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MASTERCLASS 2

Behavioral frameworks for understanding patient adherence

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Behavioral frameworks for understanding patient adherence

Overview

01

Background – Adherence is a behavior

02

Going beyond knowledge & forgetting: the importance of beliefs

03

Current state. of knowledge re. determinants

04

Implications for changing adherence behavior

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Adherence is a behavior

Adherence = The extent to which patients follow medical treatment and advice

(i) Uptake[1]

(ii) Implementation[1]

(iii) Discontinuation[1]

1. Bernard Vrijens , Sabina De Geest, Dyfrig A. Hughes, Kardas Przemyslaw, Jenny Demonceau, Todd Ruppar, Fabienne Dobbels, Emily Fargher, Valerie Morrison, Pawel Lewek, Michal Matyjaszczyk, Comfort Mshelia, Wendy Clyne, Jeffrey K. Aronson and J. Urquhart: A new taxonomy for describing and defining adherence to medications. British Journal of Clinical Pharmacology, 73, 691–705, May 2012, DOI: 10.1111/j.1365-2125.2012.04167.x [Accessed 26 June 2020], https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3403197/

Adherence is a behavior

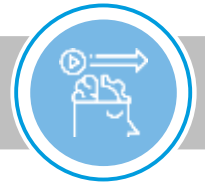
Early explanations

Early explanations of non-adherence – (A) lack of knowledge or understanding[2] ; (B) forgetting.[2]

Early explanations – based on the idea that non-adherence = unintentional but many studies have shown that it is often intentional (i.e. motivated and based on people's beliefs etc.)

Early interventions – mainly based on information provision and/or reminders.

(e.g. Ley showed that simplifying and organizing key medicines information could make it more memorable and reduce forgetting[2]).



BUT - information provision per se doesn't change behavior.

We all know lots of important health information, but it doesn't automatically change our behavior.

2. Philip Ley: Understanding, memory, satisfaction and compliance, Br. J. Clin. Psychol : 21 , 241–254, Nov 1982, DOI: 10.1111/j.2044-8260.1982.tb00562.x [Accessed 26 June 2020], https://onlinelibrary.wiley.com/doi/abs/10.1111/j.2044-8260.1982.tb00562.x?sid=nlm%3Apubmed

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Adherence is a behavior

Forgetting

Many patients state **forgetting** as their main reason for non-adherence (roughly 25% of patients[3])

Is it just forgetting?

Many apps and other digital approaches tend to focus on providing prompts and cues

BUT - providing reminders only helpful if people are motivated to adhere. Large recent studies have shown that reminders don't work for people who are non-adherent[4]

3. Muhammad Umair Khan, Shahjahan Shah and Tahir Hameed, Barriers to and determinants of medication adherence among hypertensive patients attended National Health Service Hospital, Sunderland, 10.4103/0975-7406.129175, Apr – Jun, 201, [Accessed 10 July 2020] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3983739/

4. Niteesh K. Choudhry, Alexis A. Krumme, Patrick M. Ercole, Chairman Girdish, Angela Y. Tong, Nazleen F. Khan, Troyen A. Brennan, Olga S. Matlin, William H. Shrank and Jessica M. Franklin: The effect of reminder devices on medication adherence : the REMIND randomised clinical trial, JAMA Intern. Med, May 2017, DOI: 10.1001/jamainternmed.2016.9627 [Accessed 26 June 2020], https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5470369/

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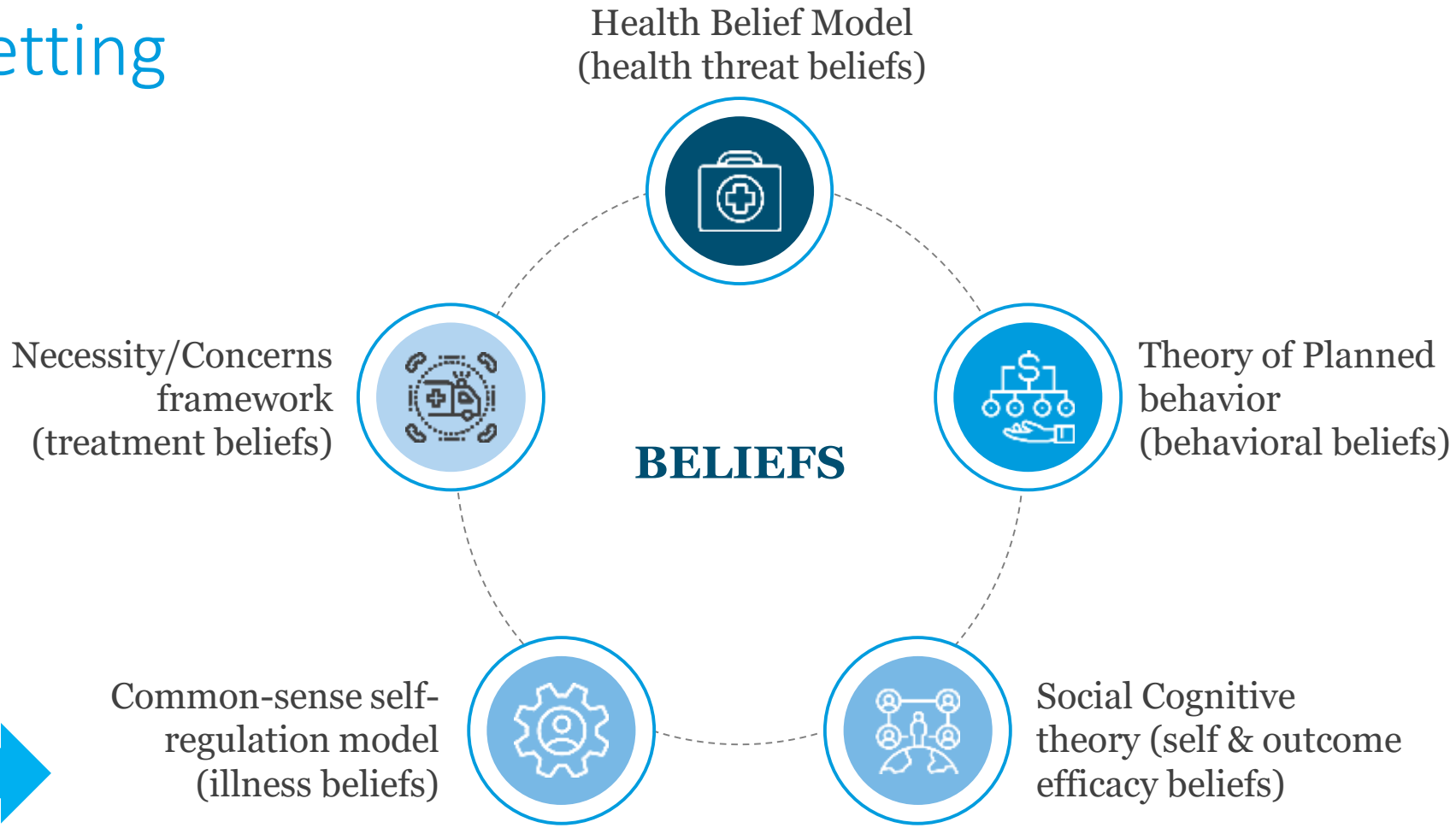
Going beyond knowledge & forgetting

