Acceptability Of Fitbit For Physical Activity Tracking Within Clinical Care Among Men With Prostate Cancer

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Abstract

Prior research has not examined the acceptability of commercially available fitness tracking devices in men with prostate cancer, many of whom are at risk for conditions that physical activity could alleviate. We conducted an exploratory 3-week field study to examine acceptability of the Fitbit Zip and attitudes towards integrating fitness tracking into clinical care among men with prostate cancer. Twenty-six men used the Fitbit Zip for a one-week baseline phase followed by a 2-week optional use phase and then completed in-depth interviews. Interview data was analyzed using inductive thematic analysis. Participants found the device comfortable and easy to wear. Barriers to use included health and technology difficulties. Participants expressed value in sharing Fitbit data with their health care team. Findings support the use of easy to use and simple fitness trackers among men with prostate cancer and there could be opportunities to integrate fitness tracker data into clinical care.

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Abstract

Prior research has not examined the acceptability of commercially available fitness tracking devices in men with prostate cancer, many of whom are at risk for conditions that physical activity could alleviate. We conducted an exploratory 3-week field study to examine acceptability of the Fitbit Zip and attitudes towards integrating fitness tracking into clinical care among men with prostate cancer. Twenty-six men used the Fitbit Zip for a one-week baseline phase followed by a 2-week optional use phase and then completed in-depth interviews. Interview data was analyzed using inductive thematic analysis. Participants found the device comfortable and easy to wear. Barriers to use included health and technology difficulties. Participants expressed value in sharing Fitbit data with their health care team. Findings support the use of easy to use and simple fitness trackers among men with prostate cancer and there could be opportunities to integrate fitness tracker data into clinical care.

Introduction

Men with prostate cancer, particularly those taking androgen deprivation therapy (ADT), are at high risk for side effects of treatments such as loss of muscle mass and strength, increased fat mass and cholesterol, glucose intolerance, and decreased bone mineral density[1,2] The negative impacts of these side effects can be mitigated by regular light or moderate-to-vigorous physical activity. There is evidence suggesting that men with prostate cancer who are provided with supervised and/or home-based aerobic and resistance exercise programs have improvements in quality of life, fitness, body composition, lower body strength, and fatigue[3,4] Exercise has also been associated with reduced risk of recurrence and mortality in men with prostate cancer[5,6] In spite of these benefits, men with prostate cancer have objectively lower physical activity than the general population of men over age 60[7].

Patients with chronic disease have reported benefits from tracking health indicators such as weight, physical activity, and diet.[8] Commercially available wearable activity trackers such as the Fitbit® are promising tools that could be used as a mechanism to encourage daily physical activity among populations that are highly inactive and could be employed to improve healthy

aging in the general population[9,10] They also have the potential to be used by health care providers as a way to monitor patient prognosis and recovery through tracking activity levels and mobility[11]. In a qualitative study, health care providers who were asked questions about the use of self-monitoring tools among older adults reported that data taken from wellness monitoring tools could be used as an education, tracking, and problem solving tool as well as an indicator on how to prioritize care[12]. The same study interviewed community dwelling older adults and found positive reactions to the idea of sharing information from wellness trackers with their doctors. Both health care providers and older adults believed that sharing wellness information would increase patient-doctor communication; however, researchers found that older adults in the study were not likely to adopt self-monitoring tools for every-day use due to low perceived personal usefulness and control over data privacy[12]. Even when this technology is found acceptable, patients' and providers' expectations for use of the data in healthcare do not necessarily align[13].

Wearable activity trackers can track step count, distance walked, and calories burned. They also have the capability of setting goals, posting to social media sites, creating networks with friends and family, and displaying visual presentations of data if the user syncs their device with a smartphone or computer. For these devices to be effective in motivating health behavior change, they need to be affordable, accurate, and comfortable to wear. The data collected needs to be displayed in a way that is easy to access and interpret by the user[14]. If these needs are not met, despite good intention, these devices may pose substantial barriers to adoption and use among older adults who, on average, are not as comfortable with technological devices as younger adults[15].

