# Perceptions, motivators and barriers to the acceptance of wearable trackers in people with Huntington's disease

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## Background

- Environmental factors such as lifestyle behaviours have emerged as potential moderators of Huntington's disease (HD) onset and progression[1,2]. Wearable activity trackers (WATs) offer an exciting opportunity to further investigate the role of lifestyle in disease modification but are reliant on end user acceptance and long-term adoption.

- Aim: To explore views across the HD community on using WATs to monitor lifestyle behaviour.

## Methods

- Recruitment took place at the 2019 Annual European HD Association meeting (Bucharest, Romania) and 3 regional UK meetings, where individuals with HD and family members/carers were invited to take part in the following:

**User Acceptance Questionnaire**
- Adapted from Wu et al[3].
- Available in English, German, Polish and Spanish.
- Consisted of 2 demographic items and 35 items across 8 domains:
- The average response for each domain was recorded as positive (score >2.5), negative (score <1.5) or neutral (score 1.5-2.5) opinion.
- Kruskal-Wallis and Wilcoxon Rank-sum tests were used to explore differences due to (1) Age and (2) whether they had HD or were a family member/carer.

**Focus Group Discussions**
- Conducted in English in groups of 4-6.
- 3 focussing exercises were employed:

  1. An adapted semi-structured topic guide exploring attitudes towards wearable devices[4].
  2. A vignette-scenario around using wearable technologies.
  3. A 10 item ranking task (relating to comfort, appearance, accuracy, ease of use, battery life, cost, the location of the tracker on the body, data security and smartwatch functionality).

- Conversations were audio recorded, transcribed and thematically analysed.

## Questionnaire Results

- 105 completed questionnaires were analysed (47 HD; 58 family members/carers).
- All sections of the questionnaire produced median scores greater than 2.5, representing a tendency for positive opinions towards WATs (being advantageous, easy and enjoyable to use, compatible with lifestyle, able to understand the information from a WAT and having a willingness to wear (Table 1).
- HD participants reported a more positive attitude to WATs than family members/carers (Test Statistic = 3.073, adjusted p value = 0.017).

Table 1. The percentage of median positive, neutral, and negative responses along with the total number of responders for each questionnaire section. Key: IQR = Interquartile range.

| Questionnaire Section Domain | Positive Responses (%) | Neutral Responses (%) | Negative Responses (%) | Cohort Response (Median [IQR]) | Total Number of Responders (n) |
|---|---|---|---|---|---|
| Relative Advantage | 94.17 | 1.94 | 3.88 | 3.6 [3.0 – 4.0] | 103 |
| Ease of Use | 89.32 | 4.85 | 5.83 | 3.4 [2.8 – 4.0] | 103 |
| Compatibility | 78.43 | 8.82 | 12.75 | 3.3 [2.3 – 4.0] | 102 |
| Results Demonstrability | 86.27 | 7.84 | 5.88 | 3.0 [2.8 – 4.0] | 102 |
| Enjoyment | 66.67 | 12.12 | 21.21 | 3.0 [2.0 – 4.0] | 99 |
| Social Influence | 66.67 | 16.67 | 16.67 | 2.6 [2.0 – 4.0] | 102 |
| Attitude | 85.15 | 2.97 | 11.88 | 3.2 [2.5 – 4.0] | 101 |
| Behavioral Intention | 89.32 | 4.85 | 5.83 | 3.7 [3.0 – 4.0] | 103 |

