Stress and Fatigue and their Association with Adherence to HIV Antiretroviral Therapy

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Purpose

This preliminary study is designed to test relationships of stress, HRV, fatigue, and medication adherence.

Background

- Adherence to HIV antiretroviral medications is a critical determinant of treatment success or failure.
- ART nonadherence is suboptimal and range between 27%-80% (depending on population and measure).
- Assessment methods: Subjective (patient self-reporting) or objective (pill count, drug concentration and metabolites, pharmacy refill data or (MEMS) caps.
- Several factors may impede adherence: psychosocial, demographic, disease, patient-provider relationship.
- Stress and fatigue are less studied and have inconsistency in published literature.
- Fatigue is commonly-reported symptoms by individuals with HIV infection (33-88%).
- Individuals with fatigue were significantly less likely to adhere to ART (few studies).
- HRV reflects the ability of the heart to adapt to various internal and external physiological and environmental stimuli within a specific timeframe (stress, fatigue).

Methods

Setting: Infectious Disease Clinic in Denver CO

Participants: N = 55 PLWH with daily surveys (medication adherence, fatigue and stress) and sensor (FitBit Alta™ wristband)
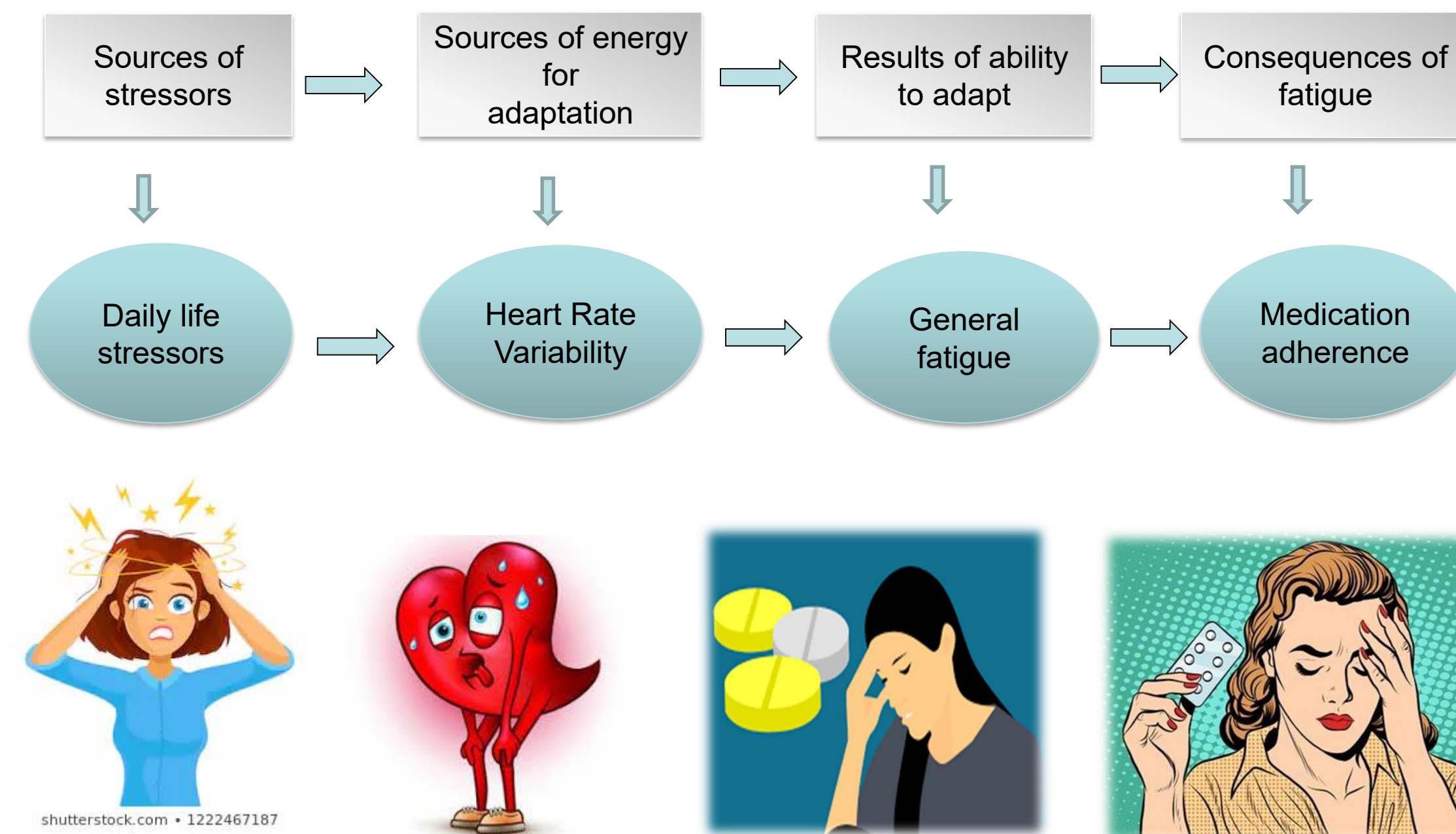
Procedure:

