Adherence & Exercise for people living with HIV 2014

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Adherence to exercise for PwHIV (observations)

- Some PwHIV LOVE exercise and others do not
- Some PwHIV start off really motivated (& adherent) then trail off
- Generally, adherence falls below what is recommended

- We want to know…

  - WHY!!!
  - Who is more likely to be non-adherent
  - Do certain factors predict adherence behaviours?

- …So that we can develop targeted intervention strategies & optimise adherence/attendance for everybody!

1st stage: Observational study: Petróczi *et al*. 2010

- **Aim**
- To identify characteristics influencing adherence behaviours to prescribed exercise for PwHIV

- **Results**
- Age, gender, baseline CD4 + fitness level + reason for referral did not differentiate 'adherent' v 'non-adherent' groups whereas perceived well-being & ethnicity did *

- **Conclusions**
- Perceived well-being appears to differentiate between adherent & non-adherent PwHIV. Ethnicity may play an influential role.

- **Recommendations**
- Further studies are needed to investigate other psychological characteristics & barriers to maintaining exercise…

The Open AIDS Journal, 2010, 4, 148-155.

2nd stage: Observational study: Jones *et al.* 2012

- Aim

  "To investigate ***psychological*** and ***socioeconomic*** factors that lead to *adherence/non-adherence* to exercise programmes and medical treatment in PwHIV"

- Using the 'Theory of Planned behaviour'

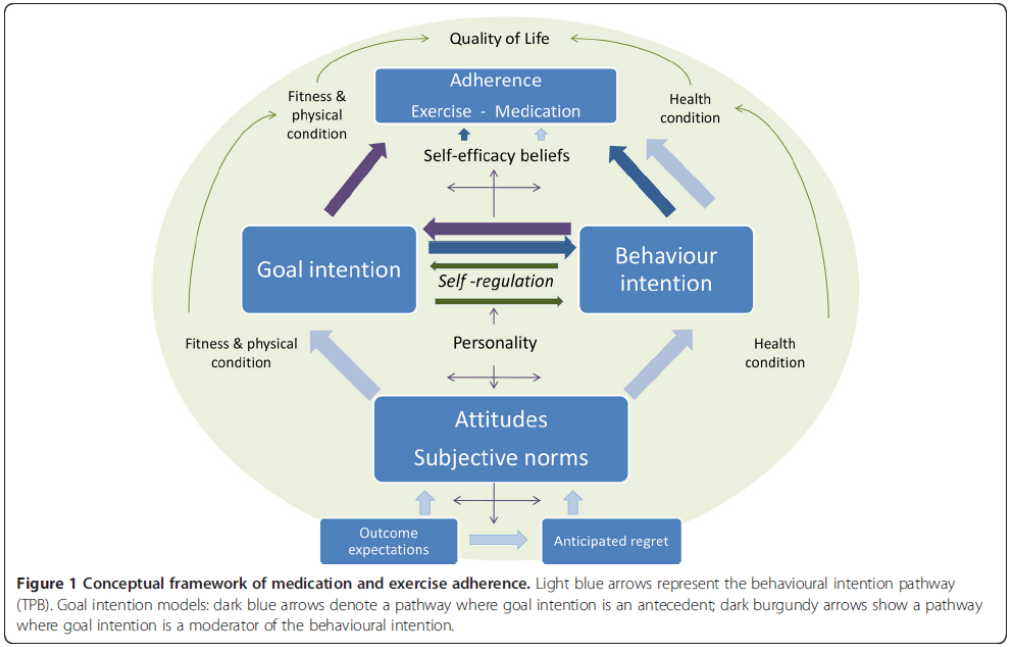

Figure 1 Conceptual framework of medication and exercise adherence. Light blue arrows represent the behavioural intention pathway (TPB). Goal intention models: dark blue arrows denote a pathway where goal intention is an antecedent; dark burgundy arrows show a pathway where goal intention is a moderator of the behavioural intention.

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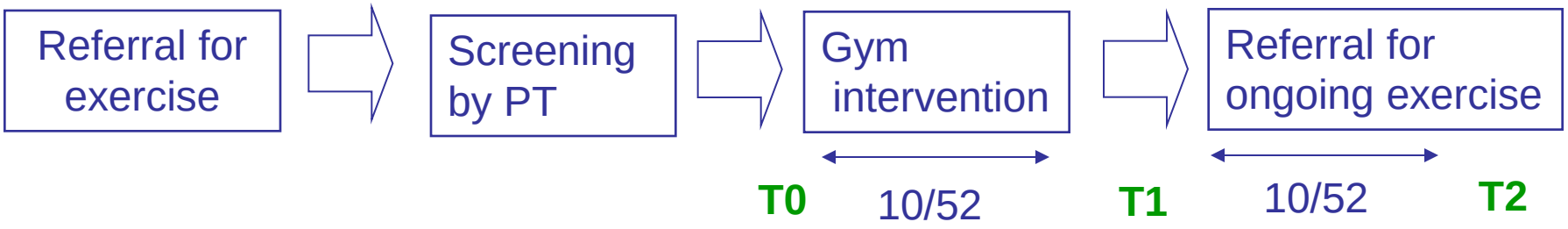
Novel aspects of this trial