The importance of beliefs

When it was realized that information provision did not change health related behavior, other **explanations, based on people's beliefs, were developed.**

THESE INCLUDED



Going beyond knowledge & forgetting

The importance of beliefs

The Health Belief Model

Health behavior (including adherence) – based on two factors

- **Threat perceptions** (severity x susceptibility of the health problem)[5]
- Evaluation of the **behavior needed to deal with the threat** (benefits v. barriers re doing the behavior - eg adherence to medicine) [5]

A general model which has been applied to many health behaviors, particularly preventive behaviors but has been applied to adherence

5. Nancy Janz and Marshall H. Becker: The Health Belief Model: a decade later, Health Education Quarterly, 11, 1, 1-47, Jan 1984 [Accessed 26 June 2020], https://deepblue.lib.umich.edu/bitstream/handle/2027.42/66877/10.1177_109019818401100101.pdf;jsessionid=0A672799D25A5480E76B16A9C6764C68?sequence=2

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Going beyond knowledge & forgetting

The importance of beliefs

Theory of planned behavior

A general theory aimed at explaining **how beliefs /attitudes influence a person' decision to engage in a behavior**[6]**.**

Proposes that the key determinants of a behavior (eg adherence) are:

- **Intentions**
- **Perceived behavioral control** over the behavior

INTENTION assumed to be determined by 3 factors:

- **Attitudes to the behavior** (based on outcome expectancies + value of outcome)
- **Subjective norms** (beliefs about what sig others view of the behavior x motivation to comply with this)
- **Perceived behavioral control**

6. G. Godin and G. Kok: The Theory of Planned Behaviour: a review of its application to health-related behaviors, Am. J. Health Promot, 11, 2, 87-98, Dec 1996, DOI: 10.4278/0890-1171-11.2.87 [Accessed 26 June 2020], https://pubmed.ncbi.nlm.nih.gov/10163601/

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Going beyond knowledge & forgetting: importance of beliefs

Social Cognitive theory[7]

Proposes that behavior (including adherence) is determined by 3 main factors

Goals – plans to act
(similar to intentions)

Outcome expectancies –
beliefs about the likely outcome
of the behavior

Self-efficacy – beliefs about how much the behavior is under one's own control (level of confidence in being to perform the behavior in the face of different barriers)

A general theory – which has been applied to health behaviors, including adherence

7. Albert Bandura: Self-efficacy in human agency, American Psychologist, 37, 122-147, 1982 [Accessed 26 June 2020], https://pdfs.semanticscholar.org/8bee/c556fe7a650120544a99e9e063eb8fcd987b.pdf

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Going beyond knowledge & forgetting

The importance of beliefs

Illness beliefs (Leventhal's Common-Sense Model of self-regulation[8])

Patients **develop their own beliefs** about the nature of their illness, symptom or health threat.

Patients' **illness beliefs directly influence their coping, including adherence.**

8. Howard Leventhal, L. Alison Philips and Edith Burns: The common-sense model of self-regulation (CSM): a dynamic framework for understanding illness self-management. Journal of Behavioral Medicine, 39(6), 935-946, Dec 2016, DOI: 10.1007/s10865-016-9782-2 [Accessed 26 June 2020], https://link.springer.com/article/10.1007/s10865-016-9782-2