Studies that have assessed wearable activity tracker usability in older adult populations and in populations with chronic conditions have yielded mixed results. In a study of older adults with chronic disease, researchers found that participants thought wearable fitness trackers were comfortable and increased awareness of their physical activity, but lack of instructions and limited outside assistance on how to use the tracker were barriers to adoption[15]. Another study assessing the usability and validity of the Fitbit among patients with chronic obstructive pulmonary disease (COPD) found that participants gave the Fitbit high usability scores and reported that the device was pleasant and easy to wear[16]. In a small study of older adults who wore three different wearable activity trackers, participants were initially excited about wearing activity trackers, but 5 out of 8 participants stated that they would not continue using the devices because they felt the devices were uncomfortable, inaccurate or a waste of time. Surprisingly, none of the participants stated technological issues as a reason for discontinuation of use[17]. All of these studies concluded that wearable activity trackers could be useful for self-management of chronic disease, but leave open many questions about their acceptability and use in healthcare integration.

Given the enormous potential for wearable fitness trackers to improve the physical health and well-being of patients with chronic diseases, it is important to further characterize and address any barriers to use and assess the feasibility of adoption of these technologies among older populations. We conducted an exploratory investigation using a 3- week field study with qualitative feedback to capture acceptability of using wearable activity trackers and attitudes towards integrating the use of these devices into clinical care among men with prostate cancer.

Methods

We undertook the Physical Activity and Sedentary Time (PAST) project to better understand device-measured physical activity and sedentary time patterns in men with prostate cancer including those with a history of ADT use. One piece of the project we report on here is a 3-week field study using mixed methods to better understand prostate cancer patients' acceptability of fitness tracking and its potential to be used within health care. We divided the field study in two phases: an initial one-week baseline phase with required use of one commercially available fitness tracker (Fitbit Zip) followed by a 2-week phase of optional use. We conducted qualitative in-depth interviews at the end of the 3-week study.

Study Population and Recruitment

Men with prostate cancer (N=31) were recruited from a medium sized health care system in Washington State from October 2014 to May 2015. Human subjects approval was obtained from the Group Health Research Institute. Potentially eligible participants were identified using electronic health record data. Men with Surveillance, Epidemiology, and End Results (SEER) codes indicating prostate cancer without distant or metastasized disease were included (summary stages 0-5). We excluded men with encounter codes for palliative care, or diagnosis codes indicating a serious mental health disorder or substance use disorder. Letters were mailed to eligible men inviting them to phone a study staff member if they were interested in participating. On the phone, a study staff member completed oral informed consent and asked additional screening questions. Exclusion criteria were not having prostate cancer, unable to stand, unable to walk one block, and not speaking and reading English.

Procedures

Participants attended in in person visit to receive a Fitbit Zip device to wear for one required baseline week and completed a brief baseline survey. The baseline week allowed us to characterize participants' on step count levels to ensure there was a diverse range of physical activity levels. During the visit we helped participants set up and sync the device to their Fitbit account. Participants were also provided with written instructions on how to wear and sync the Fitbit device. After the baseline phase, participants were given the Fitbit to keep and use for two optional use weeks, along with instructions for how to use and sync the device to a personal computer or smartphone. At the end of this 2-week phase, we conducted an in-depth exit interview by phone. Using an app we built to access data from Fitbit server through Fitbit's Web Application Programming Interface (API), we downloaded participants' Fitbit data for analysis of steps. Participants kept their Fitbit and were paid $10 for completing the study.

Data collection and analysis

Collected data included the baseline survey, Fitbit steps, and interviews. The baseline survey collected participant demographics, health characteristics and level of technology use and ownership from items used in the National Health and Aging Trends Survey[18]. We analyzed surveys with descriptive statistics to characterize participants and compare participant groups by those who had received ADT and those who had not.

To describe physical activity levels, average daily step counts were computed for each participant during the baseline phase and for those who used the Fitbit in the optional use phase. We noted whether or not participants had synced their Fitbit on their own during the optional use phase using the API (indicated by having step count data on at least one day during the optional use phase and coded as yes/no). We also asked the participant whether they used their Fitbit (yes/no) in the optional use phase during the exit interview. We classified prior use of a wearable physical activity tracker (e.g. pedometer, Fitbit, Jawbone) before participating in the PAST study (yes/no) from answers to the baseline survey or during the exit interview.

