

Examining the Use of Wearable Technology in Rural Older Adults with Type 2 Diabetes

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Introduction

- Increasing physical activity is effective in improving quality of life, number of healthy days, and glycemic control in older adults with type 2 diabetes (T2D)⁵
- Wearable, activity-tracking devices may be helpful for individuals with T2D to self-monitor their physical activity goals
- Fitbits are highly acceptable among older adults with T2D²
- Use of Fitbits leads to improved knowledge and health behaviors, quality of life, and diabetes management²
- The purpose was to assess the acceptability and use of wearable physical activity trackers in rural community dwelling older adults with T2D
- The Health Information Technology Acceptance model (HITAM) provides a framework for wearable physical activity tracker acceptance (Figure 1)³

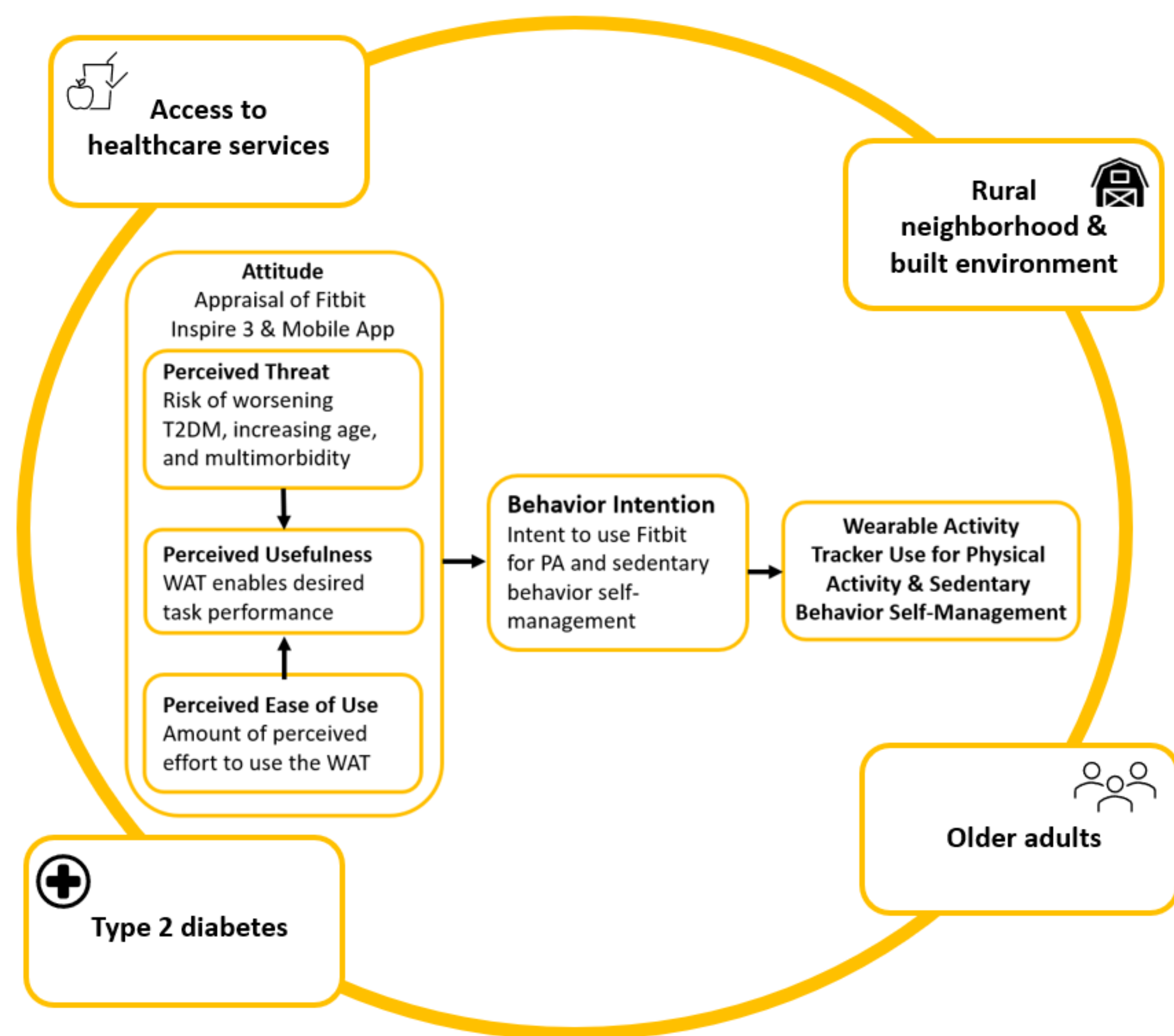


Figure 1. Application of the Health Information Technology Acceptance Model for wearable activity tracker use in rural older adults with T2D³

Methods



Figure 2. Fitbit Inspire 3¹

- Prospective, descriptive design
- Eight Midwestern community dwelling older adults
- Inclusion criteria: 1) T2D diagnosis, 2) 55+ years of age, 3) rural community dwelling, 4) owns smartphone & willing to download Fitbit app, 5) willing to wear Fitbit for 14 days, 6) able to read, write, & interact with Fitbit and mobile app
- Exclusion criteria: 1) self reported physical activity restriction, 2) cognitive impairment
- Recruited from rural health clinics, senior centers, and email

Study Procedures:

- Participants wore Fitbit for 14 days
- Baseline surveys: Demographic & health characteristics, Environmental Supports for Physical Activity, Community Healthy Activities Model Program for Seniors, Mobile Device Proficiency Questionnaire
- Follow-up Survey: 10-Item Technology Survey

