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Acceptability and Feasibility of the Telehealth Bariatric Behavioural Intervention to Increase Physical Activity before Bariatric Surgery: A Single-Case Experimental Study (Part I)

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Declaration of Interest: AT and LB received funding from Johnson & Johnson, Medtronic and GI Windows for studies on bariatric surgery; AT has been consultant for Biotwin,

Bausch Health, Novo Nordisk and Eli Lilly; MFL has been consultant for Eli Lilly, Novo Nordisk, Rhythm and Takeda and received research funding from Merck Canada and Novo Nordisk. AT and LB are codirectors of the Research Chair in Bariatric and Metabolic Surgery at Laval University. AB, MA, PB, JL, DB, PYG, JB, PB and AJR have no conflict of interest.

Contributions: AB, Maxime St-Pierre, PB, AJR, PYG, LB, AT, PB, MFL, and JB conceptualized and designed the study. AB, PB, AJR, DB, and JB made substantial contributions to the conception and design of the intervention. AB and JB conceived and designed the intervention manual with assistance of Jenson Price. JL delivered the intervention. MA and MSP oversaw data collection. MA and AB managed the data. AB and PB conducted the statistical analysis. JB and AB performed qualitative analysis. AB, JB, and PB wrote the manuscript. All the authors critically revised the manuscript and approved the final manuscript.

Abstract

Physical activity can play an important role in optimizing metabolic and bariatric surgery (MBS) outcomes. However, patient mobilization is difficult, and development of theory-driven counseling interventions are needed. This study aimed to: 1) assess the feasibility and acceptability of the TELEhealth BARIatric behavioural intervention (TELE-BariACTIV) trial protocol/methods and intervention, which was designed to increase moderate-to-vigorous intensity physical activity (MVPA) in adults awaiting MBS; and 2) estimate the effect of the intervention on MVPA. This multicenter trial used a repeated single-case experimental design. Twelve insufficiently active adults awaiting MBS received 6 weekly 45-minute PA counselling sessions via videoconferencing. Feasibility and acceptability data (i.e., refusal, recruitment, retention, attendance, and attrition rates) were tracked and collected via online surveys, and interviews. MVPA was assessed via accelerometry pre, during and post-intervention. Among the 24 patients referred to the research team; five declined to participate (refusal rate=20.8%) and seven were ineligible or unreachable. The recruitment rate was 1.2 participants per month between 2021-09 and 2022-07. One participant withdrew during the baseline phase, and 1 after the intervention (retention rate=83.3%). No participant dropouts occurred during the intervention and 98.6% of sessions were completed. Participants anticipated and retrospective acceptability of the intervention was 3.2/4 (IQR: 0.5) and 3.0/4 (IQR: 0.2), respectively. There was a statistically significant increase in MVPA [Tau-U=0.32(0.11; 0.51)] from pre- to post-intervention. Despite a low recruitment rate, which could be explained by circumstances (COVID-19 pandemic), results support feasibility, acceptability, and preliminary efficacy of the TELE-Bari-ACTIVE intervention for increasing MVPA in patients awaiting MBS.

Keywords: Behavioural change intervention; Bariatric surgery; Physical activity; e-health; N-of-1; Motivational interviewing

Introduction

Metabolic and bariatric surgery (MBS) is the most effective long-term treatment for severe obesity (Arterburn et al., 2020). However, most adults are not meeting current physical activity (PA) recommendation before and after MBS, despite substantial weight loss and improvement in comorbid diseases, which appear to have little if any effect on moderate-to-vigorous intensity physical activity (MVPA) levels (King et al., 2015; Reis Barbosaa et al., 2019). This is problematic given that MVPA can help enhance and sustain multiple MBS benefits, including physical and mental health both before and after MBS (Bellicha et al., 2021; Boppre et al., 2022; Schurmans et al., 2022). Yet, meeting MVPA guidelines can be challenging for many people due to various physical, psychological, and environmental barriers (Toft & Uhrenfeldt, 2015; Zabatiero et al., 2016). Thus, patients may benefit from additional support before and after MBS to reach sustainable PA improvement, and to optimize MBS benefits (Bond, 2023).

PA behavioural change interventions warrant attention as their efficacy to increase PA have been established in adults with obesity (Samdal et al., 2017). Additionally, data showed that theory-driven interventions are effective to promote PA in adults (Gourlan et al., 2015; Prestwich et al., 2015). There is thus a clear need for theory-driven PA behavioural interventions to help patients overcome barriers to being more active. However, only a few interventions have been tested in MBS patients, and only one was delivered before MBS (Bond, 2011; Bond et al., 2017). The Bari-Active intervention, a randomised controlled study with 6-week PA behavioural intervention administered prior to MBS, led to noticeable improvements in device-measured MVPA levels as compared to usual care (+16.6 minutes per day vs. -0.3 minutes per day) (Bond, 2011), but it was delivered face-

to-face, which may limit access to the more affluent and those living in proximity to research or MBS centres.