Qualitative data was collected through semi-structured in-depth interviews to capture attitudes on acceptability of the Fitbit for personal use and interest in sharing Fitbit data with health care providers through the electronic health record. Interview questions were open ended with follow-up prompts. Example questions included:

- What did you think of the Fitbit? What did you like about wearing the Fitbit? What didn't you like about wearing the Fitbit?
- How have you used your Fitbit during the past 2 weeks? What would have helped you use the Fitbit more?
- Would you want a healthcare team member to see your Fitbit data? If so, who?
- Would you be open to having your Fitbit data go into your electronic medical record? What concerns would you have about this?

The interviews were audio-recorded and transcribed. A coding team of 4 members reviewed transcripts, developed codes and definitions (i.e., codebook), and refined the codebook in an iterative process using inductive thematic analysis[19]. Transcripts were coded using Atlas.ti software to assist with summarizing quotes for each code and identifying themes.

Results

Participants

Out of 205 people contacted for participation, 31 (15%) completed the in-person visit. One participant dropped out of the study, and two participants were unable to complete exit-

interviews. Two participants did not wear their Fitbit Zip properly during the baseline phase and were not included in the analysis. Of the 26 participants who completed the study, 14 (54%) had ADT treatment. Men with a history of taking ADT were older, were more likely to be retired, had lower body mass index (BMI) and had a lower daily step count (over 2000 fewer steps on average) than men without a history of ADT use (Table 1). Men in both groups had many chronic conditions and were relatively similar in their use of technology and ownership of various types of devices. Only about half of the men used email and texting regularly, but all owned a cell phone. Only six participants reported owning fitness trackers and these were primarily men with no history of ADT treatment.

Table 1.

Participant characteristics and mean Fitbit steps by history of ADT treatment

	Total n = 26†	**History of ADT n = 14†**	**No ADT treatment n = 12†**
Demographic characteristics n, (%) unless otherwise specified			
Age, years, mean (SD)	70.5 (9.7)	74.4 (7.9)	65.8 (9.9)
Retired	18 (69.2)	13 (92.9)	5 (41.7)
Married	19 (73.1)	12 (85.7)	7 (58.3)
Some college or less	5 (19.2)	4 (28.6)	1 (8.3)
Non-Hispanic white	21 (80.8)	12 (85.7)	9 (75.0)
Health characteristics			
BMI, kg/m^2, mean (SD)	28.3 (4.6)	27.0 (3.2)	29.6 (5.6)
High blood pressure	13 (50.0)	6 (42.9)	7 (58.3)
High cholesterol	11 (42.3)	5 (35.7)	6 (50.0)
Arthritis	8 (30.8)	5 (35.7)	3 (25.0)
Depression	4 (15.4)	2 (14.3)	2 (16.7)
Years since diagnosis	5.4 (6.7)	9.1 (7.7)	1.3 (0.7)
Technology use & ownership			
Computer in the home	25 (96.2)	13 (92.9)	12 (100)
Online in past month	25 (92.6)	13 (92.9)	12 (100)
Emailed in past month	25 (96.2)	13 (92.9)	12 (100)
Emailed most days in past month	14 (53.9)	6 (42.9)	8 (66.7)
Texted most days in past month	8 (30.8)	3 (21.4)	5 (41.7)
Accessed internet on mobile device in last month	18 (69.2)	9 (64.3)	9 (75.0)
Own a tablet	13 (50.0)	7 (50.0)	6 (50.0)
Own a laptop	17 (65.4)	8 (57.1)	9 (75.0)
Own a smart phone	12 (46.2)	5 (35.7)	7 (58.3)

	Total n = 26[†]	**History of ADT n = 14**[†]	**No ADT treatment n = 12**[†]
Own a cell phone	14 (53.9)	11 (78.6)	3 (25.0)
Own a fitness tracker	6 (23.1)	1 (7.1)	5 (41.7)
Fitbit steps per /day, mean (SD)	6,239 (2,564)	5,139 (2,114)	7,521 (2,517)