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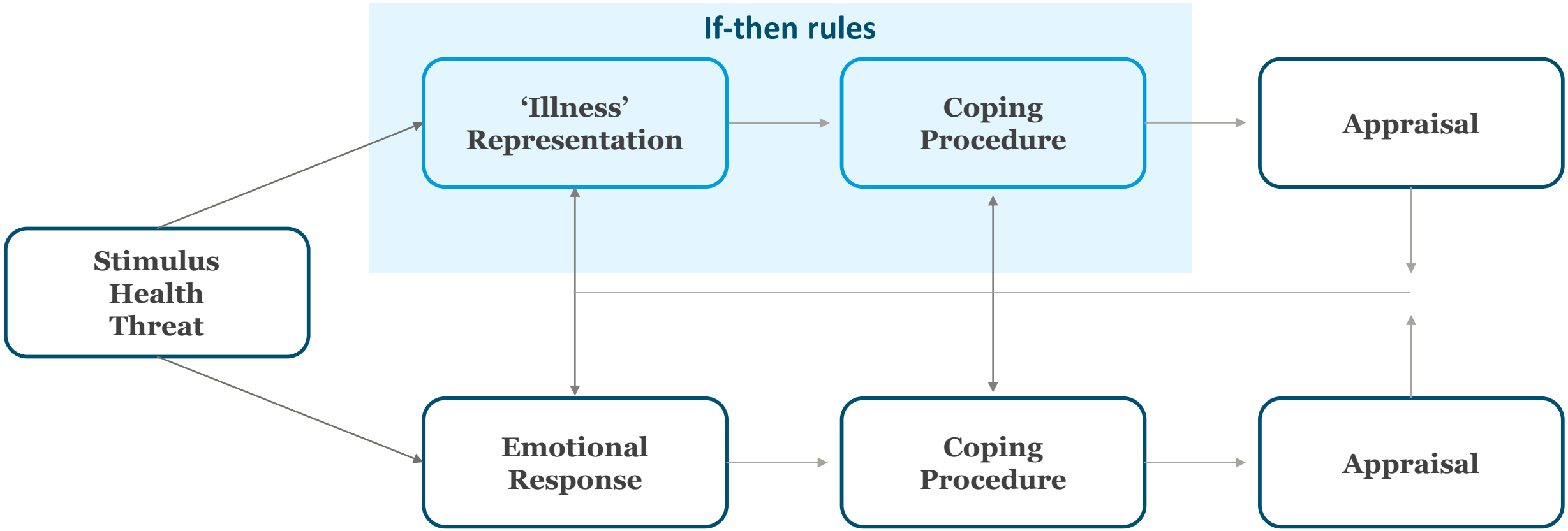
Leventhal's self-regulation model[9]



9. Self-Regulation, Health Psychology, [Accessed 26 June 2020], http://psychology.iresearchnet.com/health-psychology-research/self-regulation/

Core beliefs about illness (Leventhal SRM[9])

Belief Category	Description
Identity	Abstract label e.g., hypertension; asthma; arthritis Concrete symptoms that a person associates with the condition
Causal Beliefs	Stress, environment, genetics, own behavior, ageing, etc.
Timeline	Perceived duration and profile, e.g. chronic, acute, cyclical
Consequences	Personal, economic and social
Cure/control	Beliefs about the amenability to control or cure

9. Self-Regulation, Health Psychology, [Accessed 26 June 2020], http://psychology.iresearchnet.com/health-psychology-research/self-regulation/

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Illness perception & treatment adherence

Some illness perceptions are associated with treatment adherence in some conditions, E.G.

Causal beliefs predict adherence behavior in post- MI[10]

Timeline beliefs predict preventer medication adherence in asthma etc.[11]

Causal, timeline & control beliefs predict adherence to CBT for Psychosis[12]

But – illness beliefs per se are not strong predictors of treatment adherence

Need to consider more proximal predictors (i.e. patients' beliefs re. treatment)

10. David French, Delyth Higman James, Rob Horne and John Weinman: Causal beliefs and behaviour change post-myocardial infarction: How are they related? British Journal of Health Psychology, 10(2), pp.167-182, June 2005, DOI: 10.1348/135910705X26722 [Accessed 26 June 2020], https://www.researchgate.net/publication/7773256_Causal_beliefs_and_behaviour_change_post-myocardial_infarction_How_are_they_related;
11. Robert Horne and John Weinman: Self-regulation and self-management in asthma: exploring the role of illness perceptions and treatment beliefs in explaining non-adherence to preventer medication, Psychology & health, 17(1), 17 – 32, Oct 2010, DOI:10.1080/08870440290001502 [Accessed 26 June 2020], https://www.tandfonline.com/doi/abs/10.1080/08870440290001502;
12. D. Freeman, G. Duun, P. Garety, J. Weinman, E. Kuipers, D. Fowler, S. Jolley and P. Bebbington: Patients' beliefs about the causes, persistence and control of psychotic experiences predict take-up of effective cognitive behaviour therapy for psychosis, Psychological Medicine, 43(2), 269-277, Jul 2010, DOI: 10.1017/S0033291712001225 [Accessed 26 June 2020], https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3544544/

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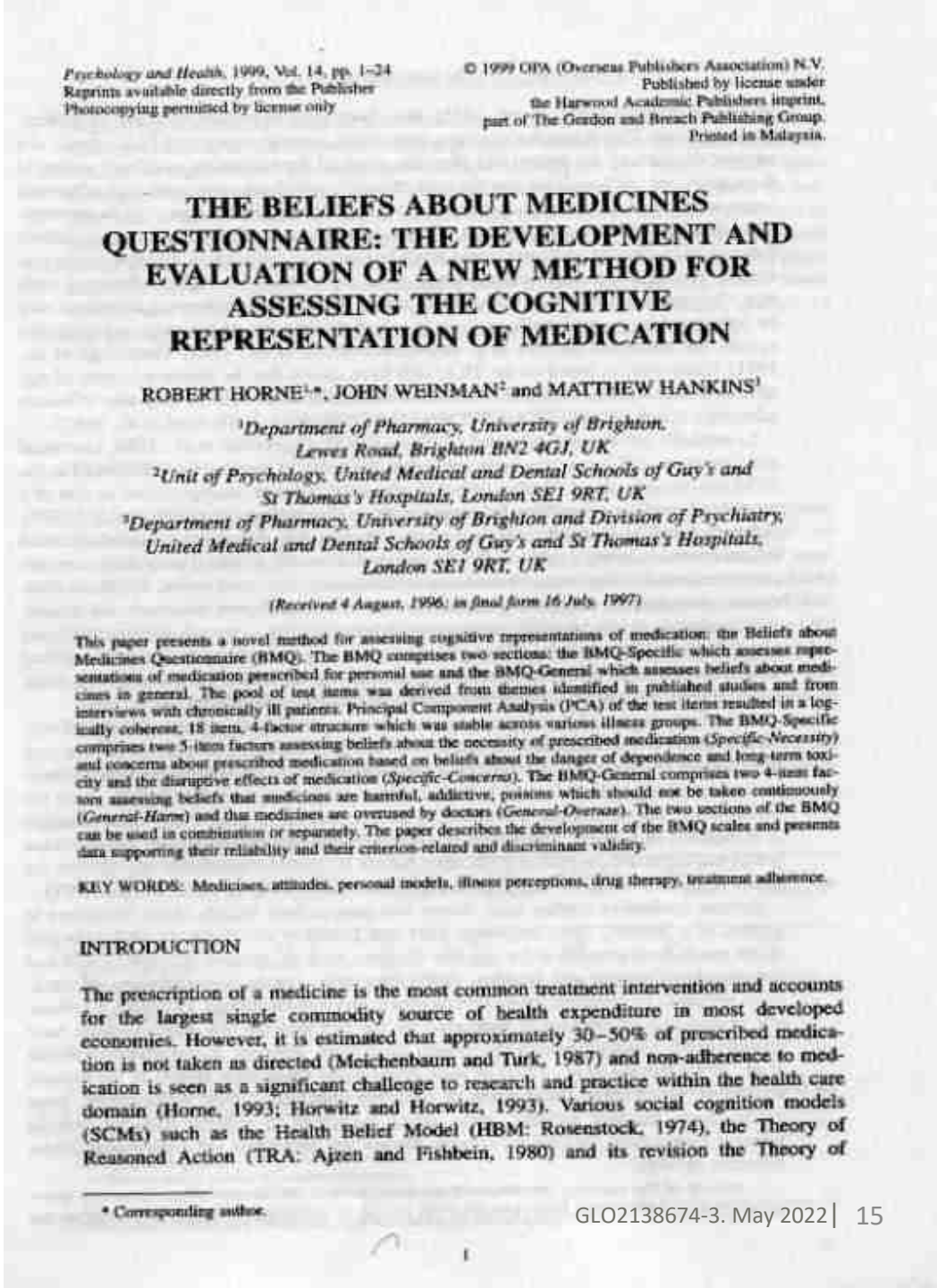
Beliefs about medicines questionnaire[13]

