Exercise: adherence (FS-09)

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Exercise adherence: integrating theory, evidence and behaviour change techniques

Jean Hay-Smith PhD, Sarah Dean PhD, Helena Frawley PhD, Doreen McClurg PhD
Learning objectives

We will cover:

- Why (long-term) exercise adherence is difficult
- How theory helps us understand adherence
- Why applying theory needs context-specific knowledge

You will be able to

- Identify one or more behaviour change techniques that might support patients’ exercise adherence in your practice
Sarah Dean

Why (long-term) exercise adherence is difficult

Sarah Dean’s position is supported by the National Institute for Health Research (NIHR) Collaboration for Leadership in Applied Health Research and Care (CLAHRC) for the South West Peninsula. The views expressed in this presentation are those of the author(s) and not necessarily those of the NHS, the NIHR or the UK Department of Health.
Definitions

- **Activity** is any bodily movement produced by skeletal muscles that results in energy expenditure and is usually measured in kilocalories per unit of time (Caspersen et al., 1985)

- **Exercise** is a sub-set of physical activity and is planned, structured, repetitive bodily movements that someone engages in for the purpose of improving or maintaining physical fitness or health
Physical Activity and Exercise

Physical activity

Exercise

Cardio respiratory

Strengthening

PFMT

Activity

Work, play, travel, recreation
Definitions (see Sabatâe, 2003; Myers & Midence, 1998)

- Compliance – being told what to do
- Adherence – agreeing what to do
- Concordance – therapeutic alliance and shared decision making
- Intentional versus Unintentional
Phases of Exercise Adherence

- Initial uptake
- Adoption of main routine
- Maintenance routine
- Relapse management
Long term adherence to exercise based rehabilitation interventions for the management of chronic conditions is typically very poor:

- Low back pain (e.g. Sluijs et al, 1993)
- Cardio vascular rehab (e.g. Jurkiewicz et al, 2011)
- Urinary incontinence (e.g. Borello-France et al, 2013)
Why is (longer term) exercise adherence such a problem? (see Myers & Midence 1998)

- People often ‘know’ what to do – but there is a large ‘knowledge-behaviour’ gap
- Initial take up (often in a supported treatment setting) does not translate into daily routine
- People relapse and don’t resume their exercises
Common myths

- There is no ‘adherent’ personality
- Adherence is not ‘all or nothing’
- Non-adherers do not ‘just need more education’
Core concepts

- Treatment adherence typically requires health behaviour change

- Adherence is an outcome as well as a process – the ‘healthy adherer’ effect (see Simpson et al, 2006)
Core concepts

- Measuring adherence is difficult – there is no gold standard (see Bollen et al, 2014)

- Most people are willing to report being partially adherent, some are over-adherent

- Difficult to be clear about what level of adherence is required to obtain therapeutic benefit
Explaining Adherence

- Many theories or models exist to help us explain (non) adherence
- No one theory explains the whole story....
- We have selected several to focus on today.....
How theory helps us understand adherence

Determinants

Doreen McClurg

Glasgow Caledonian University, Glasgow, UK G4 0BA
A Theory?

a coherent description of a process that is arrived at by a process of inference, provides an explanation for observed phenomena and generates predictions (West & Brown, 2013).

Good practice to take a clinical history but this is meaningless unless we also appreciate the impact of the history on the symptoms the patient presents with.

“He who loves practice without theory is like the sailor who boards ship without a rudder and compass and never knows where he may cast.” (Leonardo Da Vinci, 1452-1519)

It is strongly recommended that interventions to change health behaviours, including those that promote treatment adherence, are based on a theoretical model which provides an explanation of that behaviour. (Campbell 2001, Ommundsen 2001)

In the UK, the Medical Research Council recommends beginning the development of any complex intervention by identifying relevant theories to advance an understanding of the likely process of change before conducting any exploratory piloting and formal testing (Campbell et al., 2000)
Theoretical models and PFMT
(McClurg et al 2015)