ADT = androgen deprivation therapy

[†]Numbers may not add up to totals due to missing values

Physical A ctivity

Table 2 shows participants' Fitbit use by group. During the baseline week, participants wore the Fitbit for a minimum of 5 days. Daily steps ranged from 2041 to 11205. Fourteen participants (54%) reported using the Fitbit during the optional use two-week phase. Of these, six (43%) had received ADT and seven (50%) had never used a pedometer or wearable activity tracker before participating in this study. The data in Table 2 indicate that many men taking ADT, and several with very low step counts (< 4,000 steps/day) were able and willing to use a new technology for fitness tracking during the optional use phase. Of the 8 men without a history of using ADT who used the Fitbit during the optional use phase, all but two men had prior experience using a fitness tracker and baseline phase step counts were a mixture of relatively low (~5,000 steps/day) to high (~10,000 steps/day).

Table 2.

Fitbit steps and use by treatment group

ADT treatment (n=14)					**No ADT treatment (n=12)**				
ID	Baseline steps	Used Fitbit[a]	Synced Fitbit[b]	Prior use of tracker[c]	ID	Baseline steps	Used Fitbit[a]	Synced Fitbit[b]	Prior use of tracker[c]
1	7100	No	No	No	**15**	6361	No	No	**Yes**
2	7916	No	No	No	**16**	5108	**Yes**	No	No
3	3370	No	No	No	**17**	5002	**Yes**	**Yes**	**Yes**
4	4495	No	No	**Yes**	**18**	6648	No	No	No
5	8696	**Yes**	**Yes**	No	**19**	10138	No	Tried[*]	No
6	3645	**Yes**	No	No	**20**	4063	**Yes**	No	**Yes**
7	4553	No	No	No	**21**	9081	**Yes**	No	**Yes**
8	2041	**Yes**	No	No	**22**	7324	**Yes**	No	**Yes**
9	5897	No	No	No	**23**	11013	**Yes**	No	**Yes**
10	6092	**Yes**	No	**Yes**	**24**	5149	**Yes**	**Yes**	**Yes**

ADT treatment (n=14)				**No ADT treatment (n=12)**			
11 7841	No	**Yes**	**Yes**	**25** 9167	No	**Yes**	No
12 2832	No	No	**Yes**	**26** 11205	**Yes**	**Yes**	No
13 3988	**Yes**	No	No				
14 3491	**Yes**	No	No				
Total Count:	**6**	**2**	**4**	**Total Count:**	**8**	**4**	**7**

[*]Could not sync device due to technical difficulties so did not use the Fitbit
[a]Reported using the Fitbit during the 2-week period of optional use during the interview
[b]Based on accessing the Fitbit API to determine whether or not they synced their Fitbit during the optional use phase
[c]Reported prior use (before enrolling in the study) of a fitness tracking device on the survey or during the interview

Attitudes Toward Use

Themes that emerged from exit interviews regarding attitudes towards Fitbit use include wearability, ease of using technology, value in use, barriers to use, helpful features, and integration with healthcare. Next we describe each theme and provide illustrative quotes.

Wearability

Most participants (93%) found the Fitbit Zip easy to wear and comfortable. Participants noted that the device was easy to put on and said they forgot that they had it on and that wearing the device did not inconvenience them in any way:

Once I put it on in the morning I was totally unaware of its presence on my body or in my pocket.**P17**

Very few problems wearing the Fitbit were reported. A few participants expressed that they sometimes forgot to put on the device in the morning or to reattach the Fitbit when they changed clothes:

Sometimes I forgot to take it off, because I was sick and I wasn't moving around that much. Sometimes I forgot to put it on. I wore it when I remembered.**P14**

One participant reported the device fell out of its case and another did not like that they had to remove the Fitbit when they used their hot tub.

Ease of using technology

Six participants successfully used a smartphone or computer to sync their Fitbit during the optional use phase, although the syncing process was challenging for some of these participants. A few men reported needing help from a family member to successfully sync their devices:

*My wife is whiz kid on the computer and so she would call me in at the end of each day just before we went to bed and say, "Okay, stand here so the computer can read what's on your Fitbit… sometimes I had to stand a little — there a few minutes before the information was transferred from my Fitbit to the computer, but then it all lit up in color and it was, not a bar graph, but whatever you call that, a graph. And that was very interesting. It was easy to read, easy to understand.***P17**

However, four participants found it easy to sync their devices and considered the process user friendly and presented data they found interesting, for example one participant reported:

