliefs that were associated with use of preventer medication in asthma, Study Two explored the way in which these beliefs may be developed through the process of appraisal of the influence of medication use on symptom experience. Using quantitative methods, 77 patients from a New Zealand General Practice completed a questionnaire measuring the reasons for experimenting and stopping medication, illness representations and treatment beliefs. Thirty percent of the sample reported actively experimenting with their medication. These participants were more likely to hold the belief that medication did not help in the absence of symptoms (Mann-Whitney U=343.5, $p<.05$) and to report trying to avoid thinking about asthma (Mann-Whitney U=330.5, $p<.05$). Fifty-one of the participants were subsequently interviewed about their experiences with using medication and
transcripts of these interviews were subjected to a qualitative analysis. Participants’ responses suggested that the process of appraising whether medication is necessary was influenced by the match between what the participant expects to happen when using the medication and what actually does happen. The process of deciding when medication is necessary is influenced by the threshold at which medication is deemed to be necessary and the speed at which symptoms return if medication is stopped.

These findings have implications for the development of interventions to improve adherence to preventer medication for asthma. They suggest that a key component of self-management education is educating patients about the nature of asthma as a chronic condition that is present even in the absence of symptoms. Additionally, they provide evidence that many patients are involved in an active process of appraising the success of their medication. Health professionals should be aware of that this process is likely to be influenced by patients’ expectations of medication, the level of symptoms at which they believe action is required to control asthma and the speed at which symptoms return if medication is discontinued. Future research could take the form of a randomised controlled intervention to assess whether discussion of these factors with patients could improve quality of life for people with asthma.
Acknowledgements

I have been privileged to work with two highly influential academics in the field of Health Psychology, Professors Keith Petrie and John Weinman. Thank you both for helping me with the development of these projects, for everything you have taught me about self-regulation of chronic illness, and for helping me to improve my writing. In particular KP, thanks for your sense of humour and your patience, and John, thanks for being the person you are; a wonderful listener and a fantastic source of support to me and so many others.

I would like to recognise the people and organisations that were instrumental in allowing the first study of this PhD to be completed. First, thanks to the General Practice Research Foundation for recruiting the GP practices that were involved in the first study of this thesis. Big thanks to the wonderful practice research nurses who were involved with accessing information from the practice data-bases and sending out questionnaires. Considerable thanks also go to the NHS R&D for their financial assistance. Most importantly, I would like to acknowledge the close to 2,000 participants in this project for your willingness and your time.

I am grateful to everyone at Guys who helped with the first study included in this thesis, in particular: Kay for her enormous help with data entry and for being a support to me in many ways; Rob Horne for his involvement in the development of the project; and my friends, Florian, Esther, Suzanne, and Carrie, for many great nights talking research over a pint at the Rose.

I would like to acknowledge the statistical support I received in the analysis for the first study of this thesis. Thanks to Matthew Hankins for teaching me to use AMOS and for your ever sound statistical advice. Grateful thanks to John Hattie for your help with the technical aspects of AMOS. Thanks also to Joanna Stewart for your statistical advice.

A number of people helped me with the development, recruitment and analysis for the second study of this PhD. To Linda Cameron, thank you for your advice in the development of this project. I value your ongoing support and encouragement, and am admirable of your willingness to give your time to students. To Jude McCool, a very big thanks for your considerable time and invaluable help as I was trying to get my head around qualitative analysis. Your intelligent approach to research always impresses me. Thanks also to Daniel Devcich for the time you spent helping me to validate the coding for this study. To Tim Kenealy, Lynn and all the staff at Roselands GPs thanks for your friendliness and your valuable help in recruitment. Most significantly, I would like to acknowledge the participants
from Roselands who gave their time to this research. I so enjoyed talking to you, and I have learnt so much from your experiences.

I would especially like to acknowledge the support I received in proof reading this document. Thanks to Dad, Kate and Daniel H for helping me with a task that I diligently avoid. Your willingness to help and your pleasure in detail mean so much to me.

Finally on a more personal note I would like to thank my friends and family that have supported me through this process. To my friends in the department, Trish, Rie, Napaporn, Karolina, Geraldine, Kirsten and Daniel, thanks for your invaluable encouragement and advice. To Nicole and Simon, you have been wonderful sounding boards and kept me sane with your humour. Most of all, as always, thanks to my family, Mum, Dad, Grandma, Tess and Caleb for supporting me in every way. You are my proof that some of us are just born lucky.
# Table of Contents

**ABSTRACT** ........................................................................................................................................................................... II

**ACKNOWLEDGEMENTS** ........................................................................................................................................................ IV

**TABLE OF CONTENTS** ........................................................................................................................................................... VI