1. Outcome measures are collected whether or not the participant attends their available exercise sessions

2. The project assesses beliefs about both the underlying goal and specific behaviours

3. Beliefs and adherence markers are united

Trial pathway



Outcome measurements

- **Questionnaires**
- **Computer based test**
- **FAHI, standard physical assessment including anthropometrics, 1RM + 6mwt**
- **+ hair sample @ T2**

Adherence markers for exercise and medication	
Exercise	Medication
Objective marker: Number of sessions attended (/ 20)	**Objective marker:** Hair sample analysis
Subjective marker: self-report including exercise diary	**Subjective marker:** Self-report
Factors contributing to exercise & medication adherence	
Implicit & explicit attitudes •Goal (following PT's orders) •Behaviour (attending exercise sessions) •Also- intention, subjective norms, self-efficacy	**Implicit & explicit attitudes** •Goal (following Dr's orders) •Behaviour (taking medication) •Also- intention, subjective norms, self-efficacy

Results

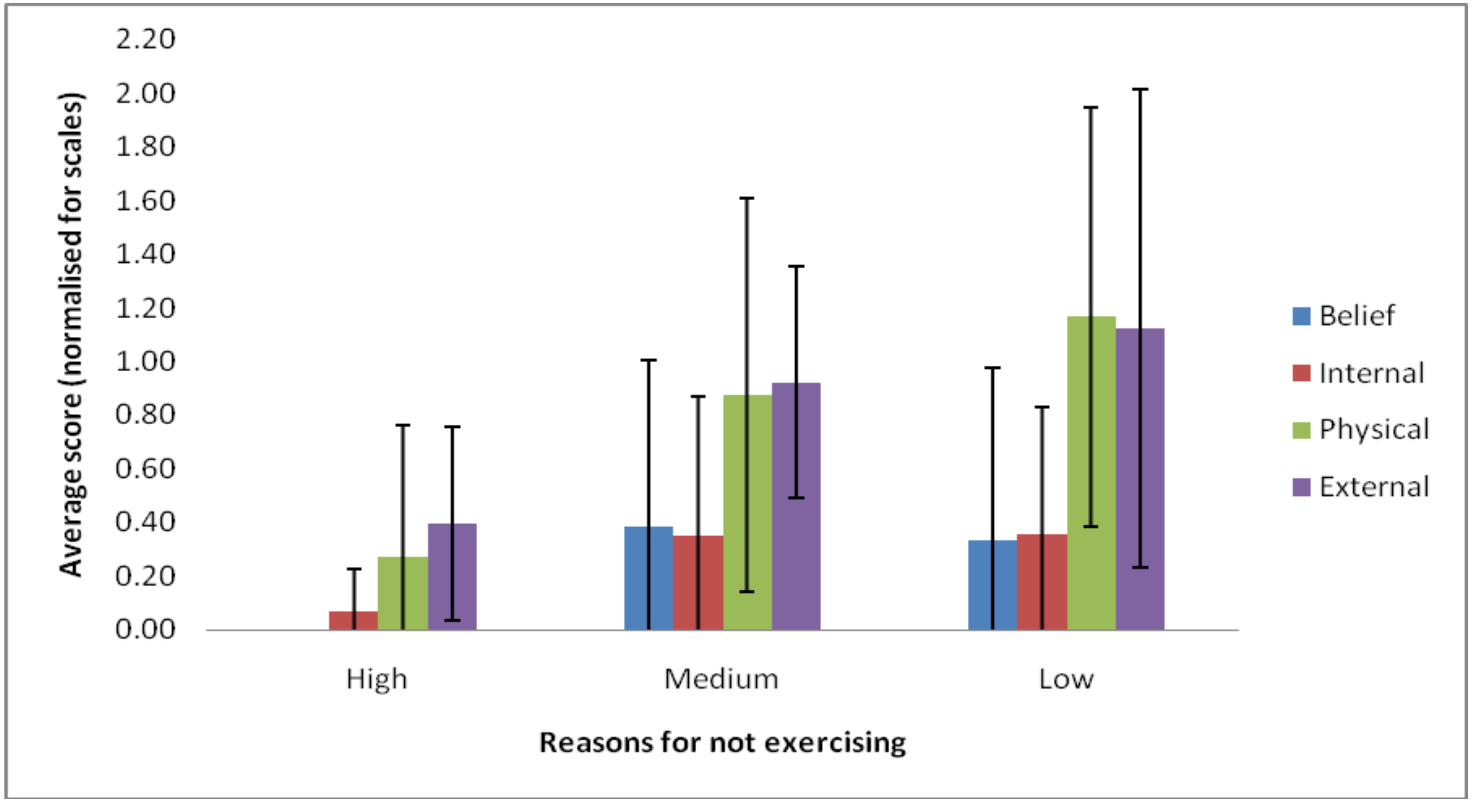
- **Subjects**
- **38 completed 3 x sets of outcome measures**
  - **55 suitable**
  - **39 unsuitable**
  - **12 declined**
  - **43 recruited**
  - **4 dropped out**
  - **Approx equal split MSM/SSA**