*Every day or two I sync it. I download it to Fitbit application for my iPhone and so every day or two I sync it. And then I just sort of look at the information there … It's very easy. The Fitbit application is very — I think the term is user friendly.***P5**

The remaining three participants had difficulty syncing their Fitbits by themselves:

*I guess that's one of the things about this particular FitBit that was somewhat more difficult because I had to go online to the FitBit webpage to find out why I couldn't get it to sync; it did not sync in the beginning. So I had to do a number of things to make it work.***P24**

For some participants, the frustration led to giving up on using the device:

Largely, I'm not wearing it because it doesn't interact with my computer very easily…why bother? I just go use my manual step counter. **P11**

Participants who did not sync their Fitbit said they did not try because they were either too busy or did not care about connecting to their account because they could use the display on the device without using their computer or smartphone. In other cases, participants attempted to sync their device but encountered technical difficulties they could not overcome. Indeed, difficulties using technology were a common reason participants gave for not using the Fitbit during the optional use phase.

Value in using

Participants were divided in their opinions on the usefulness of the Fitbit for increasing their activity levels. For some, the Fitbit improved their awareness of their own physical activity level and motivated them to increase it by setting daily step count goals or helped them maintain their activity level:

*I think I like to make sure I'm doing some minimal amount of activity. And it's kind offun to see what you've been doing, how many steps you've done, how many miles you've gone.***P23**

*Well, I think it was fascinating to find out how many steps I had done for one thing or another and it was helpful on the walk that my wife and I try to take but fail to take every day.***P10**

Being able to check their step count throughout the day made them more conscious of how active they had been and enabled them to identify opportunities to increase activity to meet their goal. In other cases, participants reported the device would not be useful because they felt they were active enough and did not need to change their activity levels with or without the Fitbit.

Well, I'm not sure that I need to wear it, because I'm pretty active, like I go golfing, and I go walking, as much as possible, and I go up and down stairs all day long, so I don 't feel like I — I do sit for a long periods of time, also, but I lift weights, and I'm pretty active. **P2**

Because I'm very active usually and I'm up going and running here and there so I don't think I need to keep track of it. **P3**

Participants also liked having the ability to track their own data. Family members were also cited as contributing to the usefulness and motivation aspects of the Fitbit if they had similar devices and could serve as challengers in activity competitions. Participants also felt the Fitbit motivated them by providing a reward:

*So I think it builds in a positive feedback loop that it can provide, and that little instrument, the FitBit, is a really powerful way of doing that, so I think it — I have mostly all positive things to say. I don't think there's any negative, maybe you just have to remember to log in on some point, sync your FitBit to your computer; that's about the only thing that you have to do.***P24**

People like to get… rewards, and by being able to look at it easily online and on my phone. I know both my wife and I have sometimes been at 10:00 p.m. occasionally dressed for bed and see that we only need, oh, 600 more steps to get to that 10,000 and go put your coat on and walk around the block. **P22**

Many participants endorsed value in continuing to use the Fitbit and expected they would continue to use the device indefinitely.

Barriers to Fitbit use

Conversely, some participants reported that the Fitbit was not helpful because they felt unable to alter their level of physical activity due to physical health challenges like pain and injuries. Fatigue and poor stamina limited participants' ability to walk for long periods or to engage in other activities.

My situation is if I did not have pain, I would be active enough that I wouldn't need the Fitbit because I would know I'm getting — I'm not very sedentary — well, I'm retired, so I guess I am sedentary. But when I don't have pain and I'm not limited by the energy that I have from my treatment, I'm quite active. **P1**

Another barrier included several participants' concern that the step count is inaccurate or did not capture important activities of daily living in which other forms of physical activity are used (e.g., muscle-strengthening, stretching):

So I'll give you a case. I filled my laundry, and it's logged I walked 2,000 steps. I did not walk 2,000 steps. **P20**

*I guess the only surprise was that it seemed to register less activity than I felt I actually did because it was only measuring steps, and I was doing more than steps. I was lifting. I was bending. I was twisting. I was doing all that other sort of stuff.***P11**

Priority Fitbit features

Step count and distance walked were the two features used most by participants. Some participants used social features with family members. Very few participants reported using other Fitbit features (e.g., calories, active minutes, challenges):

