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Exercise testing and intervention: Translation into a low resource community

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Background

- Rainbow nation
 - Non-communicable disease escalation
 - Variable resources in communities
 - Exercise physiology, aka Biokinetics
 - Development of a public health system
- Simple tools for health measurement
 - SF-8
 - Step-test
 - Actiheart

Method

- Ikageng, Kenneth Kaunda district
 - Representativeness: age, sex, income, education, occupation, BMI, BP, disease profile.
- Study 1: Setswana SF-8.
 - Face validity, test-retest reliability, internal consistency.
- Study 2: 8 minute Step-test protocol.
 - Metronome or music?
 - Individually or with friends?
- Study 3: Preferred physical activity
- Study 4: Short exercise trial in the community.
 - Actiheart, waist circumference, adherence, reasons for drop out.

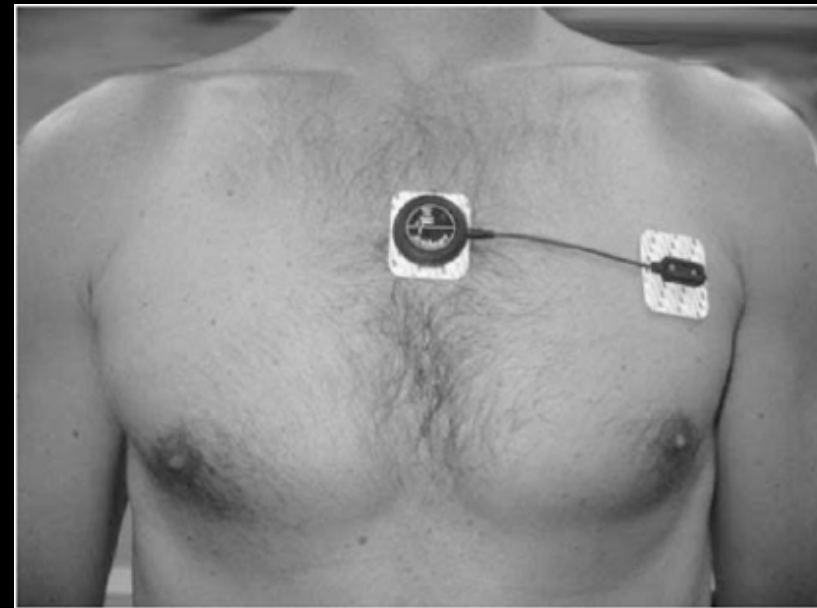
Results: Study 1

- 60 participants (M=26, F=34)
- SF-8 translation and back-translation showed preservation of meaning.
- Use in the community demonstrated face validity.
- Internal consistency: Cronbach's alpha 0.87.
- Test-retest reliability over 4-week washout
 - Spearman's rho: moderately correlated
 - Wilcoxon sign-rank test: not significantly different