- **Sample Characteristics**
- **Age (years)**
  - **Mean** **44.53**
  - **SD** **6.54**
  - **Range** **32-55**
- **Gender:** **65% Male**
- **Attendance**
  - **Low (0-6)** **10**
  - **Medium (7-12)** **14**
  - **High (14-20)** **14**
- **NO age or gender differences between the 3 attendance groups**

Reasons for not doing exercise

- **Belief based reasons for not doing exercise**
  - Disagree with reasons for exercising
  - Feel doing exercise is pointless
  - Did not feel desired effect of exercise
- **Internalised justifications for non-attendance related to exercise itself**
  - Don't like the gym
  - Embarrassment
  - Uncomfortable in gym clothes
  - Alien environment
- **Physical barriers independent of exercise**
  - Felt tired
  - Felt overwhelmed/ depressed
  - Felt ill/sick
  - Were injured
- **External reasons independent of exercise**
  - Away from home
  - Busy with other things
  - Family/work commitments
  - Forgot
  - Personal problems

Reasons for not doing exercise @ 10 week/ completion of group



What next?!

- **Current trial:**
  - Full data analysis + conclusions
  - Disseminate (papers and presentations)

- **Next phase trial:**
  - Refine data collection – streamlined protocol based on results
  - Next phase of trial- identify strategies to increase recruitment.

- **Long term goals:**
  - Identify beliefs which influence intention to exercise/take medication in HIV.
  - Develop interventions which aim to modify beliefs responsible for poor adherence patterns

That's a taster… But there's more!

Webinar:	http://www.wcpt.org/ipt-hope
Date:	20th November 2014
Time:	12pm EST (5pm GMT in November!)

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HEALTH BEHAVIOR, HEALTH PROMOTION AND SOCIETY Open Access

Understanding how adherence goals promote adherence behaviours: a repeated measure observational study with HIV seropositive patients

Gareth Jones[1], Kim Hawkins[2], Rebecca Mullin[3], Tarnia Nepusz[3], Declan P Naughton[3], Paschal J Sheeran[4] and Andrea Petroczi[3]*

Abstract

Background: The extent to which patients follow treatments as prescribed is pivotal to treatment success. An exceptionally high level (> 95%) of HIV medication adherence is required to suppress viral replication and protect the immune system and a similarly high level (> 80%) of adherence has also been suggested in order to benefit from prescribed exercise programmes. However, in clinical practice, adherence to both these regimens often falls below the desirable level. This project aims to investigate a wide range of psychological and personality factors that may lead to adherence/non-adherence to medical treatment and exercise programmes.

Methods: HIV positive patients who are referred to the physiotherapy unit of Guy's exercise programme as part of the standard care are continuously recruited. Data on social cognitive variables (attitude, intention, subjective norm, self-efficacy, and outcome beliefs) about the goal and specific behaviours, selected personality factors, perceived quality of life, physical activity, self-reported medication adherence and physical assessments are collected at baseline, at the end of the exercise programme and again 3 months later. The project has positive objective measures of both exercise (attendance log and compliance to physical measures such as improved fitness level, weight loss, improved circumferential and skinfold measures) and medication adherence (verified by non-invasive hair analysis).

Discussion: The novelty of this project comes from two key aspects, complemented with objective information on exercise and medication adherence. The project assesses beliefs about both the underlying goal such as following prescribed treatment, and about the specific behaviours, underlining the necessity of taking the medication, using both implicit and explicit assessments of patients' beliefs and attitudes. We predict that if the way people think about the underlying goal of their treatment, explicit medication and exercise behaviours can modulate the effects of the behaviour-specific thinking and if the relationship between adherence to exercise and to medical treatment is stronger among those with more favourable views about the goal. Results from this study should identify the key contributing factors to inform subsequent adherence research and afford a more theoretical assessment matrix. The project also aims to inform patient care practices.

UK Clinical Research Network registration number: UKCRN 7903.