## Focus Group Results

- 15 participants took part in three focus groups.
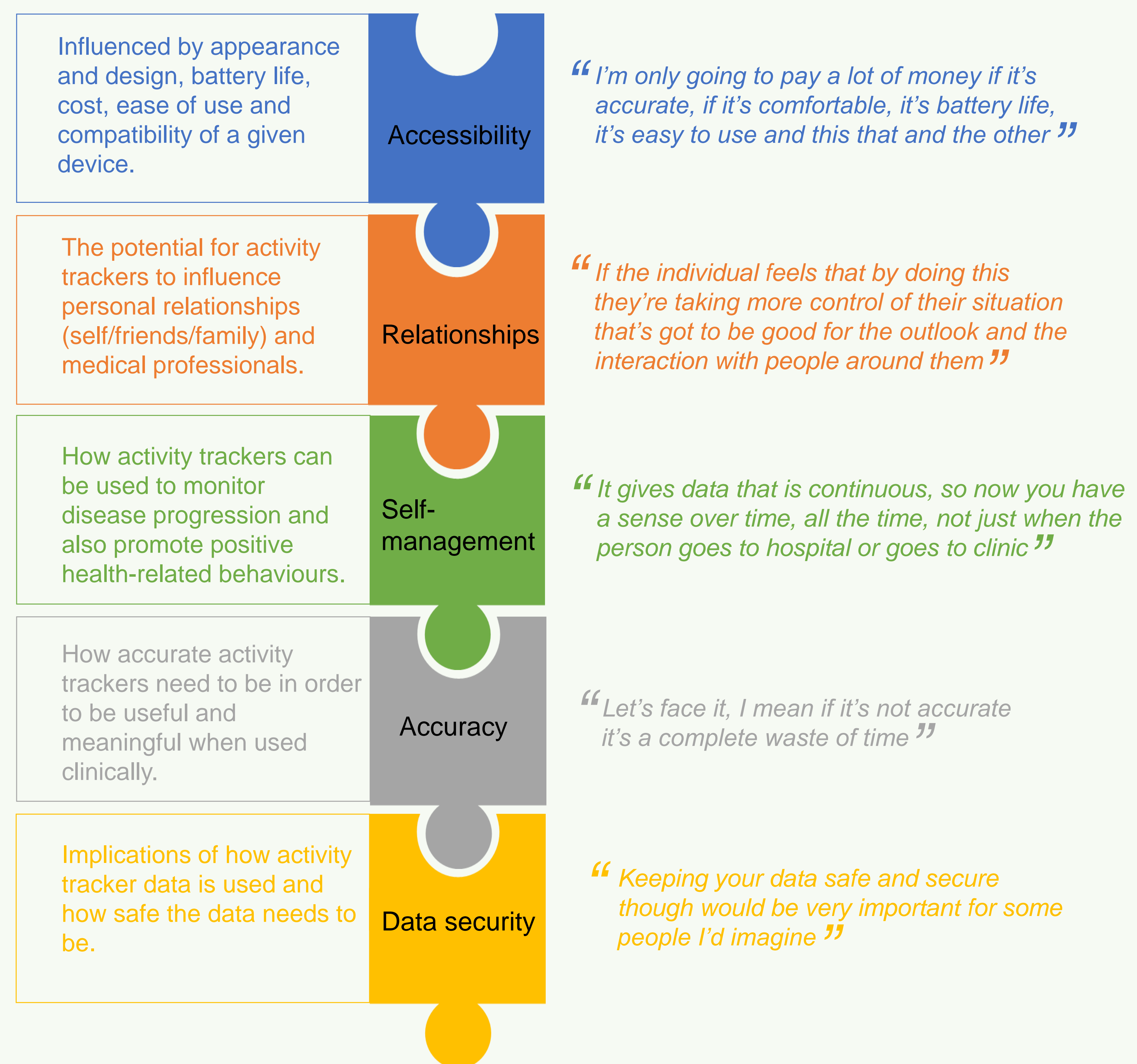- 5 key emerging themes were identified (Figure 1).



**Accessibility** — Influenced by appearance and design, battery life, cost, ease of use and compatibility of a given device.
*" I'm only going to pay a lot of money if it's accurate, if it's comfortable, it's battery life, it's easy to use and this that and the other "*

**Relationships** — The potential for activity trackers to influence personal relationships (self/friends/family) and medical professionals.
*" If the individual feels that by doing this they're taking more control of their situation that's got to be good for the outlook and the interaction with people around them "*

**Self-management** — How activity trackers can be used to monitor disease progression and also promote positive health-related behaviours.
*" It gives data that is continuous, so now you have a sense over time, all the time, not just when the person goes to hospital or goes to clinic "*

**Accuracy** — How accurate activity trackers need to be in order to be useful and meaningful when used clinically.
*" Let's face it, I mean if it's not accurate it's a complete waste of time "*

**Data security** — Implications of how activity tracker data is used and how safe the data needs to be.
*" Keeping your data safe and secure though would be very important for some people I'd imagine "*

Figure 1. Key emerging themes and illustrative quotes from focus group participants.

## Discussion / Conclusion

- Whilst WATs were broadly recognised as acceptable for both monitoring and management, aspects of device design/functionality must be considered to promote acceptance in this clinical cohort. These include, how accessible and compatible the device is to people with HD, how it could influence relationships and how it can be used for self-management. The accuracy and security of data from a given device must also be considered.

**References: [1]** Mo et al. (2015). Neurosci Biobehav Rev. 52:178-92. doi:10.1016/j.neubiorev.2015.03.003. **[2]** Fritz et al. (2017). J Huntingtons Dis. 6(3):217-235. doi:10.3233/JHD-170260. **[3]** Wu et al. (2016). Comput Human Behav. 64:383-392. doi:10.1016/j.chb.2016.07.005. **[4]** Papi et al. (2016). BMJ Open. 6:e009544. doi:10.1136/bmjopen-2015-009544.