- Exercise is a health behaviour
- Adherence is crucial to successful PFMT
- A literature review of studies that identified theories of health behaviour and PFMT
- 13 papers, 6 models applied in PFMT research
- Poster RR-PO-99-23-Sat
## Theories used in PFMT

<table>
<thead>
<tr>
<th>Theory</th>
<th>Referenced by</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Health Belief Model</strong></td>
<td>Chiarelli and Cockburn (1999)</td>
</tr>
<tr>
<td></td>
<td>Dolman and Chase (1996)</td>
</tr>
<tr>
<td></td>
<td>Sacomori et al (2012)</td>
</tr>
<tr>
<td><strong>Theory of Planned Behaviour</strong></td>
<td>Whitford and Jones (2011)</td>
</tr>
<tr>
<td>(Ajzen, 1991)</td>
<td></td>
</tr>
<tr>
<td><strong>Social Cognitive Theory : Self-Efficacy Beliefs</strong></td>
<td>Chen (2004); Cheng (2010), Lai (2008), Hallam (2012), Hay-Smith, Ryan and Dean (2007), Alewijnse et al. (2003), Messer et al. (2007)</td>
</tr>
<tr>
<td>(Bandura, 1986)</td>
<td></td>
</tr>
<tr>
<td><strong>Transtheoretical Model</strong></td>
<td>Alewijnse (2002; 2003)</td>
</tr>
<tr>
<td>(Prochaska &amp; DiClemente, 1983)</td>
<td></td>
</tr>
<tr>
<td><strong>Self-Regulatory Model</strong></td>
<td>Alewijnse (2002; 2003)</td>
</tr>
<tr>
<td>(Leventhal, Meyer &amp; Nerenz; 1980)</td>
<td></td>
</tr>
<tr>
<td><strong>Health Action Process Approach</strong></td>
<td>Hyland (2012)</td>
</tr>
<tr>
<td>(Schwarzer, 1992)</td>
<td></td>
</tr>
</tbody>
</table>
Health Belief Model  
(Rosenstock & Becker, 1988: 1974)

Chiarelli and Cockburn 1999
Gillard and Shamley 2010
Dolman and Chase 1996
Sacomori et al 2012
Social Cognitive Theory: Self-Efficacy Beliefs
(Bandura, 1986)

- Broom (1991, 2001); Chen (2004); (SE Scales)
- Cheng (2010); Lai (2008); Hallam (2012)
- Hay-Smith, Ryan and Dean (2007); Alewijnse et al. (2003)
- Messer et al. (2007)
## Determinants of adherence *(Dumoulin et al 2015)*

<table>
<thead>
<tr>
<th>Population</th>
<th>Determinants (Moderators &amp; Mediators)</th>
<th>Strategies</th>
</tr>
</thead>
</table>
| **Women with Urinary Incontinence (UI)** Alewijnse Chen | Positive intention to adhere  
Amount of urine lost (i.e. symptom level)  
Self efficacy expectations  
Attitudes towards the exercises  
Perceived social pressure to engage  
Dyadic cohesion (i.e. feedback) | A structured programme  
Enthusiastic physiotherapist  
Audio prompts  
Use of established theories of behaviour change  
User consultation |
| **Men with UI** Ip 2004 | No studies | Reminders on fridge magnets |
| **Pre & Post natal UI** Chiarelli and Cockburn (2002) | No studies | Health belief model tailoring PFM to function and time |
| **Pelvic Organ Prolapse** | No studies | None |
| **Lower Bowel Dysfunction** | No studies | None |
# Motivational interventions to exercise and traditional physiotherapy

*McGrane et al 2015*

<table>
<thead>
<tr>
<th>14 papers</th>
<th>6 theories</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 MSK pain</td>
<td>4 CBT</td>
</tr>
<tr>
<td>4 obesity</td>
<td>3 Social cognitive</td>
</tr>
<tr>
<td>3 cardiac rehabilitation</td>
<td>3 Motivational Interviews</td>
</tr>
<tr>
<td>1 fatigue with cancer</td>
<td>1 Self-determination</td>
</tr>
<tr>
<td>1 sedentary females</td>
<td>1 Transtheoretical</td>
</tr>
<tr>
<td></td>
<td>1 Social Learning</td>
</tr>
</tbody>
</table>