Keywords: HIV, Adherence, Health-related exercise, Social cognition, Implicit association test, Hair analysis

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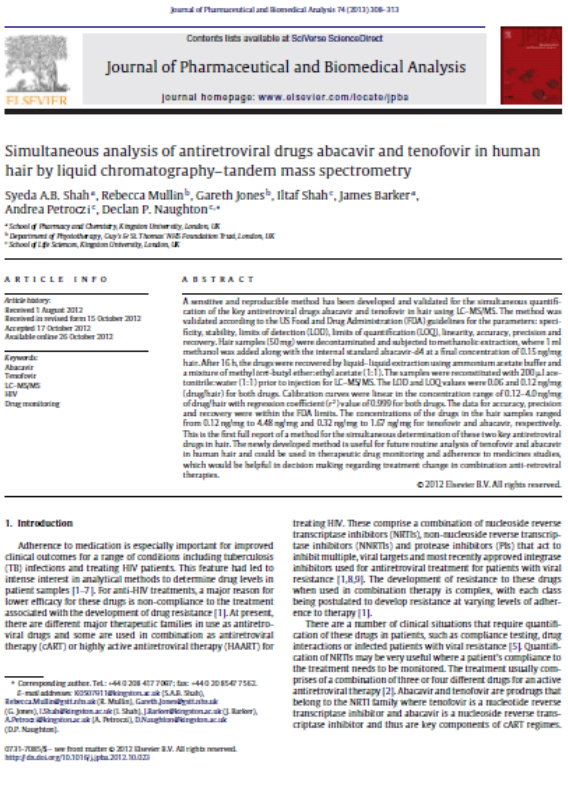

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Simultaneous analysis of antiretroviral drugs abacavir and tenofovir in human hair by liquid chromatography–tandem mass spectrometry

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ABSTRACT

A sensitive and reproducible method has been developed and validated for the simultaneous quantification of the key antiretroviral drugs abacavir and tenofovir in hair using LC–MS/MS. The method was validated according to the US Food and Drug Administration (FDA) guidelines for the parameters: specificity, stability, limits of detection (LOD), limits of quantification (LOQ), linearity, accuracy, precision and recovery. Hair samples (50 mg) were decontaminated and subjected to methanolic extraction, where 1 ml methanol was added along with the internal standard abacavir-d4 at a final concentration of 0.15 ng/mg hair. After 16 h, the drugs were recovered by liquid–liquid extraction using ammonium acetate buffer and a mixture of methyl *tert*-butyl ether:ethyl acetate (1:1). The samples were reconstituted with 200 μl acetonitrile:water (1:1) prior to injection for LC–MS/MS. The LOD and LOQ values were 0.06 and 0.12 ng/mg (drug/hair) for both drugs. Calibration curves were linear in the concentration range of 0.12–4.0 ng/mg of drug/hair with regression coefficient (r^2) value of 0.999 for both drugs. The data for accuracy, precision and recovery were within the FDA limits. The concentrations of the drugs in the hair samples ranged from 0.12 ng/mg to 4.48 ng/mg and 0.32 ng/mg to 1.67 ng/mg for tenofovir and abacavir, respectively. This is the first full report of a method for the simultaneous determination of these two key antiretroviral drugs in hair. The newly developed method is useful for future routine analysis of tenofovir and abacavir in human hair and could be used in therapeutic drug monitoring and adherence to medicines studies, which would be helpful in decision making regarding treatment change in combination anti-retroviral therapies.

1. Introduction

Adherence to medication is especially important for improved clinical outcomes for a range of conditions including tuberculosis (TB) infections and treating HIV patients. This feature had led to intense interest in analytical methods to determine drug levels in patient samples [1–7]. For anti-HIV treatments, a major reason for lower efficacy for these drugs is non-compliance to the treatment associated with the development of drug resistance [1]. At present, there are different major therapeutic families in use as antiretroviral drugs and some are used in combination as antiretroviral therapy (cART) or highly active antiretroviral therapy (HAART) for treating HIV. These comprise a combination of nucleoside reverse transcriptase inhibitors (NRTIs), non-nucleoside reverse transcriptase inhibitors (NNRTIs) and protease inhibitors (PIs) that act to inhibit multiple, viral targets and most recently approved integrase inhibitors used for antiretroviral treatment for patients with viral resistance [1,8,9]. The development of resistance to these drugs when used in combination therapy is complex, with each class being postulated to develop resistance at varying levels of adherence to therapy [1].

There are a number of clinical situations that require quantification of these drugs in patients, such as compliance testing, drug interactions or infected patients with viral resistance [5]. Quantification of NRTIs may be very useful where a patient's compliance to the treatment needs to be monitored. The treatment usually comprises of a combination of three or four different drugs for an active antiretroviral therapy [2]. Abacavir and tenofovir are prodrugs that belong to the NRTI family where tenofovir is a nucleotide reverse transcriptase inhibitor and abacavir is a nucleoside reverse transcriptase inhibitor and thus are key components of cART regimes.

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