**LIST OF TABLES** ................................................................................................................................................................. VIII

**LIST OF FIGURES** ................................................................................................................................................................. IX

**LIST OF ABBREVIATIONS** .................................................................................................................................................. X

**CHAPTER ONE: ASTHMA AND ITS MANAGEMENT** ............................................................................................................. 1

  - Nature and Pathology of Asthma ................................................................................................................................. 1
  - The Impact of Asthma in New Zealand ....................................................................................................................... 5
  - Management of Asthma .................................................................................................................................................. 12

**CHAPTER TWO: THE EXTENT OF NON-ADHERENCE TO PREVENTER MEDICATION FOR ASTHMA** ................................ 21

  - Describing medication-taking behaviour ............................................................................................................. 21
  - Representing use of preventer medication ........................................................................................................... 22
  - Measuring preventer medication use ....................................................................................................................... 23
  - Medication-taking behaviours in asthma and their frequency ............................................................................. 28
  - Medication-taking behaviours and their influence on outcomes ........................................................................ 30

**CHAPTER THREE: FACTORS INFLUENCING USE OF PREVENTER MEDICATION** ................................................................. 33

  - Demographic predictors of adherence .................................................................................................................... 33
  - Non-intentional non-adherence ............................................................................................................................... 35
  - Intentional non-adherence ....................................................................................................................................... 44
  - Limitations of the research into intentional non-adherence to preventer medication for asthma .................. 51

**CHAPTER FOUR: THEORETICAL APPROACHES TO PREDICTING ADHERENCE TO MEDICATION IN ASTHMA** .............. 57

  - The theory of planned behaviour ......................................................................................................................... 58
  - The health belief model .............................................................................................................................................. 59
  - The common-sense model of self-regulation ......................................................................................................... 60
  - Rationale Study One .................................................................................................................................................. 74
  - Aims and hypotheses Study One ............................................................................................................................ 76

**CHAPTER FIVE: METHODS FOR STUDY ONE** ................................................................................................................... 79

  - Participants ............................................................................................................................................................... 79
  - Procedure ................................................................................................................................................................. 80
  - Measures ................................................................................................................................................................. 81
  - Data preparation ...................................................................................................................................................... 85
  - Analysis ................................................................................................................................................................. 86

**CHAPTER SIX: RESULTS FOR STUDY ONE - DESCRIPTIVES** ........................................................................................... 89

  - Identification of patients and response rate .................................................................................................... 89
  - Sample characteristics ........................................................................................................................................ 90
  - Describing medication-taking behaviour ........................................................................................................... 92
  - Comparing measures of medication use for asthma ........................................................................................... 98
  - Describing asthma illness perceptions .............................................................................................................. 99
  - Measuring beliefs about the presence of asthma in the absence of symptoms ........................................... 105
  - Describing beliefs about preventer medication ................................................................................................ 108

**CHAPTER SEVEN: RESULTS FOR STUDY ONE–EXPLAINING NON-ADHERENCE** ............................................................. 113

  - General non-adherence ........................................................................................................................................ 114
  - Symptom-based preventer use ............................................................................................................................ 125
  - Proportion of prescribed medication collected .................................................................................................. 133

**CHAPTER EIGHT: DISCUSSION FOR STUDY ONE** .............................................................................................................. 142

  - Measuring adherence to preventer medication for asthma .................................................................................. 142
  - Adherence rates in this study .................................................................................................................................. 143
List of Tables

