An update on the influences on medication adherence & recent developments to support patients: exploring the value of psychological theory

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Medication adherence: What’s the issue?

• World Health Organisation (WHO, 2003)
  ❖ 30-50% of patients taking medicines for chronic conditions are non adherent
  ❖ Worldwide problem of striking magnitude

• Clinical and economic consequences
  ❖ Additional investigations/treatments if undetected
  ❖ Increased morbidity and mortality
  ❖ Wasted resources
Medication adherence: What do we know?

• Complex behaviour with a plethora of influencing factors
  - Cognitive and physical impairments = practical barriers
  - Illness perceptions and health beliefs = perceptual barriers

• Treatment related factors e.g. regimen complexity
• Prescriber & healthcare related factors e.g. trust
• Patient related factors e.g. social support

• More complicated than just not taking medicines!
Medication adherence: Theories and models

• Beliefs about Medicines Questionnaire (BMQ) (Horne, Weinmann & Hankin, 1999)
  - Patients more likely to adhere if sense of necessity about medicine outweighs concerns

• Meta-analysis (Horne et al. 2013) of BMQ use in long-term conditions - higher adherence was associated with:
  - Stronger perceived necessity of treatment (OR = 1.742, 95% CI [1.569, 1.934], p = < 0.0001)
  - Fewer concerns about treatment (OR = 0.504, 95% CI [0.450, 0.564], p = < 0.0001)
Models of adherence
(Horne et al. 2005)

- Wide range of external and internal factors influential
- Important recognition of intention behaviour gap
Models of adherence (WHO, 2003)

- Five interacting dimensions of adherence
Interventions to improve medication adherence: Are we getting it right?

- Cochrane review (Nieuwlaat et al. 2014)
  - 182 RCTs: Only 5 improved both medication adherence & clinical outcomes
  - No single characteristic common to effective interventions
  - Modest improvements achieved at best
  - Lack of tailoring to meet individual need
  - Lack of grounding in psychological theory
Interventions to improve medication adherence: Common practice

• Routine care predominated by educational and behavioural interventions
  ❖ Effect size (Cohen’s d (95%CI)) for educational & behavioural interventions = 0.16 (0.08, 0.24) (Peterson et al. 2003)
  ❖ Effectiveness dependent on suitability and careful implementation
  ❖ Provision of multi-compartment adherence aids can lead to dangerous overdoses (Bhattacharya et al. 2016)
Interventions to improve medication adherence: Could we do better?

- Interest in using cognitive-based strategies
- Wide range of behaviour change techniques grounded in psychological theory:
  - Motivational interviewing & behaviour change counselling
  - Health coaching
  - Implementation Intention Interventions (if-then planning)
- Promising evidence for effectiveness
  - Effect size (95% CI) = 0.21 (0.08 to 0.33) (Easthall et al. 2013)
Interventions to improve medication adherence: Understanding it from the patients perspective

• Paternalistic traditions of the healthcare system are still evident in practice
  ❖ Over-reliance on educational-based interventions
  ❖ Provision of persuasive advice evokes further resistance to change (Miller and Rollnick 1991)
  ❖ Health beliefs and illness perceptions often overlooked
Moving forwards...

• To make progress with adherence research and interventions we need to:
  • Revisit psychology to better ground interventions in theory
  • Develop a robust strategy for tailoring interventions to meet individual needs
  • ...and **STOP** with the one-size fits all approach
Grounding adherence interventions in theory: Health psychology meets pharmacy practice

Theories of behaviour can be applied to medication adherence

- Self-Regulatory Model
- Theory of Planned Behaviour
- Health Belief Model
- Transtheoretical Model

The Health Belief Model (HBM) (Rosenstock et al 1988)

**Diagram:**
- Demographics (age, gender, socioeconomic status)
- Perceived susceptibility
- Perceived severity
- Health motivation
- Perceived benefits
- Perceived barriers/costs
- Cues to action
- Behaviour
A different approach: The Theoretical Domains Framework (TDF) (Michie et al. 2005, Cane et al. 2012)

- Composite of health psychology theory
- Key determinants of behaviour grouped into 12 theoretical domains
- Applied to different health related behaviours e.g. Smoking cessation, diet, physical activity (Francis et al. 2012)
The Behaviour Change Technique (BCT) Taxonomy (Michie et al. 2013)

• BCTs = ‘active ingredients’ of an intervention
• Taxonomy provides international consensus and a ‘common language’ to support intervention development
• 93 BCTs clustered into 16 groups

The Behaviour Change Wheel (BCW) (Michie et al. 2012, 2014)

• Integrates TDF and Taxonomy of Behaviour Change Techniques (BCTs) to enable tailoring of interventions to target behaviour
Capability, Opportunity and Motivation to adhere: The COM-B model (Michie et al. 2012)