Specific Beliefs about medicines prescribed for a particular illness

General Beliefs about medicines as a whole



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THE BELIEFS ABOUT MEDICINES QUESTIONNAIRE: THE DEVELOPMENT AND EVALUATION OF A NEW METHOD FOR ASSESSING THE COGNITIVE REPRESENTATION OF MEDICATION

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This paper presents a novel method for assessing cognitive representations of medication: the Beliefs about Medicines Questionnaire (BMQ). The BMQ comprises two sections: the BMQ-Specific which assesses representations of medication prescribed for personal use and the BMQ-General which assesses beliefs about medicines in general. The pool of test items was derived from themes identified in published studies and from interviews with chronically ill patients. Principal Component Analysis (PCA) of the test items resulted in a logically coherent, 18 item, 4-factor structure which was stable across various illness groups. The BMQ-Specific comprises two 5-item factors assessing beliefs about the necessity of prescribed medication (*Specific-Necessity*) and concerns about prescribed medication based on beliefs about the danger of dependence and long-term toxicity and the disruptive effects of medication (*Specific-Concerns*). The BMQ-General comprises two 4-item factors assessing beliefs that medicines are harmful, addictive, poisons which should not be taken continuously (*General-Harm*) and that medicines are overused by doctors (*General-Overuse*). The two sections of the BMQ can be used in combination or separately. The paper describes the development of the BMQ scales and presents data supporting their reliability and their criterion-related and discriminant validity.

KEY WORDS: Medicines, attitudes, personal models, illness perceptions, drug therapy, treatment adherence.

INTRODUCTION

The prescription of a medicine is the most common treatment intervention and accounts for the largest single commodity source of health expenditure in most developed economies. However, it is estimated that approximately 30–50% of prescribed medication is not taken as directed (Meichenbaum and Turk, 1987) and non-adherence to medication is seen as a significant challenge to research and practice within the health care domain (Horne, 1993; Horwitz and Horwitz, 1993). Various social cognition models (SCMs) such as the Health Belief Model (HBM: Rosenstock, 1974), the Theory of Reasoned Action (TRA: Ajzen and Fishbein, 1980) and its revision the Theory of

* Corresponding author.

13. Robert Horne, John Weinman and Maittew Hankins: The beliefs about medicines questionnaire: The development and evaluation of a new method for assessing the cognitive representation of medication, Psychology & Health, 14(1), 1-24, 1999, DOI: 10.1016/j.jphys.2017.04.006 [Accessed 26 June 2020], https://www.tandfonline.com/doi/abs/10.1080/08870449908407311

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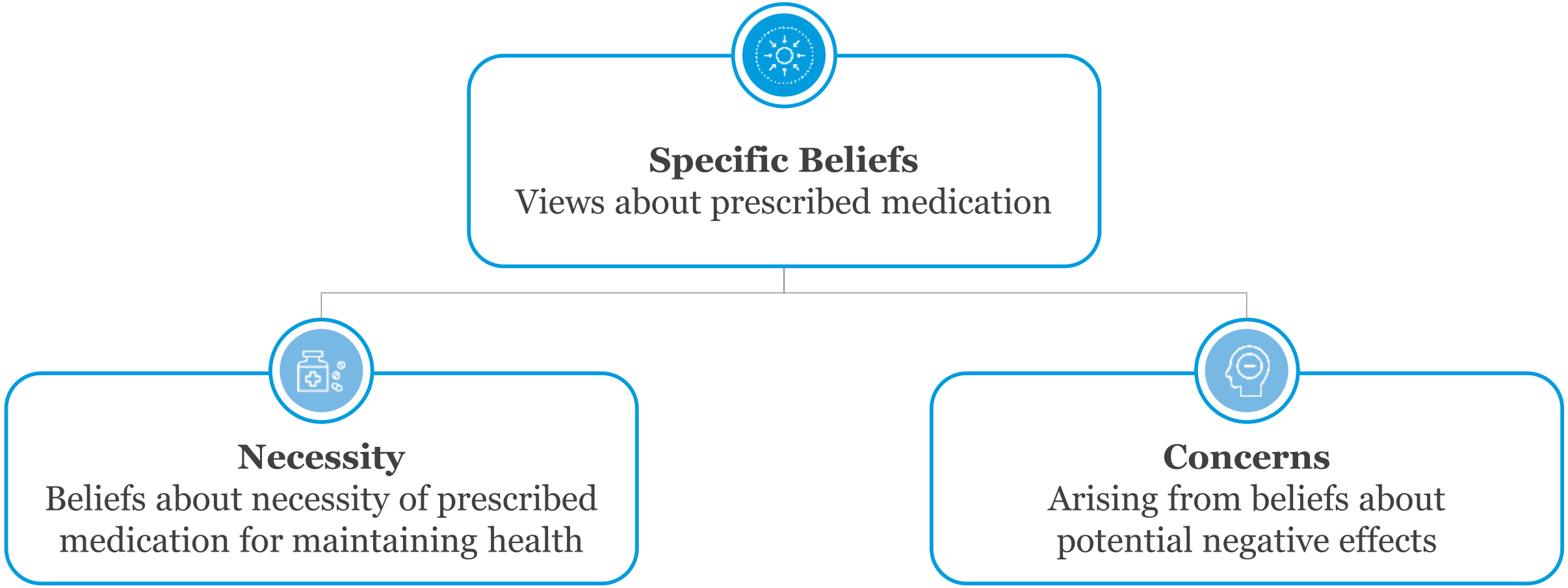
Beliefs about medicines questionnaire[14]



