

Acceptability and feasibility of digital assessment of falls risk, frailty and mobility impairment using wearable sensors in PLWH as part of HIV care

P278

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Background

- The European AIDS Clinical Society guidelines recommend screening for frailty and falls in people living with HIV over the age of 50 to enable early identification and appropriate intervention.^{1,2}
- Digital assessment tools (DAT) such as the extensively validated QTUG™ device³ that utilises wearable sensors and questionnaires to conduct a functional analysis of mobility, generating a number of standardised mobility impairment, frailty estimate (FE), and falls risk estimate (FRE) scores, offer significant potential for enhancing frailty and falls risk identification and monitoring in both clinical and community settings for the care of people living with HIV. (Figure 1)
- This study aimed to assess the acceptability and feasibility of incorporating this DAT into routine HIV outpatient care.**

Figure 1. The QTUG™ Device



Methods

- This was a cross-sectional study using mixed methods
- People living with HIV ≥60 attending routine outpatient care from two HIV clinics in Southern England between December 2022 and July 2023 were invited to participate
- For all study participants:
 - Baseline demographic and clinical data were collected
 - A FRAIL Scale score was obtained (this was already standard-of-care at one clinic, participant at the other clinic underwent this additional assessment)
 - Mobility parameter assessment using the DAT was undertaken
- Any individuals newly identified as frail or at increased risk of falls risk were offered appropriate onward referral for intervention, depending on findings and locally available services
- A subset of participants were invited to participate in semi-structured in-depth interviews to explore their attitudes to the DAT's acceptability, as well as screening for frailty and falls in general, how to manage the results and language used
- Healthcare professional involved in the use of the DAT and in the care of older adults living with HIV were invited to participate in a focus group to explore their attitudes towards the feasibility of using the DAT in routine HIV care, and their thoughts on frailty/falls screening and management
- Interviews and focus groups were transcribed and analysed using thematic analysis in NVIVO

Table 1. Participant Characteristics, Falls Risk and Frailty Scores

| | | Total |
|--|--------------------|---------------|
| | | 50 (100%) |
| Demographic Factors | | |
| Age | | 64.5 [62, 68] |
| Gender (self-identified) | Male | 32 (64%) |
| | Female | 17 (34%) |
| | Non-binary | 1 (2%) |
| Country of Birth† | United Kingdom | 26 (52%) |
| | Africa | 18 (36%) |
| | Europe | 2 (4%) |
| | Other | 3 (6%) |
| | Sexual Orientation | Gay/Lesbian |
| | Heterosexual | 25 (50%) |
| | Other | 2 (4%) |
| HIV-Associated Factors | | |
| Time since HIV diagnosis | | 21 [16,31] |
| Time on ART | | 17.5 [13,24] |
| VL <50 c/mL | | 47 (94%) |
| Frailty-Associated Factors | | |
| >5 comorbidities | | 12 (24%) |
| Polypharmacy (≥5 concurrent medications) | | 19 (38%) |
| >1 falls in the past 12 months | | 15 (31%) |
| Frailty and Falls Risk Scores | | |
| FRAIL Scale Score | Robust | 23 (46%) |
| | Pre-Frail | 15 (30%) |
| | Frail | 12 (24%) |
| DAT Falls Risk Estimate* | Low Risk | 30 (67%) |
| | Medium Risk | 6 (13%) |
| | High Risk | 9 (20%) |
| DAT Frailty Estimate* | Non-Frail | 23 (51%) |
| | Transitional | 11 (24%) |
| | Frail | 11 (24%) |

Categorical variables are shown as N (%), continuous variables as median [IQR]

*It was not possible to obtain FRE and FE scores on 5 participants due to technical challenges

†Country of birth was missing for one participant

Results

- A total of 50 participants were recruited across both sites
- Baseline demographic and clinical data, as well as FRAIL Scale scores were obtained from all participants, with DAT output obtained from 45 participants
- These results are presented in **Table 1**
- 7 individuals took part in in-depth interviews and the themes identified included
 - DAT:** acceptable, thorough, quick, occasional technical challenges
 - Frailty/Falls screening:** appropriate/relevant; age vs other cut off for invitation, language use
 - Results management:** at HIV clinic, advice on how to interpret results
- 4 healthcare professionals of different roles took part in the focus group and the themes identified included:
 - Screening and result pathways:** best to identify pre-frail/intermediate risk, clear intervention/referral pathways essential
 - DAT:** engaging and interesting for patients, motivational, time-consuming, technical challenges
 - FRAIL Scale:** quick, easy, requires some health literacy

"I loved the fact that you were using technology in a really positive way"

"more informative than just doing the pure questionnaire"

"would certainly like [in intervention] linked in with the [HIV service], that to me is an absolute"

"When you've got the more time, people are already identified as you know, being relevant for that to all you know, devoting that time to it seems better"

"we're not quite as good at using our clinical judgment to identify pre-frailty. So I think that's where it's been quite useful"

Discussion:

- Using the DAT to screen for falls and frailty as part of routine HIV care is highly acceptable to older people living with HIV attending for routine outpatient care. However, there are perceived barriers to feasibility amongst healthcare professionals, due to competing clinical commitments, technical issues and unclear referral pathways, particularly for those identified as pre-frail or at intermediate risk of falls.
- A high number of individuals aged 60 or over had increased risk of falls and pre-frail or frail, despite the sample's relatively young age. This reinforces the concept that incorporating frailty and mobility impairment screening into routine HIV care.

Key Points:

- Acceptability of digital assessment for frailty and falls risk among older people living with HIV is high
- There are perceived barriers to feasibility for its implementation as a screening tool amongst healthcare professionals
- A high number of individuals aged 60 or over were identified as being at increased risk of falls and pre-frail or frail
- The DAT may provide a useful adjunct to the assessment and monitoring of those known to be frail or at increased risk of falls
- There is a need for a clear pathway for interventions for pre-frail/moderate falls risk group

PRESENTED AT THE HIV GLASGOW CONFERENCE | 10-13 NOVEMBER 2024

We thank the British HIV Association for funding this study, and we thank all study participants and staff at participating centres

References:

- European AIDS Clinical Society Guidelines (2023): EACS Guidelines Version 12.0 [available from <https://www.eacsocty.org/media/guidelines-12.0.pdf>]
- Van Kan G, Rolland YM, Morley JE et al (2008). Frailty: Towards a Clinical Definition. *JAMA* 9(2):71-72. <https://doi.org/10.1016/j.jamda.2007.11.005>
- Greene, B.R., McManus, et al. Digital assessment of falls risk, frailty, and mobility impairment using wearable sensors. *npj Digit. Med.* 2, 125 (2019). <https://doi.org/10.1038/s41746-019-0204-z>