I'd only use it [Fitbit] for a pedometer. I mean that's all. I don't give a [darn] about the calories and all that stuff." **P4**

I think I like to make sure I'm doing some minimal amount of activity. And it's kind offun to see what you've been doing, how many steps you've done, how many miles you've gone. **P23**

Two participants who had continued to wear the Fitbit during the optional use phase and had also previously owned Fitbits reported using the social features:

I like it. I mean, it gives me weekly updates. Every now and then we'll challenge our daughters because the whole family has one now. We bought them for them, too. So we'll do a challenge every now and then, and I'll try to kick butt. **P21**

*I've got some family members that are "Fitbit friends," so we kinda see each week how many steps everybody walked.***P20**

Attitudes toward integrating Fitbit with care

When asked about whether they were open to having their Fitbit data go into their electronic health record, participants felt comfortable sharing their Fitbit data for this purpose though some endorsed the need for limitations:

Yeah. I think it keeps people honest in that case. But at the same time, I don't wanna start getting ads for granola bars every day in my inbox. **P18**

That would be fine with me. I think if it would help a physician or someone understands how you're doing, there would be no problem with that. **P23**

Other participants describe additional information that would be needed to contextualize data shared with providers:

That's a good question because, I think I most generally would. I think there might need to be some notes along with it, like I said, if there was a decrease in activity it might be because of

illness, or something like that. So I think it tells part of a story, but not all of a story. If you did that, you would need to have…something like, a mechanism usually about the person's physical ability to walk or whatever. **P24**

Many felt it would be helpful information for their provider to have to ensure their health is supported and that interventions are provided at appropriate times:

Again, somebody I had a relationship with, no matter who it was as long as it was where you had already established something and could be looking at that and either saying, "Well, that was just great. It was just 10,011 steps yesterday. "Or, "I saw you were only doing 1,000 steps. Are you feeling okay? Is there something getting in the way of your walking? "That kind of stuff. **P10**

*Clearly, the primary care physician, the one that's supposed to be your first point of contact, and so the ongoing collaborator in your wellbeing would be essential. And then depending on each person's situation, and the teams wrapped around, and whatever team would seem appropriate to be looking at that data that would help them design a better intervention or better and better treatment that all makes sense to me.***P18**

Other participants were not sure how it would be helpful to their health care team and worried it might burden physicians, in particular:

The thing for me would be, this would be all right for them, but if it's just one little piece of information going into my record, I don't see it making much difference one way or the other. And it's the kind of thing that I don 't, and I may be wrong, I don't see doctors or even nurses spending a whole lot of time looking at my Fitbit data. **P19**

Many participants suggested that someone other than the physician such as a physical therapist or personal trainer should be the person to go over their data with them for feedback.

Discussion

Findings from our 3-week exploratory field study suggest that some men with prostate cancer find wearable fitness trackers like Fitbits highly acceptable—participants generally found the device comfortable and easy to wear, averaging over 6,000 steps per day when used. When given the choice, over half of participants continued using the Fitbit during the optional use two-week phase. While participants found step count and social features most useful, they experienced several barriers to use, including health-related limitations, problems syncing devices, and data inaccuracies and omissions. Despite these issues, many participants expressed value in sharing Fitbit data with their health care team. These insights expand on prior work by further characterizing feasibility of wearable fitness tracker adoption among an older population, men with prostate cancer.

Our qualitative themes align well within existing technology acceptance frameworks (e.g. the Technology Acceptance Model) and prior work[12,15,16,20]. The TAM emphasizes the importance

of perceived usefulness and perceived ease of use in shaping actual system use. We demonstrated actual use by having men use a Fitbit during a baseline week and two optional use weeks. While men were very willing to wear the device for the required baseline week, only half of the men used the Fitbit during the optional use phase that followed. Men with a history of ADT treatment were less likely to use the device than men without an ADT treatment history during the optional use phase. One factor that likely contributed to this disparity is the difference in average age between these two groups: the average age of ADT users in this sample was 10 years higher than those who had not received ADT. Also, men with a history of ADT use had less prior experience using fitness trackers. However, it is promising that many ADT users with very low step counts and who did not have prior experience using such fitness tracking technologies continued using their Fitbit during the optional use phase.