14. Robert Horne, John Weinman and Maittew Hankins: The beliefs about medicines questionnaire: The development and evaluation of a new method for assessing the cognitive representation of medication, Psychology & Health, 14(1), 1-24, 1999, **DOI: 10.1016/j.jphys.2017.04.006** [Accessed 26 June 2020], https://www.tandfonline.com/doi/abs/10.1080/08870449908407311

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Studies in asthma, CHD, cancer, renal dialysis, HIV/AIDS, hypertension, diabetes[15]

Doubts about **Necessity**

Concerns about potential adverse effects

Low adherence

15. Robert Horne, Sarah C E Chapman, Rhian Parham, Nick Freemantle, Alastair Forbes and Vanessa Cooper: Understanding Patients' Adherence-Related Beliefs about Medicines Prescribed for Long-Term Conditions: A Meta-Analytic Review of the Necessity-Concerns Framework, PLoS ONE 8(12), Dec 2013, DOI: 10.1371/journal.pone.0080633 [Accessed 26 June 2020], https://pubmed.ncbi.nlm.nih.gov/24312488/

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Current state of knowledge re. determinants

Which are the most important for adherence?

Systematic reviews – reveal **very large number of possible causal factors of non-adherence**[16]

Modifiable (e.g. knowledge, motivation, support) & **non-modifiable** factors (e.g. age, gender, SES)

16. Przemyslaw Kardas, Pawel Lewek and Michal Matyjaszczyk: Determinants of patient adherence : a review of systematic reviews, July 2013, **DOI: 10.3389/fphar.2013.00091** [Accessed 26 June 2020], https://www.frontiersin.org/articles/10.3389/fphar.2013.00091/full

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Predictors of non-adherence: overview of evidence[17]

Weak Evidence
- Gender
- Income
- Age
- Race
- Income, personality

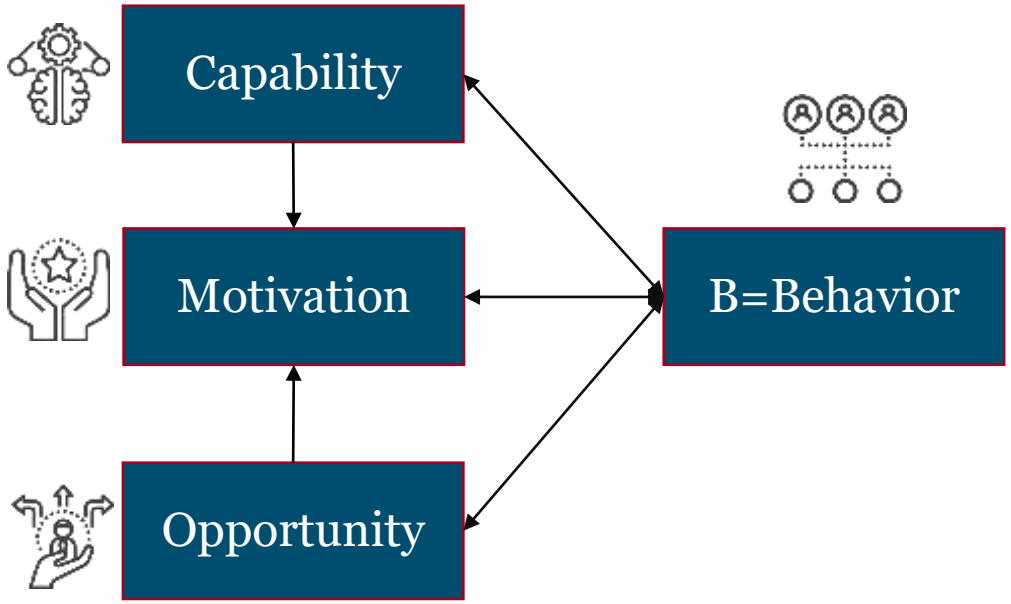
Moderate Evidence
- Cognitive ability, depression, social support, coping skills
- Number of medicines, disease seriousness beliefs
- Health literacy, locus of control
- Self efficacy, trust in HCP, HCP-patient concordance
- Symptom experience

Strong Evidence
- Concerns about treatment (fear of side effects, etc.)
- Beliefs about illness (cause, timeline)
- Cost of therapy
- Necessity (perceived need) for treatment
- Perceived drug efficacy

17. Colleen A. McHorney and Charles V. Spain: Frequency of and reasons for medication non-fulfillment and non-persistence among American adults with chronic disease in 2008, Health Expectations Volume 14, Issue 3, pages 307–320, Sept 2011, DOI: 10.1111/j.1369-7625.2010.00619.x [Accessed 26 June 2020], https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5060587/