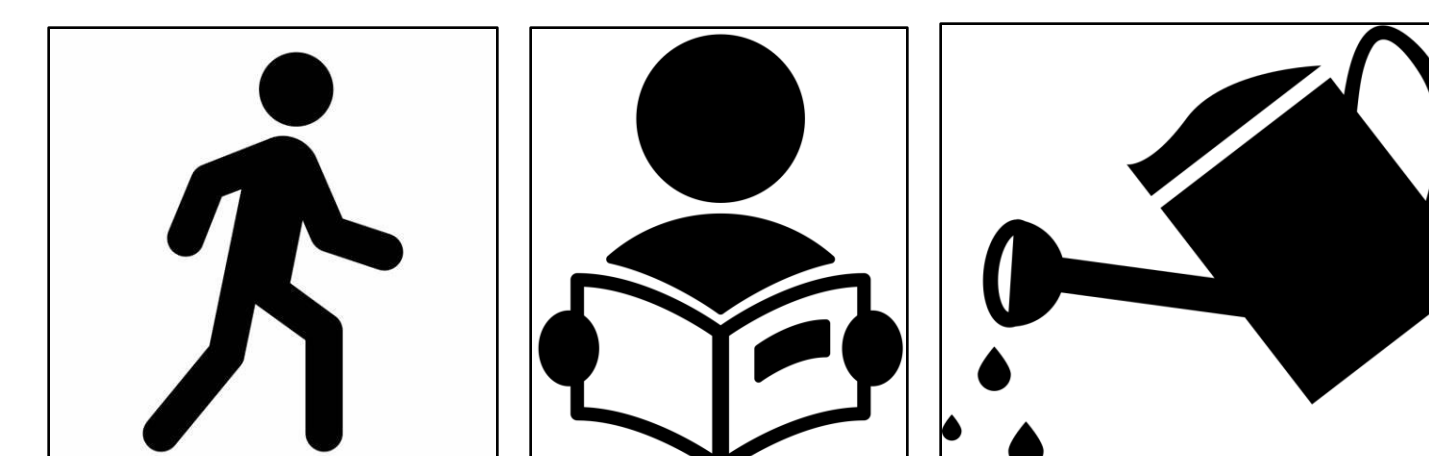
Survey	Variable	Benchmarking
10-Item Technology Survey	Usability	Strongly agree and Agree ranking (average score ≥ 4) = Usable Strongly disagree, Disagree, and Somewhat agree ranking (average score ≤ 3.9) = Not usable
	Acceptance	Strongly agree and Agree ranking (average score ≥ 4) = Acceptance Strongly disagree, Disagree, and Somewhat agree ranking (average score ≤ 3.9) = No Acceptance

Table 1. Benchmarking Usability & Acceptance Criteria^{4,6}

Results

Participants had high proficiency using mobile smartphones (M=57.6, SD=8.4)

- Most participants (75%) felt that their neighborhood was a safe place to walk
- 63% of participants thought community-based physical activity programs were important and 88% found their community public recreation facilities safe
- All participants reported taking leisurely walks twice per week and 38% reported walking briskly 4 times per week
- Participants take part in a variety of activities over the course of a week including reading, arts & crafts, gardening, and church activities



	n	%	Mean	SD
Age			64	5
Gender				
Female	4	100		
Race				
White	7	87.5		
American Indian or Alaska Native	1	12.5		
Ethnicity				
Not Hispanic/Latino	7	87.5		
Hispanic/Latino	1	12.5		
Education				
High school diploma or GED	1	12.5		
Some college credit, no degree	3	37.5		
Associate degree	1	12.5		
Bachelor's degree	1	12.5		
Master's degree	2	25		
Employment				
Employed	4	50		
Unemployed	0	0		
Retired	3	37.5		
Disability	1	12.5		
Current living situation				
I live with someone else	8	100		
Years living with T2DM			16.1	8.4
T2DM Medications				
No medications	0	0		
Injectable insulin	5	62.5		
Injectable blood sugar lower medication, other than insulin	5	62.5		
Oral blood sugar lowering medication	5	62.5		
Other health problems				
Yes	4	50		
Family or friend with T2DM				
Yes	7	87.5		
Previous Fitbit Activity Tracking Watch Use				
Yes	4	50		
Previous Activity Tracking Watch Use (other brands)				
Yes	2	25		

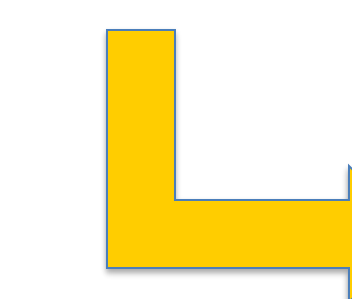
Table 2. Participant Characteristics (n=8)

Results

	Mean	SD
Overall	40.5	1.7
Ease of Use	20	1.4
Usefulness	16.3	2.4
Acceptance	4.2	1.6

Table 3. 10-Item Technology Questionnaire (n=6); results indicate a high level of usability with Fitbit Inspire 3

Preliminary data depicts the Fitbit as both usable and acceptable among rural older adults with T2D



	Average Score	Benchmarked Criteria Outcome
Usability	4	Usable
Ease of Use	4.1	Usable
Acceptance	4.2	Acceptance

Table 4. Benchmarking Usability & Acceptance

Discussion

- Older adults proficient in technology found the Fitbit Inspire 3 to be useable and acceptable
- Participants enjoyed using the Fitbit Inspire 3 and reported they were interested in continuing to use the device for activity monitoring
- Participants found wearing the Fitbit Inspire 3 to be motivational
- The Fitbit Inspire 3 is a relatively low-cost physical activity tracking device that has the potential to improve health outcomes in rural older adults living with T2D
- Future research will examine the Fitbit Inspire 3 as a tool for physical activity self-monitoring in a multi-modal lifestyle intervention tailored specifically to the rural built environment

Acknowledgement

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