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A qualitative evaluation of a physician-delivered pedometer-based step count prescription strategy with insight from participants and treating physicians

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ABSTRACT

Aims: The integration of pedometers into clinical practice has the potential to enhance physical activity levels in patients with chronic disease. Our SMARTER randomized controlled trial demonstrated that a physician-delivered step count prescription strategy has measurable effects on daily steps, glycemic control, and insulin resistance in patients with type 2 diabetes and/or hypertension. In this study, we aimed to understand perceived barriers and facilitators influencing successful uptake and sustainability of the strategy, from patient and physician perspectives.

Methods: Qualitative in-depth interviews were conducted in a purposive sample of physicians (n = 10) and participants (n = 20), including successful and less successful cases in terms of pedometer-assessed step count improvements. Themes that achieved saturation in either group through thematic analysis are presented.

Results: All participants appreciated the pedometer-based monitoring combined with step count prescriptions. Accountability to physicians and support offered by the trial coordinator influenced participant motivation. Those who increased step counts adopted strategies to integrate more steps into their routines and were able to overcome weather-related barriers by finding indoor alternative options to outdoor steps. Those who decreased step counts reported difficulty in overcoming weather-related challenges, health limitations and work constraints. Physicians indicated the strategy provided a framework for discussing physical activity and motivating patients, but emphasized the need for support from allied professionals to help deliver the strategy in busy clinical settings.

Conclusion: A physician-delivered step count prescription strategy was feasibly integrated into clinical practice and successful in engaging most patients; however, continual support is needed for maximal engagement and sustained use.

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1. Introduction

Wearable step counting devices are popular in the general population but underused in sedentary clinical populations. Integration into clinical practice has the potential to enhance physical activity levels. In prediabetes, a 2000 steps/day increase over 1 year was associated with an 8% reduction in cardiovascular event rates over 6 years [1]. Group-based programs integrating step counters lead to similar step increases in type 2 diabetes (T2DM), with even greater improvements when step goals were established [2]. However, increases are not sustained when the programs end.

We designed and conducted a physician-delivered step count prescription strategy versus usual care in patients with T2DM and/or hypertension (Step Monitoring to improve ARTERial health (SMARTER) randomized controlled trial), capitalizing on the fact that routine medical visits recur over time in chronic disease [3,4]. We provided participants with simple, low-cost pedometers to wear daily. Prescriptions with individualized daily step targets, gradually increasing over a 1-year period, were provided by the treating physician at each clinical visit. Compared to control arm participants, daily step counts increased by 1200 steps in the active arm, with improvements in glycemic control (0.38% hemoglobin A1C reduction in T2DM).

Given the benefits of the SMARTER strategy, we conducted a qualitative descriptive study to assess participants' and physicians' experiences and impressions of the intervention, in order to understand the perceived barriers and facilitators, aiming to move towards widespread implementation.

2. Methods

2.1. SMARTER trial intervention

As previously reported [3,4], SMARTER included adults with T2DM and/or hypertension, excess weight, and <10,000 steps/day as measured with 1-week pedometer data (viewing window concealed). Records of active arm participants step logbooks were reviewed with their physicians at each visit (every 3–4 months), step count goals were established, and a written step count prescription was provided. The overall aim was a net increase of 3000 steps/day over baseline by 1 year, with slower rates of increase at lower baseline levels. A SMARTER coordinator reminded physicians of upcoming visits with participants, in-person or by phone, and showed participants how to use the pedometer and record their steps.

2.2. Research design

We conducted a qualitative descriptive study [5] to explore individual experiences (active arm SMARTER participants and collaborating physicians) at a semantic level.

2.3. Participants and sampling strategies

The trial and qualitative study were approved by McGill University's Faculty of Medicine Institutional Review Board and conformed to the standards set by the Declaration of Helsinki [6]. Informed consent was obtained from all participants. In order to capture a wide range of experiences and impressions of the intervention, we conducted maximum variation sampling, a commonly used purposive sampling technique in qualitative research [7].

2.3.1. Participants

Among the active arm participants who completed the final evaluation, we sampled both 'successful' (n = 20) and 'unsuccessful' participants (n = 10) in terms of step count improvements, in a similar proportion to what we observed in the full group of active arm participants wherein 36% of participants did not increase step counts (Table 1). We also aimed to include a range of age groups and representation of both women and men.

2.3.2. Physicians

Among collaborating physicians, 62% (46/74) followed at least 1 active and 1 control arm participant. We interviewed 10 of these physicians, sampling to ensure equal sex representation, variation in years of practice, and balance between higher and lower recruiters (Table 2).

2.4. Interview methods

Using a semi-structured interview guide (Table 3), individual interviews were conducted (ABC) with participants (phone) and physicians (in-person). On average, participants were interviewed 14 (standard deviation, SD 4) months after final evaluations to assess sustainability. All interviews were audio recorded and transcribed verbatim. French interviews were translated to English.

2.5. Analysis

Thematic analysis was performed by two trained investigators (ABC and RP) [8]. Transcripts were independently coded to determine emerging themes and sub-themes. To determine code assignment, each coder compared text segments with other segments previously been assigned the same code to ensure they reflected a similar concept. Coders continually refined the existing codes, and identified new codes. Discrepancies were discussed until consensus was reached, with involvement of co-senior authors when necessary. Data coding/organization was facilitated by Dedoose v.7.0.23 (SocioCultural Research Consultants, Los Angeles, CA). Final themes and sub-themes were discussed among all investigators. We considered saturation of sub-themes separately for those who increased step counts and those who decreased, and report herein themes that were reported by over half of the participants in each group (participants who increased, participants who decreased, and physicians).

3. Results

For a final sample of 30 participants, a total of 40 participants were contacted; 7 could not be reached and 3 declined. All 10