• For an individual to undertake a **Behaviour** they must:
  - Be **Capable** of doing it
  - Have **Opportunity** to do it
  - Be **Motivated** to do it

• Capability and opportunity to adhere:
  - Practical impediments to adherence

• Motivation to adhere:
  - Influenced by perceptual barriers to adherence
  - Illness perceptions, health beliefs & emotions
TDF domains and COM-B components map on to each other:

<table>
<thead>
<tr>
<th>COM-B component</th>
<th>TDF Domain</th>
<th>E.g. adherence barrier</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CAPABILITY</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical</td>
<td>Skills (physical)</td>
<td>Swallowing difficulties</td>
</tr>
<tr>
<td>capability</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Psychological</td>
<td>Knowledge</td>
<td>Lack of knowledge</td>
</tr>
<tr>
<td>capability</td>
<td>Skills (cognitive &amp;</td>
<td>Lack of understanding</td>
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<tr>
<td></td>
<td>interpersonal</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Memory, attention &amp;</td>
<td>Forgetfulness</td>
</tr>
<tr>
<td></td>
<td>decisions</td>
<td></td>
</tr>
<tr>
<td>OPPORTUNITY</td>
<td>COM-B component</td>
<td>TDF Domain</td>
</tr>
<tr>
<td>------------------</td>
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<td>--------------------------------</td>
</tr>
<tr>
<td>Physical opportunity</td>
<td>Environmental context &amp; resources</td>
<td>Difficulties getting to pharmacy</td>
</tr>
<tr>
<td>Social opportunity</td>
<td>Social Influences</td>
<td>Lack of trust in GP</td>
</tr>
<tr>
<td>MOTIVATION</td>
<td>Reflective motivation</td>
<td>Beliefs about capabilities</td>
</tr>
<tr>
<td></td>
<td>Beliefs about consequences</td>
<td>Doubting necessity of medicines</td>
</tr>
<tr>
<td></td>
<td>Intentions &amp; goals</td>
<td>Lack of motivation</td>
</tr>
<tr>
<td></td>
<td>Emotion</td>
<td>Negative emotions</td>
</tr>
</tbody>
</table>
Pulling it all together...

<table>
<thead>
<tr>
<th>Problem behaviour</th>
<th>TDF domain</th>
<th>COM-B component</th>
<th>Appropriate intervention (BCT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient is non-adherent as they do not know how to use their inhaler correctly</td>
<td>Knowledge/skills</td>
<td>Psychological capability</td>
<td>6.1  Demonstration of the behaviour</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>8.1  Behavioural practice/rehearsal</td>
</tr>
<tr>
<td>Patient is non-adherent as they don’t believe their inhaler will work</td>
<td>Beliefs about consequences</td>
<td>Reflective motivation</td>
<td>2.5  Monitoring of outcomes of behaviour</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5.1  Information about health consequences</td>
</tr>
</tbody>
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But how do we identify the problem behaviours?...
Applying the TDF to medication adherence

- Novel adherence intervention
  - Grounded in theory and targeted to address **questionnaire identified** barriers to adherence using TDF and BCW
  - Delivered by routine healthcare providers including pharmacists?

Diagram:

1. Questionnaire development
2. Questionnaire validation
3. Intervention development
4. Feasibility study
5. Definitive trial

- Implementation research
- Barriers to behaviour change at the practitioner level
Identification
- Phase 1: Identification of medication adherence barriers
- Literature search of barriers to medication adherence in chronic conditions
- Medication adherence barriers extracted & collated

Mapping
- Phase 2: Mapping of medication adherence barriers to the domains of TDF
- Adaptation of TDF to reflect context of medication adherence and mapping
- Multistage process involving three researchers (two pharmacists and one psychologist)

Consultation
- Phase 3: Consultation with patients prescribed meds for the prevention of CV disease
- Discussion of relevance and of meaning of identified adherence barriers
- Audio-recorded, transcribed and analysed according to behavioural domains of the TDF

Refinement
- Phase 4: Reflection and refinement of adherence barrier mapping
- Finding from consultation exercises used to refine mapping process
- Additional barriers from consultation exercises added

Questionnaire development
- Phase 5: Development of the Identification of Medication Adherence Barriers Questionnaire (IMAB-Q)
- Multistage, iterative process involving patient, practitioner and expert opinion
Mapping of medication adherence barriers to the ‘emotions’ domain of the TDF (Easthall et al. 2013b)

- Feeling **HOPELESS**, TIRED or OVERWHELMED
- Feeling **LOW** or **DEPRESSED**
- Feeling **ANGRY** or **STRESSED**
- Treatment being a **REMINDER** of illness
- Wanting to be **FREE** of taking medicines
- Thinking of treatment as a **BURDEN**
- **EMBARRASSMENT** of taking medicines
Consultation work to explore the ‘emotions’ domain of the TDF (Easthll et al. 2013b)

• Participants could identify with the emotional barriers discussed and confirmed their potential to impede adherence

Female aged 57, 2 regular medicines
"I had three big carrier bags full of medicines to collect; I was so embarrassed I tried to hide them in my coat, I didn't want anybody to see or wonder what I'd got!"