- Participants were sent daily surveys at random times for 30 days
- Participants used a Fitbit monitor for the same 30 days

Data analysis:

- Descriptive data, Generalized Linear Mixed Models, & chi-square test scores

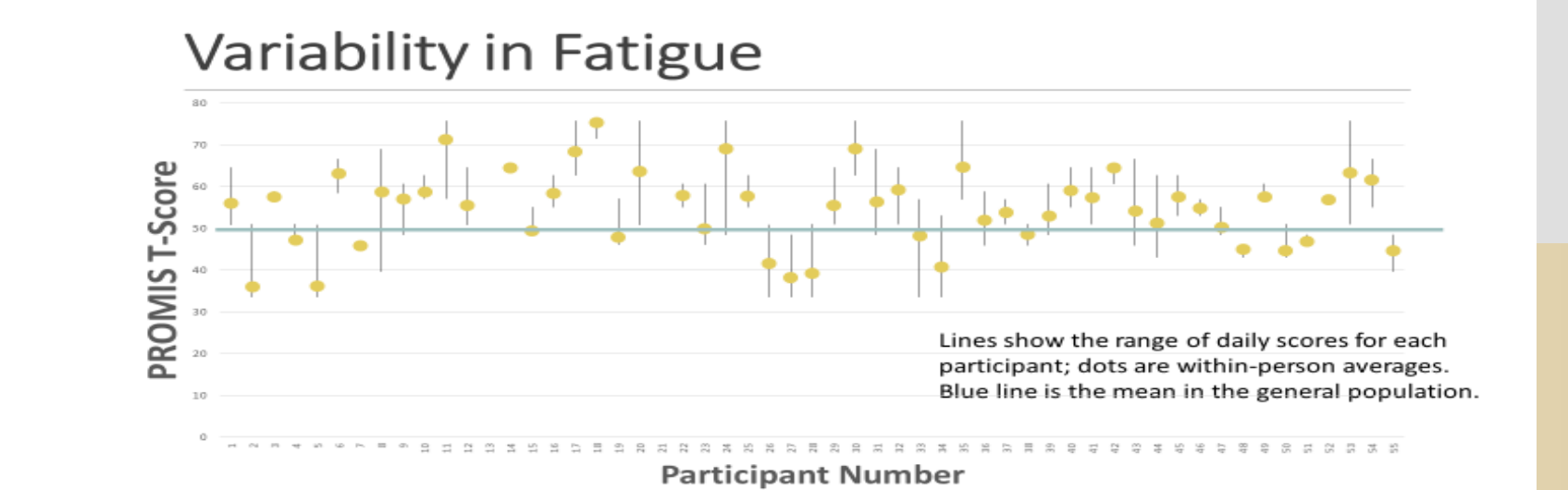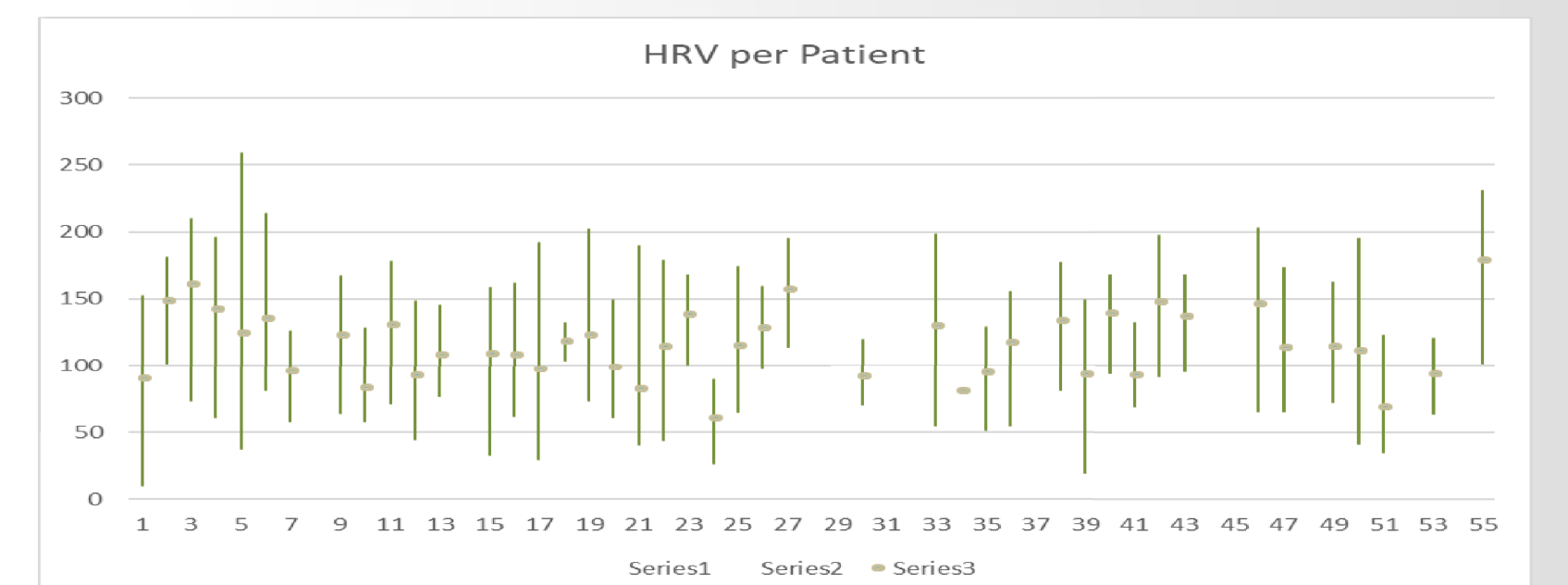## Theoretical Framework