TABLE 1 GINA GUIDELINES FOR ASTHMA SEVERITY CLASSIFICATION ........................................................................................................3
TABLE 2: DEMOGRAPHIC CHARACTERISTICS OF THE SAMPLE ..................................................................................................................90
TABLE 3: ASTHMA AND CLINICAL CHARACTERISTICS OF THE SAMPLE ..............................................................................................91
TABLE 4: THE FACTOR STRUCTURE OF ITEMS MEASURING WAYS OF USING MEDICATION .................................................................94
TABLE 5: THE FACTOR STRUCTURE OF ITEMS MEASURING WAYS OF USING MEDICATION WITHOUT ALTERING DOSE ................95
TABLE 6: INFORMATION ON MEDICATION COLLECTED TAKEN FROM MEDICAL RECORDS .............................................................97
TABLE 7: THE SPEARMAN’S RHO CORRELATION COEFFICIENT SHOWING THE RELATIONSHIP BETWEEN THE ITEMS ON THE WAYS OF USING MEDICATION QUESTIONNAIRE AND PROPORTION OF PRESCRIBED MEDICATION COLLECTED ..........99
TABLE 8: FREQUENCY TABLE SHOWING THE MOST LIKELY CAUSE OF ASTHMA REPORTED BY PARTICIPANTS .........................102
TABLE 9: FREQUENCY TABLE SHOWING THE TRIGGER REPORTED AS BEING THE MOST COMMON BY PARTICIPANTS .................102
TABLE 10: PERCENTAGE OF PARTICIPANTS ENDORSING EACH SYMPTOM FOR ASTHMA ...........................................................................103
TABLE 11: INTERNAL CONSISTENCY FIGURES OF ITEMS MEASURING NO ASTHMA WHEN ASYMPTOMATIC .........................................105
TABLE 12: PEARSON’S CORRELATION COEFFICIENTS REPRESENTING THE RELATIONSHIP BETWEEN NO ASTHMA WHEN ASYMPTOMATIC AND ILLNESS REPRESENTATIONS ..............................................................................106
TABLE 13: PERCENT OF SAMPLE AGREEING WITH BMQ-COncERNS ITEMS ........................................................................................108
TABLE 14: RELIABILITY STATISTICS FOR ITEMS ON THE BMQ-COncERNS SCALE ................................................................................109
TABLE 15: PERCENT OF THE SAMPLE AGREEING WITH BMQ-NECESSITY ITEMS .................................................................................110
TABLE 16: INTERNAL CONSISTENCY OF ITEMS MEASURING BELIEFS ABOUT NECESSITY IN THE ABSENCE OF SYMPTOMS .........111
TABLE 17: INTER-ITEM CORRELATIONS BETWEEN ITEMS MEASURING NECESSITY AND ITEMS MEASURING BELIEFS ABOUT NECESSITY IN THE ABSENCE OF SYMPTOMS ......................................................................................111
TABLE 18: RELATIONSHIPS BETWEEN ADHERENCE MEASURES, DEMOGRAPHIC AND ILLNESS VARIABLES ........................................115
TABLE 19: RELATIONSHIPS BETWEEN ADHERENCE MEASURES, ILLNESS REPRESENTATIONS AND TREATMENT BELIEFS ........118
TABLE 20: DEMOGRAPHIC CHARACTERISTICS OF THE SAMPLE ......................................................................................................178
TABLE 21: ASTHMA SEVERITY AND RELIEVER USE OF THE SAMPLE .............................................................................................179
TABLE 22: ILLNESS AND TREATMENT BELIEFS ASSOCIATED WITH EXPERIMENTING WITH MEDICATION .................................182
TABLE 23: WAYS OF USING MEDICATION ..............................................................................................................................................185
List of Figures