Regarding perceived ease of use, participants generally found the Fitbit to be easy to use and comfortable. However, many experienced technological barriers when trying to sync their Fitbit, which discouraged them from using the device. Some gave up trying to use their Fitbit while others sought help from family members that were more experienced with using technology. We selected the Fitbit Zip because it does not require smart phone ownership (which was low in our sample; 56%) and participants could sync it to a computer (96% owned a computer) or view the step count and distance walked for the current day on the device display. Therefore, simple tracking devices appear preferred by the older men in this study.

One design recommendation that could help improve ease of use includes continuing to offer fitness trackers that have a display that do not require syncing. Furthermore, having a medical team member request that patients use a fitness tracker and work with them over time to understand the data and learn to use more technologically advanced features of devices (e.g. syncing) could help promote a positive feedback loop that many participants were excited about. Giving patients clear and simple instructions for using wearable tracker devices, syncing them, and using their features could also facilitate adoption. This recommendation dovetails well with prior work indicating that health care providers could work together with older adults to help them understand their wellness monitoring data[12].

Regarding perceived usefulness, many participants endorsed value in using the Fitbit to ensure they engaged in a “minimal amount of activity” (P23) and to motivate them to squeeze in more steps. Barriers to usefulness included health limitations and feeling very active already. The latter is somewhat concerning considering that the average step count was well below recommendations for older adults or those with chronic conditions (8,000 steps/day)[21]. Particularly among men with a history of ADT use, step counts were very low (~5,000 steps/day). This further underscores the importance of helping men with prostate cancer receive feedback and education on their level of physical activity and its importance in supporting them as they age. Many men were quite active to start with, although wearable trackers like Fitbit could help these men continue to stay active as levels of physical activity decline with age.

All of the men were willing to wear the Fitbit if asked by someone from their health care system. This suggests that if used in clinical practice to get a sense of habitual activity, a health care provider might be able to discuss the importance of being even more active or continue to remain active. Indeed, all men reported willingness to share their Fitbit data with their health care

provider and few had concerns about the information becoming part of the electronic health record. This willingness could, in part, be due to their involvement in a study that took place within their own health care system. There were some limitations on willingness to share the data including not wanting to be bombarded with messages about their health and being able to amend the data in order to explain or contextualize it.

Much prior work that has examined physical activity trackers in older adults has been limited to perspectives on use[12] or required use over a week or less.[15,16] Our 3-week field study enabled us to capture their use for longer. When offered the opportunity, many participants opted to continue using the Fitbit during the optional two-week phase but faced several technical barriers. While this method offered further insights into adoption, our small sample of men with prostate cancer and other chronic conditions could limit the generalizability of findings to other groups or devices. Additional support for using and syncing Fitbit devices could have impacted participants" overall experience or improved optional use. There is merit in future work to further characterize and address the physical activity tracking needs of older adults and connection with healthcare providers. In particular, studies are needed to examine longer-term use of devices in larger and more diverse samples of older adults. Our findings suggest such devices should be designed to be simple for older adults to use, incorporate social features, and capture additional physical activities beyond walking, such as muscle strengthening and stretching. More targeted and easy to technology could improve adoption by older adults. Future work is also needed to explore how to integrate physical activity data into clinical care, including information and workflow needs of health care providers, in ways that minimize burden and promote utility. It may not be feasible to fully review and contextualize a detailed data stream within short provider visits. Future work should examine the right places for this data to enter into clinical workflow and the right health care team members to receive, review, and provide patient feedback on the data.

Conclusion

Our exploratory field study found that there are many opportunities to link fitness tracking to clinical care and to help the broader population of men with prostate cancer, and possibly other chronic health conditions, become more active and prevent further health declines. Our findings are congruent with those of Huh[12] as well as Mercer's[15] work in people with various chronic conditions and Vooijs[16] work with COPD. This accumulation of evidence suggests that small-scale feasibility studies integrating fitness trackers with clinical care for high risk populations (e.g. COPD, prostate cancer) are warranted. These future interventions will need to make the technology as straightforward as possible, most likely through in-person demonstration sessions in conjunction with simple written materials and interactions with the health care team.

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