Results

Important results:

- High stress on 23% of days, at least once for 56% of persons with HIV
- Sensors showed stress: HRV < 75 on 15% of days / 53% of participants
- Heart rate variability M=117 mms/beat
- Factors predicting fatigue:
  HRV significant p<0.001
  Stress significant p<0.001 but not self-reported adherence

Daily Variables -> Next day Adherence

HR and Activity	$p < .05$?	Surveys	$p < .05$?
Steps		Perceived control	*
Active minutes		Mood	*
Resting HR		Stress	
Maximum HR		Coping	
Average HR		Social support	*
Minimum HR	*	Experienced stigma	*
Heart rate variability	*	PROMS Fatigue	
		Motivation for ART	*
		Barriers to self-care	*

Discussion

- HRV is a predictor to ART adherence
- Fatigue is common among persons with HIV
- Fatigue symptoms varied both between persons and over time.
- HRV is important biomarker of fatigue and stress
- Results consistent with the theoretical model

HRV per Patient

Variability in Fatigue

Lines show the range of daily scores for each participant; dots are within-person averages. Blue line is the mean in the general population.

Conclusions

- Despite scientific and clinical efforts, adherence to ART remains suboptimal
- Adherence should be assessed regularly and should be individualized
- Future studies can focus on qualitative aspects of nonadherence
- Larger sample and multi-location studies are needed

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