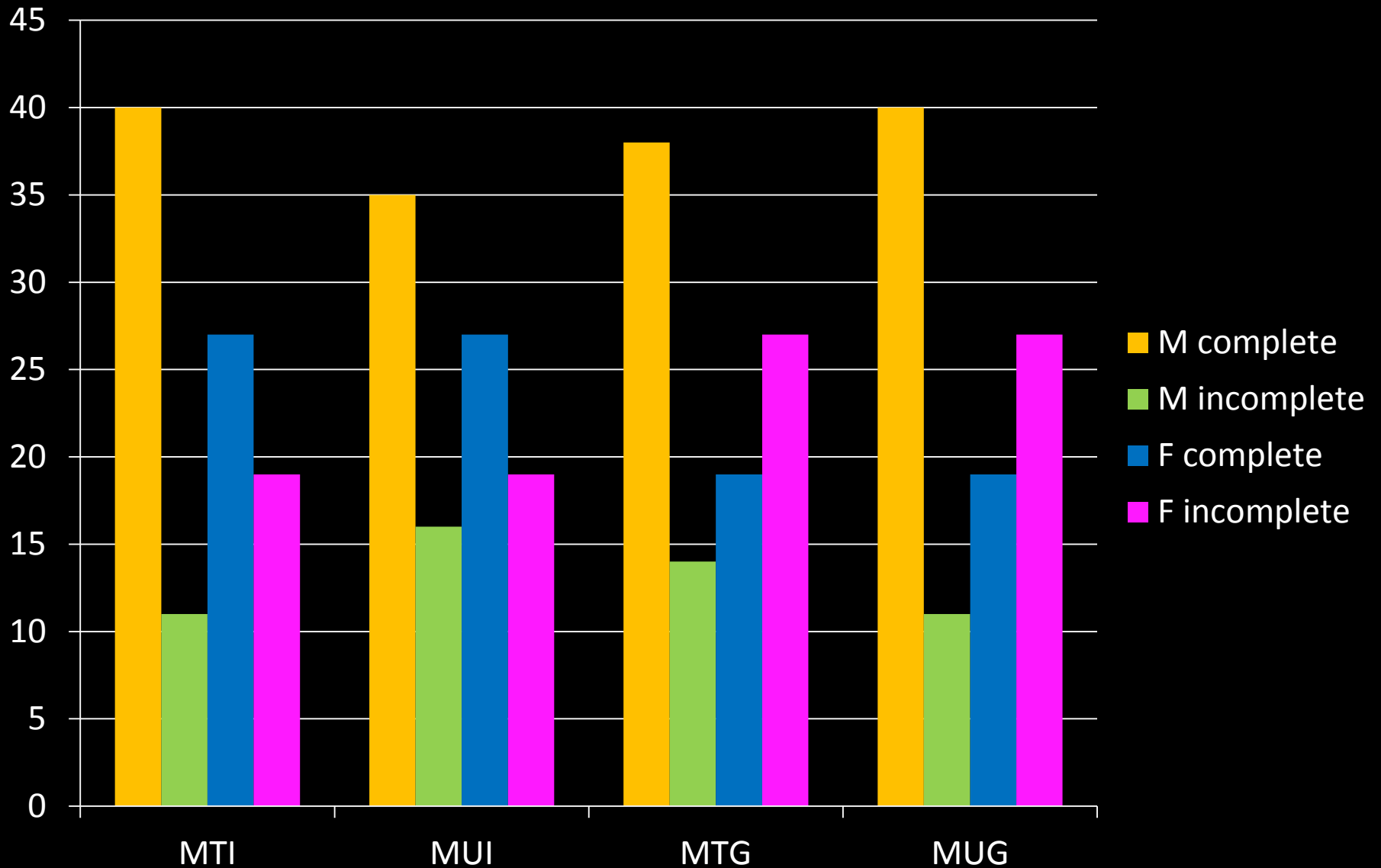
	Translated Setswana Version		SA Standard English Version	
	Wilcoxon sign-rank (p)	Spearman's rho	Wilcoxon sign-rank (p)	Spearman's rho
Q1-General health	0.55	0.42	0.74	0.51
Q2-Physical functioning	0.69	0.41	0.53	0.42
Q3-Role-physical	0.40	0.43	0.58	0.50
Q4-Bodily pain	0.86	0.43	0.67	0.44
Q5-Vitality	0.50	0.38	0.87	0.52
Q6-Social functioning	0.21	0.56	0.10	0.53
Q7-Role-emotional	0.12	0.50	0.71	0.51
Q8-Mental health	0.50	0.60	0.88	0.61
PCS	0.83	0.45	0.48	0.63
MCS	0.52	0.50	0.10	0.61

Results: Study 2

- 52 participants (M=27, F=25)
- Standardised protocol for step test
 - 5 min seated baseline, 8 minute test, 15 cycles (60 beats)/min to 33 cycles (132 beats)/min, 2 min seated recovery.
 - Predict VO_2 peak from Actiheart data