Current state of knowledge re. determinants

- How to classify the modifiable factors : the COM-B framework [18]
- **Incorporates all the factors which have been found to influence health-related behaviors**, and puts then into 3 broad groups
  - **Capability**
  - **Opportunity**
  - **Motivation**
  - **(B= Behavior)**
- A general framework which has now been applied to adherence



18. Susan Michie, Maartje M. van Stralen and Robert West: The behaviour change wheel: A new method for characterising and designing behaviour change interventions. Implementation Science 6, 42, Apr 2011, DOI: 10.1186/1748-5908-6-42 [Accessed 26 June 2020], https://pubmed.ncbi.nlm.nih.gov/21513547/

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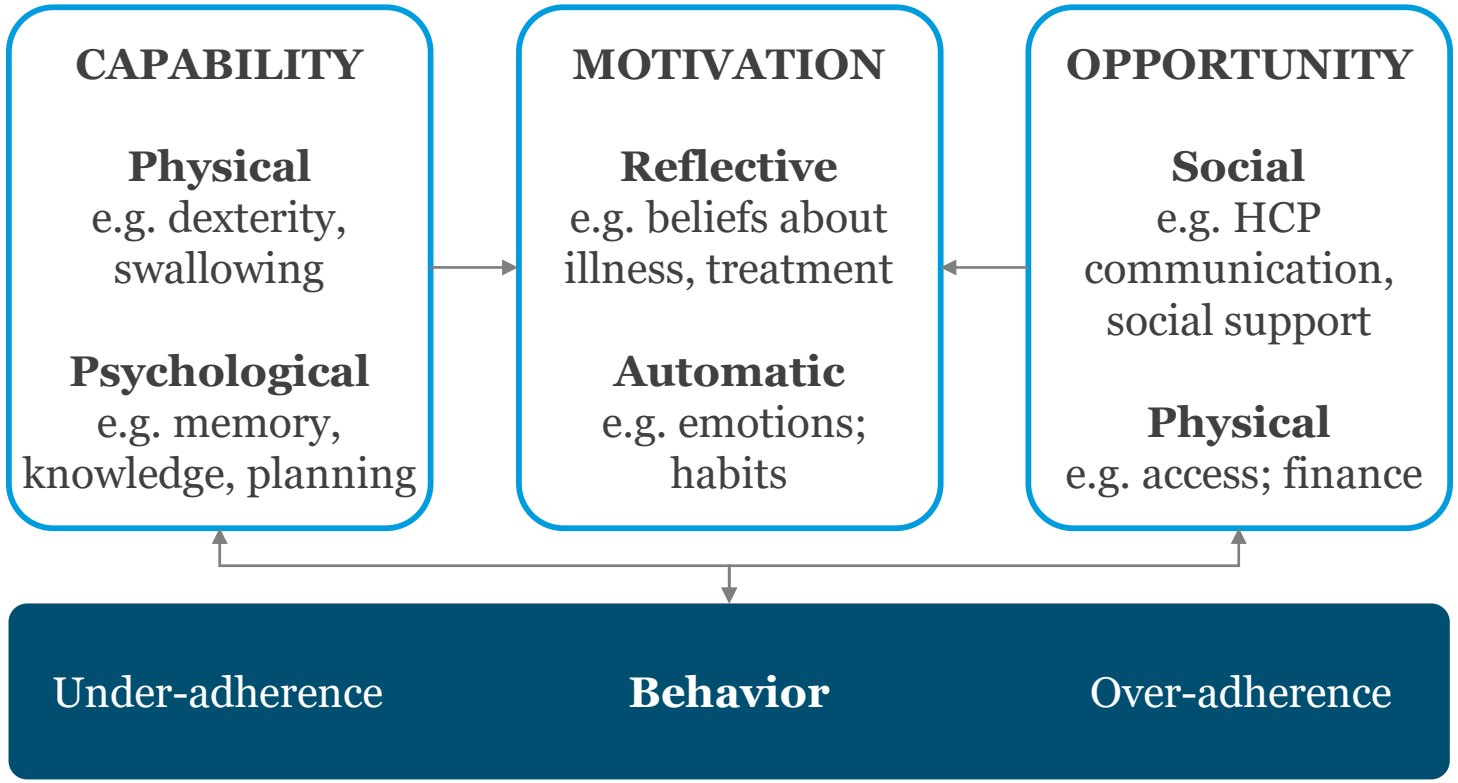
A new approach to classifying causes of non-adherence: COM-B[19]



19. Christina Jackson, Lina Eliasson, Nick Barber and John Weinman: Applying COM-B to medication adherence: a suggested framework for research and interventions, The European Health Psychologist, Jan 2014 [Accessed 26 June 2020], https://pdfs.semanticscholar.org/bfdb/62f5430b90243959e8a989abf5ddb12ee32b.pdf

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original article

Applying COM-B to medication adherence

A suggested framework for research and interventions

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On average only fifty percent of people with long term conditions are adherent to their treatment across diverse disease and patient groups (Holloway & van Dijk, 2011; Sabaté, 2003). Medication non-adherence leads to reduced clinical benefit, avoidable morbidity and mortality and medication wastage (DiMatteo, Giordani, Lepper, & Croghan, 2002). With increases in life expectancies as well as the number of patients managing chronic illnesses, this problem may well become worse in the next few years. Consequently, policy makers have called for successful interventions to address the causes of non-adherence and improve the population's use of medicines (Holloway & van Dijk, 2011; Horne, Weinman, Barber, Elliott, & Morgan, 2006; Nunes et al., 2009; Sabaté, 2003). Indeed, it has been estimated that $269 billion worldwide could be saved by improving patient medication adherence (IMS Institute for Healthcare Informatics, 2012).