Male aged 81, 1 regular medicine
“Having to take medicines for the rest of your life, especially if you’re young could be quite depressing, I can see how it could put people off”
Consultation work to explore the ‘emotions’ domain of the TDF (Easthall et al. 2013b)

- Additional barriers such as ‘annoyance’ and ‘frustration’ were also suggested

Male aged 55, 2 regular medicines
“\textit{I get frustrated by things like having to declare my medicines to the DVLA}”

Male aged 78, 4 regular medicines
\textit{“Taking several medicines is a real pain when it comes to things like holiday insurance forms, it makes quite a big difference to the cost which is annoying”}
Identification of Medication Adherence Barriers Questionnaire (IMAB-Q)

- 30 item questionnaire
  - 3 statements per behavioural domain
- Grounded in psychological theory
- Established face validity
- Pharmacy Research UK Grant
  - Test feasibility of use
  - Gather data for psychometrics
  - Explore barriers to implementation

Questionnaire can be accessed via UEA website:
https://www.uea.ac.uk/pharmacy/research/imab-q/quest
Preliminary findings from IMAB-Q validation work

- 1407 questionnaires distributed across 9 community pharmacies
  - 608 (43.2%) returned with a valid consent form AND completed responses to all 30 IMAB-Q items
- Mean (95% CI) IMAB-Q score = 50.27 (49.35, 51.18)
- Visual analogue scale (VAS) for adherence assessment
  - Valid response from 94.1% of respondents
  - Median (IQR) score = 97 (94, 99)

<table>
<thead>
<tr>
<th>Adherence assessment</th>
<th>Mean (95% CI) IMAB-Q score</th>
</tr>
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<tbody>
<tr>
<td>&lt; 80% on VAS</td>
<td>56 (52, 60)</td>
</tr>
<tr>
<td>&gt; 80% on VAS</td>
<td>50 (49, 51)</td>
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</tbody>
</table>

Participants reporting poor adherence (< 80% on VAS) reported greater barriers to adherence compared to participants reporting good adherence (> 80% on VAS). This difference was statistically significant $p = 0.016$, (Independent Samples t-test).
### Preliminary findings: Mean scores per behavioural domain

<table>
<thead>
<tr>
<th>Behavioural domain</th>
<th>Mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skills</td>
<td>4.32 (1.38)</td>
</tr>
<tr>
<td>Motivation</td>
<td>4.39 (1.53)</td>
</tr>
<tr>
<td>Knowledge</td>
<td>4.50 (1.46)</td>
</tr>
<tr>
<td>Environmental constraints</td>
<td>4.52 (1.54)</td>
</tr>
<tr>
<td>Memory, attention &amp; decision making</td>
<td>4.64 (1.66)</td>
</tr>
<tr>
<td>Goal conflicts</td>
<td>4.82 (1.73)</td>
</tr>
<tr>
<td>Social influences</td>
<td>5.14 (1.69)</td>
</tr>
<tr>
<td>Beliefs about capabilities</td>
<td>5.32 (1.64)</td>
</tr>
<tr>
<td>Emotions</td>
<td>6.08 (2.52)</td>
</tr>
<tr>
<td>Beliefs about consequences</td>
<td>6.57 (1.74)</td>
</tr>
</tbody>
</table>

- Emotions and beliefs about consequences are notable barriers to medication adherence.
- Both domains fall within the ‘motivation’ section of COM-B model.
- How often do we talk to patients about these aspects?
Continuation of the TDF and IMAB-Q work

Data analysis complete, PRUK report submission, paper in preparation

- Which BCTs are effective in practice?
- Update systematic review and meta-analysis and use BCT taxonomy to code interventions

Disease specific adaptations

Validation in different populations e.g. Australia

- Implementation research
- Barriers to behaviour change at the practitioner level

Educational project: Are we providing our undergraduates with sufficient training to confidently utilise behaviour change techniques in practice?

What about post-graduate CPD?
Conclusions

• Medicines taking is a complex health behaviour
  ❖ Wide range of influences and determinants

• Adherence interventions need to be targeted to address individual factors which influence non-adherence
  ❖ One size fits all approach won’t work
  ❖ Wrong intervention can do more harm than good!
  ❖ TDF and COM-B model bring theory and intervention targeting together

• Patient-centred approaches recognise patient perspective
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References

References