FIGURE 1: WAYS OF USING PREVENTER MEDICATION ............................................................................................................... 93
FIGURE 2: HISTOGRAM SHOWING THE DISTRIBUTION OF SCORES ON THE GENERAL NON-ADHERENCE SCALE .................... 95
FIGURE 3: HISTOGRAM SHOWING THE DISTRIBUTION OF SCORES ON THE SYMPTOM-BASED PREVENTER USE SCALE ........ 96
FIGURE 4: FREQUENCY DISTRIBUTION OF MEDICATION COLLECTED AS A PERCENTAGE OF MEDICATION PRESCRIBED ........... 97
FIGURE 5: FREQUENCY DISTRIBUTION OF PERCENTAGE OF PRESCRIBED MEDICATION COLLECTED TRUNCATED .................... 98
FIGURE 6: THE DISTRIBUTION OF RESPONSES TO CHRONIC AND CYCLICAL TIMELINE SUBSCALES ........................................... 100
FIGURE 7: THE DISTRIBUTION OF RESPONSES ON THE SCALE COHERENCE................................................................................ 100
FIGURE 8: THE DISTRIBUTION OF RESPONSES ON THE SCALE CONSEQUENCES........................................................................ 101
FIGURE 9: THE DISTRIBUTION OF RESPONSES ON THE SCALES PERSONAL CONTROL AND TREATMENT CONTROL ......... 101
FIGURE 10: THE DISTRIBUTION OF RESPONSES ON THE SCALE EMOTIONAL REPRESENTATIONS ..................................................... 104
FIGURE 11: THE DISTRIBUTION OF SCORES ON THE NO ASTHMA WHEN ASYMPTOMATIC SCALE ........................................... 106
FIGURE 12: THE DISTRIBUTION OF SCORES ON THE NECESSITY WHEN ASYMPTOMATIC SCALE .................................................. 112
FIGURE 13: THE INDICATORS OF THE LATENT VARIABLE ADHERENCE .......................................................................................... 114
FIGURE 14: DEMOGRAPHIC VARIABLES PREDICTING GENERAL NON-ADHERENCE ............................................................... 117
FIGURE 15: ILLNESS REPRESENTATIONS PREDICTING GENERAL NON-ADHERENCE ............................................................... 120
FIGURE 16: ILLNESS REPRESENTATIONS AND TREATMENT BELIEFS PREDICTING GENERAL NON-ADHERENCE ..................... 123
FIGURE 17: ILLNESS REPRESENTATIONS, TREATMENT BELIEFS AND NECESSITY IN THE ABSENCE OF SYMPTOMS PREDICTING ADHERENCE ........................................................... 124
FIGURE 18: DEMOGRAPHIC VARIABLES AND ONLY SYMPTOMATIC USE .................................................................................. 126
FIGURE 19: ILLNESS REPRESENTATIONS AND SYMPTOM-BASED PREVENTER USE ................................................................. 128
FIGURE 20: ILLNESS REPRESENTATIONS, TREATMENT BELIEFS AND SYMPTOM-BASED PREVENTER USE .............................. 131
FIGURE 21: ILLNESS REPRESENTATIONS, TREATMENT BELIEFS, NECESSITY IN THE ABSENCE OF SYMPTOMS AND SYMPTOM-BASED PREVENTER USE .............................................................. 132
FIGURE 22: DEMOGRAPHIC VARIABLES PREDICTING PROPORTION OF PRESCRIBED MEDICATION COLLECTED .................... 134
FIGURE 23: ILLNESS REPRESENTATIONS PREDICTING PROPORTION OF PRESCRIBED MEDICATION COLLECTED ..................... 136
FIGURE 24: ILLNESS REPRESENTATIONS AND TREATMENT BELIEFS PREDICTING PROPORTION OF PRESCRIBED MEDICATION COLLECTED .................................................................................. 139
FIGURE 25: ILLNESS REPRESENTATIONS, TREATMENT BELIEFS AND NECESSITY IN THE ABSENCE OF SYMPTOMS PREDICTING PROPORTION OF PRESCRIBED MEDICATION COLLECTED ............. 140
FIGURE 26: FREQUENCY OF SCORES ON AVOIDANCE OF ASTHMA THOUGHT .............................................................................. 183
FIGURE 27: DECIDING IF MEDICATION WORKS .......................................................................................................................... 201
FIGURE 28: WHEN IS MEDICATION NECESSARY? ....................................................................................................................... 205
# List of Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AIRE</td>
<td>Asthma Insights and Reality in Europe</td>
</tr>
<tr>
<td>BMQ</td>
<td>Beliefs about Medication Questionnaire</td>
</tr>
<tr>
<td>CFI</td>
<td>Comparative Fit Index</td>
</tr>
<tr>
<td>CI</td>
<td>Confidence Interval</td>
</tr>
<tr>
<td>COPD</td>
<td>Chronic Obstructive Pulmonary Disease</td>
</tr>
<tr>
<td>CSM</td>
<td>Common-Sense Model of Self-Regulation</td>
</tr>
<tr>
<td>FP</td>
<td>Fluticasone Propionate</td>
</tr>
<tr>
<td>GINA</td>
<td>Global Initiative for Asthma</td>
</tr>
<tr>
<td>GP</td>
<td>General Practitioner</td>
</tr>
<tr>
<td>HADS</td>
<td>Hospital Anxiety and Depression Scale</td>
</tr>
<tr>
<td>HBM</td>
<td>Health Belief Model</td>
</tr>
<tr>
<td>ICS</td>
<td>Inhaled Corticosteroids</td>
</tr>
<tr>
<td>IPQ</td>
<td>Illness Perceptions Questionnaire</td>
</tr>
<tr>
<td>IPQ-R</td>
<td>Revised Illness Perceptions Questionnaire</td>
</tr>
<tr>
<td>LABA</td>
<td>Long-acting beta agonist</td>
</tr>
<tr>
<td>MARS</td>
<td>Medication Adherence Report Scale</td>
</tr>
<tr>
<td>MPR</td>
<td>Medication Possession Ratio</td>
</tr>
<tr>
<td>NAWA</td>
<td>No Asthma when Asymptomatic</td>
</tr>
<tr>
<td>PANAS</td>
<td>Positive and Negative Affect Scale</td>
</tr>
<tr>
<td>RMSEA</td>
<td>Root Mean Square Error of Approximation</td>
</tr>
<tr>
<td>SEM</td>
<td>Structural Equation Modelling</td>
</tr>
<tr>
<td>SES</td>
<td>Socio-Economic Status</td>
</tr>
<tr>
<td>SF-12</td>
<td>Short Form 12</td>
</tr>
<tr>
<td>TPB</td>
<td>Theory of Planned Behaviour</td>
</tr>
<tr>
<td>TRA</td>
<td>Theory of Reasoned Action</td>
</tr>
<tr>
<td>UK</td>
<td>United Kingdom</td>
</tr>
</tbody>
</table>