Self-efficacy was pooled in 6 studies, (CBT, Mot Int, Soc Cog, Self Deter) sig improvement in self-efficacy
Summary

- Motivational interventions/theories to improve exercise adherence have received relatively little research.
- The same theory can be applied in more than one setting.
- Specifics of understanding which variables are most influential may be context specific. Helena is going to talk more about that........
Helena Frawley

Why applying theory needs context-specific knowledge
Everything, even Evidence-Based-Practice, happens in context….

Figure from: Spring & Hitchcock, 2009
Five interacting dimensions affect adherence (WHO 2003)

Figure from:
http://apps.who.int/medicinedocs/en/d/Js4883e/7.2.html#Js4883e.7.2.1
our Pelvic Floor Muscle Training adherence survey (Frawley et al 2015)

<table>
<thead>
<tr>
<th>BARRIERS</th>
<th>Options</th>
<th>Clinician rating n=513</th>
<th>Patient rating n=50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical / condition-related factors</td>
<td>other co-existing health issues which take priority</td>
<td>1 (76%)</td>
<td>1 (68%)</td>
</tr>
<tr>
<td>Patient-related factors</td>
<td>low level of motivation</td>
<td>1 (83%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>perception of minimal benefit / effectiveness of the exercises</td>
<td></td>
<td>1 (81%)</td>
</tr>
<tr>
<td>Therapy-related factors</td>
<td>lack of immediacy of beneficial effects, ineffective feedback of performance</td>
<td>1 (77%)</td>
<td></td>
</tr>
<tr>
<td>Social / economic factors</td>
<td>lack of effective support networks to reinforce adherence</td>
<td>1 (68%)</td>
<td>1 (74%)</td>
</tr>
<tr>
<td></td>
<td>poor response to previous treatment (may have been ineffective treatment)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
our PFMT adherence survey  (Frawley et al 2015)

<table>
<thead>
<tr>
<th>BARRIERS</th>
<th>Options</th>
<th>Clinician rating</th>
<th>Patient rating</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Which category is the single most important barrier?</strong></td>
<td>Patient-related factors</td>
<td>1 (66%)</td>
<td>1 (56%)</td>
</tr>
<tr>
<td></td>
<td>Therapy-related factors</td>
<td>2 (17%)</td>
<td>2 (20%)</td>
</tr>
<tr>
<td><strong>What is single most important barrier to SHORT-TERM adherence?</strong></td>
<td>low level of motivation</td>
<td>1 (16%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>perception of minimal benefit / effectiveness of the exercises</td>
<td>2 (14%)</td>
<td>1 (20%)</td>
</tr>
<tr>
<td></td>
<td>lack of understanding or knowledge about the condition</td>
<td>2 (12%)</td>
<td></td>
</tr>
<tr>
<td><strong>LONG-TERM adherence?</strong></td>
<td>forgetting to do exercises</td>
<td>1 (23%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>perception of minimal benefit / effectiveness of the exercises</td>
<td>1 (16%)</td>
<td></td>
</tr>
</tbody>
</table>
### our PFMT adherence survey *(Frawley et al 2015)*

<table>
<thead>
<tr>
<th>FACILITATORS</th>
<th>Options</th>
<th>Clinician rating n=513</th>
<th>Patient rating n=50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical / condition-related factors</td>
<td>severity of symptoms: mild – moderate</td>
<td>1 (68%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>no / minimal other co-existing health issues competing for priority</td>
<td></td>
<td>1 (71%)</td>
</tr>
<tr>
<td>Patient-related factors</td>
<td>high degree of motivation</td>
<td>1 (93%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>perception of significant benefit / effectiveness of the exercises</td>
<td></td>
<td>1 (90%)</td>
</tr>
<tr>
<td>Therapy-related factors</td>
<td>patient-therapist relationship: good rapport, interaction motivates patient</td>
<td>1 (87%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>provide immediate beneficial effects (even if small)</td>
<td></td>
<td>1 (88%)</td>
</tr>
</tbody>
</table>
**our PFMT adherence survey** (Frawley et al 2015)

