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## Abstract

Exercise referral schemes are established within community-based healthcare; however, they have been criticised for failing to evidence long-term behaviour change relative to usual care. As such, recent reviews have called for refinement of their delivery with a focus on embedded strategies targeting client motivation. This research letter presents findings from an initial pilot trial conducted within Wales' National Exercise Referral Scheme (NERS), examining the feasibility of using validated physical activity monitoring devices and an accompanying online platform within standard scheme delivery. 30 individuals referred to generic or cardiovascular pathways were offered the system; of these 17 agreed to participate. Common reasons for declining were clustered into lack of technology literacy or access, condition severity, or fear of costs associated with losing the device. Analysis of follow-up interviews after 4 weeks of use indicated that whilst participants found the monitoring devices practical and informative, only a minority ( $n = 4$ ) were using the system in full. Crucially, the system element most aligned with contemporary theories of motivation (the online portal) was not used as expected. In addition, feedback from exercise referral professionals indicated that there were demands for support from clients, which might be mitigated by more effective independent system use. Recommendations for larger scale trials using similar systems include consideration of targeted patient groups, equity of access, and providing adequate technological support that is currently beyond the capacity of the NERS system.

## KEYWORDS

Accelerometer; telehealth; motivation; exercise referral; physical activity;

## Context and Rationale:

Exercise referral schemes are established within community-based healthcare; however, they have been criticised for failing to evidence long-term behaviour change relative to usual care.<sup>1</sup> The National Exercise on Referral Scheme [NERS] in Wales has demonstrated effectiveness in providing health benefits and increased physical activity levels in the context of a pragmatic randomised controlled trial.<sup>2,3</sup> However, whilst improvements in physical activity were evident following an initial supervised period of 16 weeks, maintenance at 52 weeks was disappointing.<sup>4-6</sup> Recent reviews have hence called for refinement of the delivery of exercise referral schemes<sup>1,6</sup>, with national guidelines under consultation suggesting that research examines factors encouraging adherence and influencing long-term activity levels<sup>12</sup>.

One approach to improving compliance with exercise regimes is the use of feedback loops, for example, an accelerometer which allows users to monitor the volume and intensity of activity per day. Although there is potential for such an approach to improve activity levels within exercise schemes, the acceptability of such devices and barriers to their use are currently unknown. For example, there may be age-related differences in capacity to utilise accelerometer technology. This poses a potential implementation issue as the mean age of participants in exercise referral schemes approaches 60.<sup>6</sup>

Previous studies evaluating the use of accelerometers in exercise interventions have focused on the impact of receiving feedback regarding activity levels on maintenance of physical activity, with promising evidence emerging.<sup>7</sup> However, the potential of utilising such devices and accompanying software for more than monitoring is underexplored. For example, although motivational strategies such as goal setting and motivational interviewing are currently delivered within NERS and are widely evidenced to assist with lifestyle change,<sup>8,9</sup> concerns have been highlighted in terms of intervention fidelity and delivery consistency.<sup>6</sup>

As such, a key feature of the present pilot was the selection of technology that could potentially act as a delivery platform for high-quality motivational interventions, as well as providing monitoring feedback.

The aim of this early stage feasibility study was thus to assess the practicality of using a uni-axial accelerometer (*MyWellnessKey*: Technogym, Gambettola, IT.) and accompanying online platform (*Moveability*: Technogym, Gambettola, IT.) in the context of the Welsh National Exercise Referral Scheme. The device has been validated in a number of studies<sup>10, 11</sup> and incorporates an online portal enabling viewing of historical performance and progress tracking, and progressive and automatised goal setting via device algorithm (mastery based). The objectives were to (i) obtain service user and staff feedback on the acceptability of the device and online platform, (ii) to identify potential barriers to device uptake and use (both attitudinal and practical), and (iii) to subsequently inform recommendations for larger research trials or expanding service provision. The study was reviewed by the Research Risk Review Committee of Public Health Wales and granted human subjects approval.

#### Method:

Potential participants were screened against NERS inclusion criteria for the generic and cardiovascular programme by the scheme's Exercise Referral Professionals. At their four-week follow-up appointment, individuals who had been pre-identified in this way were invited to receive an accelerometer and take part in the study. The study recruited 26 individuals ( $M_{\text{age}} = 60.4$ ,  $SD = 11.83$ ; 9 males, 17 females) and, of these, 17 ( $M_{\text{age}} = 57.8$ ,  $SD = 12.69$ ; 7m, 10f) agreed to test a device; those who declined provided brief rationale for their decision. Four weeks post-provision, two researchers (EO, JH) made telephone contact with participants and undertook a semi-structured interview regarding the use of the accelerometers. Questions included the extent of key and platform use (e.g., frequency, difficulties, suggested improvements, reasons for lack of use), and intentions for future use

(e.g., which components, and reasons why). Of the 17 individuals who agreed to participate in the telephone interview, a total of 12 were successfully contacted at follow up.

#### Results and Recommendations:

Three common reasons emerged from a qualitative analysis of the information given for declining the offer of the device. These were: lack of technology literacy or access; condition severity (i.e., that they felt their movement was so restricted the devices would be inappropriate); or fear of costs associated with losing the device.

Analysis of follow-up interviews indicated that whilst participants found the monitoring devices practical and informative, only a minority ( $n = 4$ ) were using the system to its full potential. Participants reported a lack of awareness of the scope of the system capabilities, and uncertainty regarding its operation. Crucially, the system element most aligned with contemporary theories of motivation (the online portal) was not used in the way that it was designed, with compatibility between the devices and privately-owned computers a common problem. The majority of the sample did not have personal access to technology at a sufficient specification to successfully utilise the software. Those who were using it in full were positive regarding its perceived utility.

Feedback from the exercise referral professionals who were responsible for delivery of the NERS scheme to study participants indicated that there was a significant level of demand for additional support in the use of the accelerometers. The requirement for support by a significant proportion of participants before the system could effectively be used would need to be factored into any larger scale study.

*Recommendation 1: Schemes should identify methods of ensuring universal and equitable access to technology at the level required for full engagement with devices and online*

*platforms (e.g., through public leisure or library facilities; partnerships with private providers). This may require support from national programmes enhancing digital access, especially in rural areas.*

*Recommendation 2: Schemes should consider methods to help mitigate clients' concerns regarding the cost implication of device loss or damage to prevent reluctance to engage (e.g., subsidised insurance).*

*Recommendation 3: Future trials should consider funding and provision for ongoing technological support and troubleshooting, as well as assessing the cost-effectiveness of such support. Providing this is beyond the remit and resource capability of exercise referral scheme professionals.*

*Recommendation 4: Research examining the effectiveness of similar device packages should consider adherence to the intervention as this varied widely.*

#### Limitations and Conclusions:

We recognise the limitations of the study in terms of size and relative homogeneity of the included sample. This pilot identifies barriers that scheme providers and researchers should consider when using similar devices. It is hoped that this information could be used to inform an early stage feasibility trial of the use of accelerometers and motivational software as a method of enhancing compliance in exercise referral schemes. There is also a case for a larger scale pilot study to inform the optimum group within the NERS scheme who might benefit from the use of such technology, and whether difficulties with equity of access for different social groups and age bands can be overcome.

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**Declaration of Conflicting Interests:**

The authors have no conflicting interests to disclose.

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