Unfortunately, many adherence interventions to date have not been effective (Haynes, Ackloo, Sahota, McDonald, & Yao, 2008). Medical Research Council guidelines recommend that appropriate theory and evidence should be identified to inform the development of an intervention (Craig et al., 2008). However, most adherence interventions are developed without a sound theoretical base, which may be one of the reasons they have not been effective (Horne et al., 2006). Successful interventions have often involved a level of complexity that would be too difficult and expensive to implement in practice (Haynes et al., 2008).

Explanations and models of medication adherence/non-adherence have changed over the years. Early work tended to focus on the role of doctor-patient communication and its effects on patient satisfaction, understanding and forgetting as key determinants of subsequent treatment adherence (Ley, 1988). However, health behaviour research has consistently demonstrated that the provision of information alone is not an effective way to change behaviour, and so research has now moved onto approaches and models which focus on patients' beliefs, motivation and planning abilities as the core explanatory variables. Many of these are social cognition or self-regulatory models which emphasize the importance of the beliefs which individuals have about their illness and treatment as well as their own ability to follow the treatment and advice which they are given (see Conner & Norman, 2005). Existing models and frameworks are not comprehensive since they neglect automatic processes such as habit (for example, Ajzen, 1985; Bandura, 1977, 1986; Horne, 1997, 2003; Leventhal, Nerenz, & Steele, 1984; Pound et al., 2005; Rosenstock, 1974), do not describe dynamic behaviours whereby the experience of adherence/non-adherence can alter predisposing factors such as beliefs about medication (for example, Ajzen, 1985; Bandura, 1977, 1986; Horne, 2003; Pound et al., 2005; Rosenstock, 1974) and neglect factors at a systems level (for example, Horne, 2000, 2003; Leventhal et al., 1984; Pound et al., 2005; Rosenstock, 1974). In addition, the often used

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Applying com-b framework to medication adherence in hypertension

Capability
- Poor knowledge of hypertension
- Poor understanding of risk Problems in planning /memory

Motivation
- Beliefs about hypertension
- Low beliefs in need for treatment (asymptomatic)
- Concerns about side-effects
- Low self-efficacy beliefs
- Mood disorders - partic anxiety & depression.
- Low habit strength

Opportunity
- Complexity of regimen in patients with comorbid conditions
- Beliefs/support of partners & caregivers
- Lack of perceived support from HCP
- HCP reluctance to move to other treatments

Under-adherence | **Adherence to daily anti-hypertensive medication** | Over-adherence

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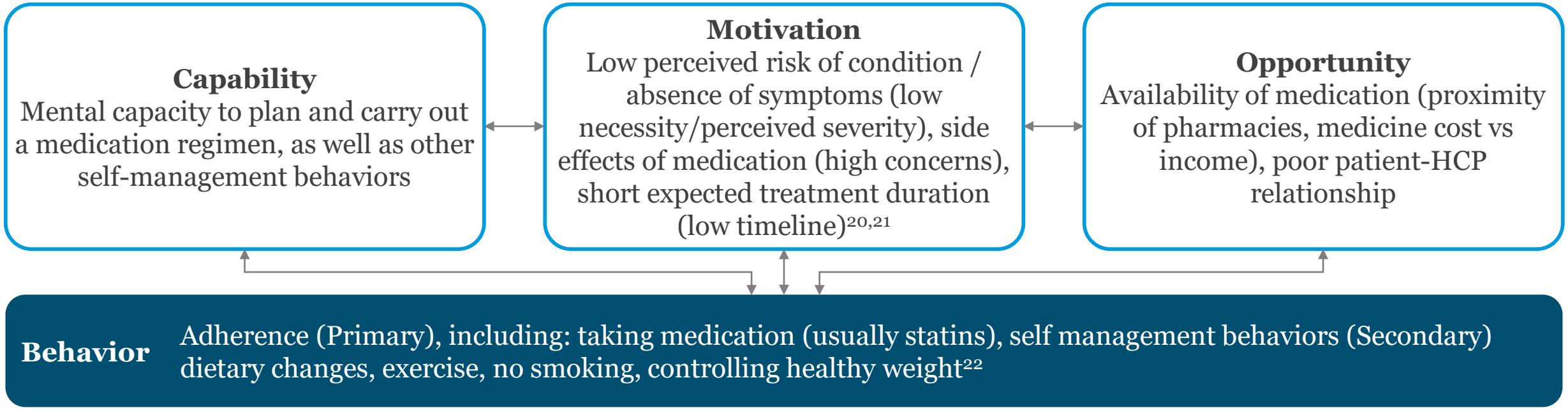
Factors impacting capability, opportunity and motivation of dyslipidemia patients to adhere and self-manage

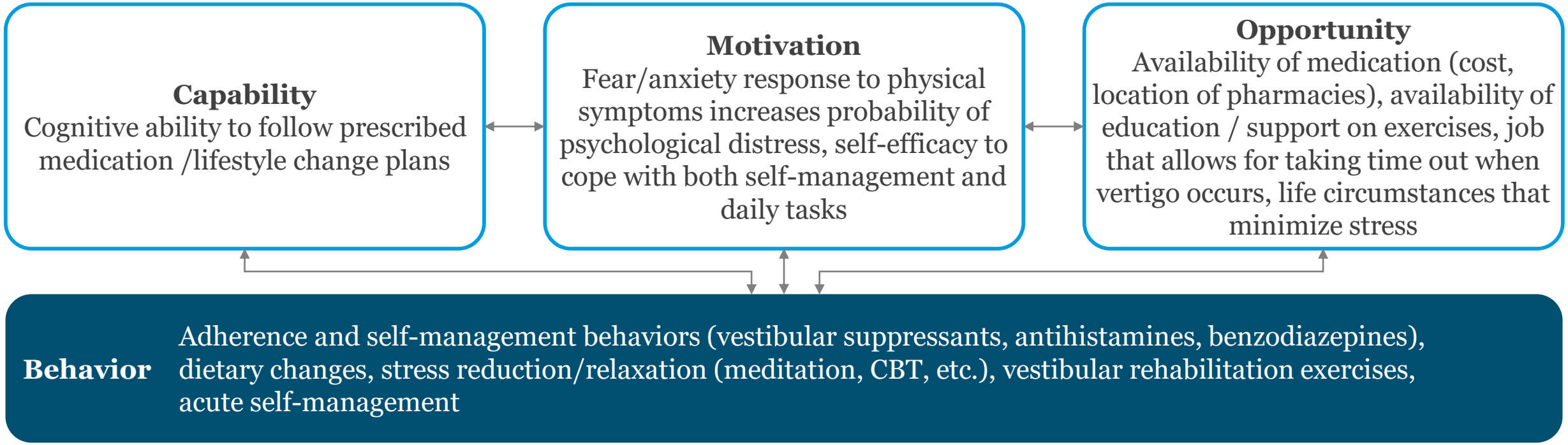
The COM-B model helps to explain the reasons why someone may engage in a particular behavior, by dividing them into 3 components that interact with each other