<table>
<thead>
<tr>
<th>FACILITATORS</th>
<th>Options</th>
<th>Clinician rating</th>
<th>Patient rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Which category is the single most important facilitator?</td>
<td>Patient-related factors</td>
<td>1 (60%)</td>
<td>2 (37.5%)</td>
</tr>
<tr>
<td></td>
<td>Therapy-related factors</td>
<td>2 (34%)</td>
<td>1 (55%)</td>
</tr>
<tr>
<td>What is single most important facilitator to SHORT-TERM adherence?</td>
<td>perception of significant benefit / effectiveness of the exercises</td>
<td>1 (19%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>high degree of motivation</td>
<td></td>
<td>1 (20%)</td>
</tr>
<tr>
<td>LONG-TERM adherence?</td>
<td>perception of significant benefit / effectiveness of the exercises</td>
<td>1 (21%)</td>
<td>1 (15%)</td>
</tr>
</tbody>
</table>
Clinical Recommendations

1. Patient-related factors may be the most important category of barriers to long-term PFMT adherence; these may include the patient’s perception of minimal benefit of the therapy, reduced self-efficacy, poor identification with pelvic anatomy, and understanding of the condition, all of which may lead to low motivation to adhere to PFMT. Health professionals need to identify and address these factors.

2. Patient- and therapy-related factors may optimally facilitate long-term adherence; health professionals need to provide tangible evidence or feedback to patients on PFMT benefits.

3. Long-term adherence may be best achieved through follow-up appointments and a re-assessment of factors impeding progress; determinants may change over time.

4. An individualized approach to treatment based on a person’s age, sex, and ethnicity is recommended.

5. The belief that PFMT adherence determinants differ according to condition is not strongly supported; therefore, individualized patient-centered, as opposed to condition-centered, approaches are recommended.
Remember

Change is difficult!

Figure from:
Stages of Change
(Grol 2013)
Aware \rightarrow Agree \rightarrow Adopt \rightarrow Adhere

Figure from Grol 2013
See Pathman et al 1996
Attrition in the ‘pipeline’ of research to practice (Glasziou 2004)
Barriers and Enablers
# Barriers & Enablers

(Rainbird 2006)

<table>
<thead>
<tr>
<th>Level</th>
<th>Type of barrier or enabler</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>The innovation itself</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Individual professional</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patient</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social context</td>
<td></td>
<td></td>
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<tr>
<td>Organisational context</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Economic &amp; political context</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Level</td>
<td>Type of barrier or enabler</td>
<td>Examples</td>
</tr>
<tr>
<td>------------------------------</td>
<td>----------------------------</td>
<td>--------------------------------------------------------------------------</td>
</tr>
<tr>
<td>The innovation itself</td>
<td>- Advantages in practice</td>
<td>- CPGs may be perceived as difficult to use</td>
</tr>
<tr>
<td></td>
<td>- Feasibility</td>
<td>- CPGs which recommend discarding may be more difficult than introducing</td>
</tr>
<tr>
<td></td>
<td>- Credibility</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Accessibility</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Attractiveness</td>
<td></td>
</tr>
<tr>
<td>Individual professional</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patient</td>
<td></td>
<td></td>
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<tr>
<td>Social context</td>
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<td>Examples</td>
</tr>
<tr>
<td>-------------------------------</td>
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<td>-----------------------------------------------</td>
</tr>
<tr>
<td>The innovation itself</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Individual professional</td>
<td>- Awareness</td>
<td>- Knowledge - Attitude - Motivation to change</td>
</tr>
<tr>
<td></td>
<td>- Behavioural routines</td>
<td></td>
</tr>
<tr>
<td>Patient</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social context</td>
<td></td>
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<tr>
<td>Organisational context</td>
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<td></td>
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<tr>
<td>Economic &amp; political context</td>
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</table>
Phases in the process of change

(Grol 2013)