Completers of Tests



Results: Study 3

- 150 participants:
 - 20 pilot draft questionnaire,
 - 130 complete final questionnaire.
- Preferred Physical Activity (PPA-Q)
 - English and Tswana
 - Six items, self-administered or completed by a research on behalf of illiterate participants
 - Current PA, and perceived exertion during PA, as well as PA preferences
 - Internal consistency: Cronbach's alpha 0.86

- Participants in main study
 - 100% black, 50 men, 80 women.
 - Mean age 46 years (SD 9 years)
 - 38% unemployed
 - 38% employed full time
 - 57% earned R1000-5000 per month
 - Compare with SA mean R27,600 and median R20,000
 - Typical wages for cleaning, housekeeping, pet care
 - 25% < R1000 pm, 19% > R5000 pm.
 - 72% live in “brick” homes, 28% informal dwellings
- Walking. Dancing. Soccer.
- Mornings!



Results: Study 4

- 76 participants (26 male, 50 female)
- 4 week intervention, pre-post design
 - Combined aerobic and resistance training
 - 70% heart rate reserve (Actiheart)
 - SF-8 (South African Setswana version)
 - Exercise benefits and barriers scale (EBBS; English)
 - Mother-tongue interviews with completers (9) and non-completers (6)
- 54 completers (15 male, 39 female)

		Men					Women		
	N	Baseline	End	P-value	N	Baseline	End	P-value	
Age (years)	15	39.6±4.59			39	42.6±7.44			
Height (m)	15	1.73±0.10	1.73±0.10	0.41 ^a	39	1.58±0.06	1.58±0.06	0.12 ^a	
Body Mass (kg)	15	80.9±23.9	79.9±23.8	0.02 ^{b*}	39	80.4±19.0	79.5±19.4	0.00 ^{a*}	
BMI (kg/m ²)	15	26.2±7.06	26.3±7.10	0.41 ^a	39	31.6±7.82	31.9±8.05	0.003 ^{a*}	
WHR	15	0.87±0.07	0.86±0.67	0.17 ^a	39	0.79±0.07	0.78±0.08	0.15 ^a	
SBP (mmHg)	15	129.6±15.8	126.8±12.2	0.25 ^a	39	126.7±13.1	123.5±15.2	0.05 ^a	
DBP (mmHg)	15	85.4±17.5	82.8±14.9	0.23 ^b	39	83.4±9.88	83.9±9.83	0.73 ^a	
RHR (bpm)	15	74.6±10.6	75.2±14.4	0.83 ^a	39	77.5±10.0	77.7±11.7	0.89 ^a	
FBG (mmol.L)	15	4.88±0.79	5.21±1.85	0.53 ^a	39	5.20±1.84	4.75±1.85	0.04 ^{b*}	
FTC (mmol.L)	15	4.70±0.81	4.69±0.93	0.77 ^b	39	4.57±0.52	4.84±0.86	0.07 ^b	
PVO2max (ml.kg ⁻¹ .min ⁻¹)	15	33.5±5.11	32.2±5.62	0.19 ^a	39	25.9±3.72	28.0±3.64	0.003 ^{a*}	
RPE	15	3.53±0.91	3.06±0.96	0.03 ^{a*}	39	3.94±0.85	3.43±0.82	0.00 ^{b*}	
PCS	15	54.4±6.59	55.8±3.41	0.36 ^a	39	48.1±8.96	55.7±4.38	0.00 ^{b*}	
MCS	15	48.7±9.26	55.9±4.19	0.003 ^{b*}	39	50.9±8.81	55.1±4.95	0.00 ^{b*}	

Benefits

- Health improvement
- Knowledge of health status
- Fitness
- Combat disease
- Lose Weight
- Reduce tiredness
- Reduce disease
- Reduce stress
- Age gracefully

Barriers

- Lack of time
- Lack of interest
- Illness / disease
- Job
- Unreadiness