20. Holly F. Hope, George M. Binkley, Sally Fenton, George D. Kitas, Suzanne M. M. Verstappen and Deborah P. M. Symmons: Systematic review of the predictors of statin adherence for the primary prevention of cardiovascular disease , PLoS One, Jan 2019, [Accessed 26 June 2020], https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6336256/
21. Devin M. Mann, John P. Allegrante, Sundar Natarajan, Ethan A. Halm and Mary Charlson: Predictors of Adherence to Statins for Primary Prevention, Cardiovasc Drugs Ther, 1;21(4):311–6, Aug 2007, DOI: 10.1007/s10557-007-6040-4 [Accessed 26 June 2020], https://pubmed.ncbi.nlm.nih.gov/17665294
22. Ricky D. Turgeon, Todd J. Anderson, Jean Grégoire and Glen J Pearson: Updated guidelines for the management of dyslipidemia and prevention of cardiovascular disease by pharmacists, Can Pharm J (Ott, 148(1):21–8, Jan 2015, DOI: 10.1177/1715163514561256 [Accessed 26 June 2020], https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4294807/

Factors impacting capability, opportunity and motivation of vertigo patients to self-manage

The COM-B model helps to explain the reasons why someone may engage in a particular behavior, by dividing them into 3 components that interact with each other[23]



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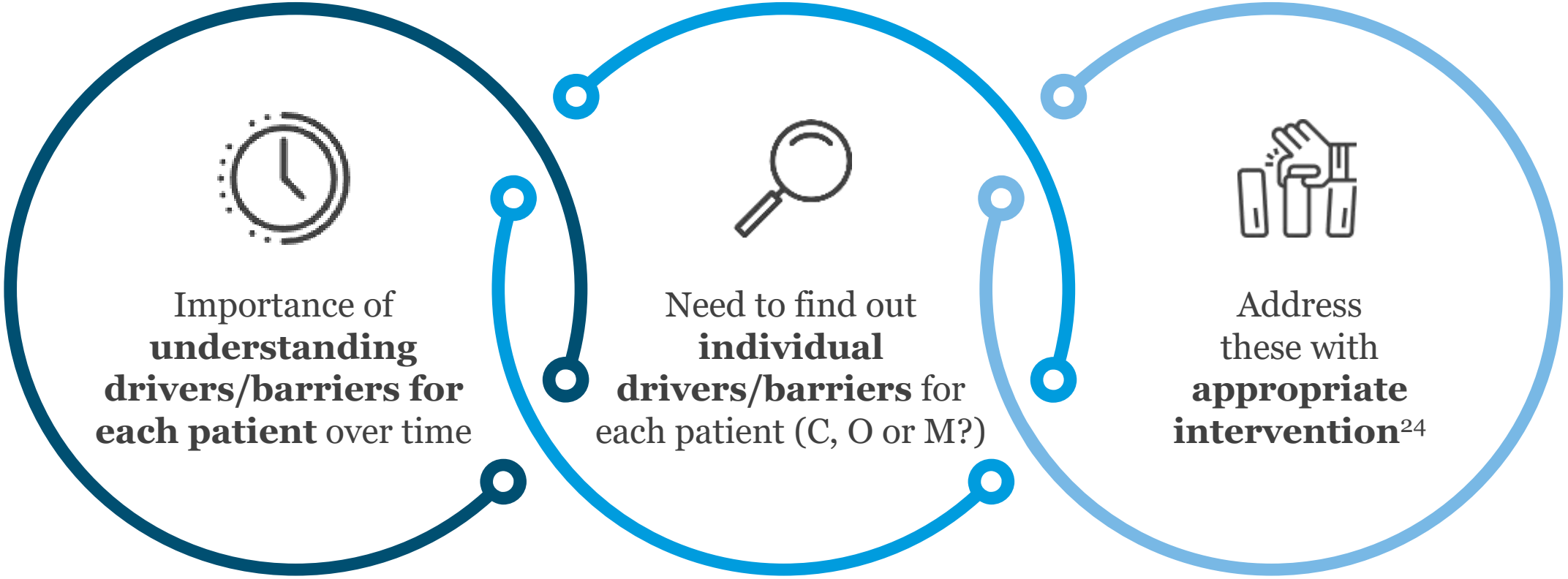

24. Samuel S. Allemann, Robby Nieuwlaat, Bart J.F. van den Bemt, Kurt E. Hersberger and Isabelle Arnet: Matching Adherence Interventions to Patient Determinants Using the Theoretical Domains Framework, Nov 2014, DOI: 10.3389/fphar.2016.00429 [Accessed 26 June 2020], https://pubmed.ncbi.nlm.nih.gov/27895583/

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Using the consultation to facilitate informed adherence

Check patient's understanding of treatment and, if necessary:

- Provide clear rationale for **necessity** of treatment
- Elicit and address **concerns**
- Agree practical plan for **how, where** and **when** to take treatment
- Identify any possible barriers

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