- **Orientation:**
  - awareness of innovation
  - interest and involvement

- **Insight:**
  - understanding
  - insight into own routine

- **Acceptance:**
  - positive attitude, motivation to change
  - positive intention or decision to change

- **Change:**
  - actual adoption in practice
  - confirmation of benefit or value of change

- **Maintenance:**
  - integration of new practice into routines
  - embedding of new practice in the organisation
Translating Research Into Practice project
(Frawley et al 2014)
Jean Hay-Smith

- Why applying theory needs context-specific knowledge
- Identify one or more behaviour change techniques that might support patients’ exercise adherence in your practice

www.opaltrial.co.uk
Planning the OPAL intervention

- Health behaviour theory
- OPAL intervention
- Existing PFMT protocol
- Qualitative evidence synthesis
- Behavioural change techniques
Information Motivation Behavioural Skills Model (IMB) (Fisher et al. 2003)
Context: the qualitative synthesis


- Knowledge
- Feelings about PFMT
- Physical skill
- Cognitive analysis, planning and attention
- Prioritisation
- Service provision
IMB Model and synthesis

Knowledge -> Physical skill -> Health behaviour

Cognition, Feelings, Priority, Services
Behaviour change techniques (BCTs) (Michie et al. 2013)

- 93 item taxonomy
- Naming active ingredients of delivery
- Applicable to many health behaviours
- Choose for context
Item 74: Credible source

Present verbal or visual communication from a credible source in favour of the behaviour

"your doctor has referred you to me because I am an expert in pelvic floor muscle exercises. I have worked in this area for 20 years and have done extra training to help women with incontinence"
Item 41: Mental rehearsal of successful performance

Advise to practice imagining performing the behaviour successfully in relevant contexts.

“I will pull my muscles up as hard as I can. I will hold as hard as I can. I will keep breathing while I count 1 banana 2 banana 3 banana 4 banana 5 banana and then I will let go. I will rest while I count ..... etc”
Item 71: Behavioural contract

- Very familiar with goal setting for the behaviour (Item 66)
- Add, item 71. Create a written specification of the behaviour to be performed, agreed by the person, and witnessed by another
We have

- Briefly explained:
  - Why long-term exercise adherence is difficult
  - How theory helps us understand adherence
  - Why applying theory needs context-specific knowledge

- Referred to a 93 item taxonomy of behaviour change techniques and given 3 specific examples used to support exercise adherence
Questions – Panel – 20 minutes

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Head, Allied Health Research, Cabrini Institute
National Health & Medical Research Council (Australia) Health Professional Research Fellow
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Associate Professor, Women’s Health
University of Otago
New Zealand
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Good quality information provision is an important platform for promoting adherence but more information alone is not enough to change behaviour, instead:

- Use your credibility as a professional / expert in the area (BCT ‘credible source’)
- Check and address any information misconceptions (BCT ‘information about health consequences’)

Sarah Dean
Promote motivation through goal setting and action planning if-then rules.

Boost self-efficacy.

Work out a relapse strategy.

Ensure patient has necessary behavioural skills correct exercise technique a regimen to follow that allows progression and relapse management skills and equipment to self-monitor or review progress.
To summarise

- Aim for sufficient partial adherence to obtain therapeutic benefit
- Help patients establish routines, so that exercises are part of their daily life
- Don’t let exercises be a burdensome additional ‘interruption’ to their lives
References - Helena

- WHO 2003: Adherence to Long-Term Therapies - Evidence for Action http://apps.who.int/medicinedocs/en/d/Js4883e/7.2.html#Js4883e.7.2.1
References - Sarah

References - Doreen


Gillard S, Shamley D. Factors motivating women to commence and adhere to pelvic floor muscle exercises following a perineal tear at delivery: the influence of experience. 2010;5–18.


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Sacomori C, Cardoso FL. Teaching Pelvic Floor Muscle Exercises to Women in a Primary Care Setting: Participants’ Adherence and Acceptance. J. Yoga Phys. Ther. [Internet]. 2012 [cited 2013 Sep]


References - Jean