Technology-based tools such as web-meeting software enable new ways for adults from everywhere to participate in behavioural interventions. With the wide reach of the Internet and the ubiquity of connected communication devices (e.g., computers, smart devices), a new age of convenient, scalable, personalized, and cost effective telehealth interventions is emerging. Several studies have demonstrated the positive impact of telehealth interventions on health outcomes (Hutchesson et al., 2015; Kairy et al., 2009; Patel et al., 2019), and PA in adults with and without obesity (Cotie et al., 2018; Hakala et al., 2017). While the efficacy of telehealth interventions in MBS patients has been assessed (Bradley et al., 2017; Coldebella et al., 2018; Messiah et al., 2020), to our knowledge, few studies have investigated telehealth interventions where PA counselling is the primary intervention component. One feasibility study showed the feasibility of a smartphone app to promote PA before MBS (Mundi et al., 2015), one randomized controlled study after MBS is an ongoing study with videoconferencing PA sessions or e-health online platform (Hayotte et al., 2021), and one randomised controlled trial reported no significant increases in step count after online monthly one-on-one 30-minute PA tele-coaching sessions during the six first month after MBS (Lurbe Puerto et al., 2023). Further studies are needed, particularly in pre-MBS patients.

Current study

Before investing human and financial resources in efficacy trials, a cautious approach is recommended by the staged approach to behavioural change intervention development (see the Obesity Related Behavioural Intervention Trials (ORBIT) model (Czajkowski et al.,

2015)). Therefore, the aim of this study was to conduct a multicenter trial using a repeated single-case experimental study design to assess the feasibility and acceptability of the TELEhealth BARIatric behavioural intervention (TELE-BariACTIV) trial protocol/methods and intervention – a theory driven intervention – in adults awaiting MBS. The second aim was to estimate the effect of the TELE-BariACTIV behavioural intervention on MVPA (primary outcome for a future large-scale trial) prior to MBS (primary endpoint). The hypotheses were: i) the protocol/methods and the intervention is feasible and acceptable based on the satisfaction criteria established a priori, and ii) device-measured MVPA is statistically significantly higher during (phase B1) and post-intervention (Phase A2) compared to baseline (phase A1), with a small effect size.

Trial results are reported in three parts. This paper reports on Part I, namely the main data collected before MBS on the primary outcomes [feasibility and acceptability], secondary outcomes [MVPA], and generalization measures [anxiety and depressive symptoms, quality of life, pain]). Forthcoming Part II and III papers will present secondary data on the theoretical-construct measures assessed, and 1-year post-MBS follow-up data.

Materials and methods

Study design

The present open-label multicentre single-case experimental study with multiple baseline data (ABAB'A) is reported following recommendations for single-case protocols in behavioural interventions (Supplemental Files) (Tate et al., 2016). This research design requires a small group of participants to test causal relationships between variables of interest, and allows rigorous experimental manipulation of independent variables and repeated measurements of dependent variables over time to enhance internal validity

(Perdices & Tate, 2009). The observational phases "A" help control for maturation and historical variables, thus serving a function like a control group without intervention (Tate et al., 2016). This design has been used with different clinical populations to study different behaviours, including PA (Caneiro et al., 2019; Clanchy et al., 2019; Kwasnicka et al., 2017; Lapointe et al., 2023), adults before MBS (Quilez-Orden et al., 2020), and is seen as a niche to test personalized obesity treatment (Grammatikopoulou et al., 2022).

The human research ethics committees approved the study protocol (Baillot et al., 2022). Before participation, informed consent was obtained digitally from participants.

Randomization and Procedures

The methods have been described in details elsewhere (Baillot et al., 2022), with any changes described in the Supplemental Files. The following sections describe the methods relevant to the pre-MBS phases (phase A1, B1, and A2) reported in this paper. Participants were randomly assigned to either a 1- or 2-week baseline A1 phase; subsequent phases (phases B1 and A2) were of identical length for all participants. The A phases were observational phases without intervention, and the B phases were interventional with the TELE-BariACTIV. Daily MVPA was assessed for 7 (if randomized to 1 week baseline A1) or 14 days (if randomized to 2-week baseline A1) during the A1 phase, and then for 7 days in phases B1 and A2. The Actigraph Centerpoint was used to download and extract the data. Online Limesurvey© questionnaires were used to assess baseline sociodemographic data (before randomization and phase A1), clinical data, smoking status, and unhealthy alcohol consumption three times (before phases A1, B1, and A2), quality of life, including pain symptoms, anxiety, depressive symptoms, and self-reported MVPA four times (before phase A1, before, during and after phase B1). In addition, acceptability of the protocol and

intervention was assessed using an online questionnaire before and after the intervention (phase B1), and with an online semi-structured individual interview after phase B1.

Recruitment and Participants

Twelve participants were recruited between September 2021 and July 2022 via referral from clinicians from three hospitals, i.e. two associated tertiary care (Quebec Heart and Lung Institute; Sacré Cœur Hospital, Montreal [Centre Intégré Universitaire de Soins et de Services de Santé (CIUSSS) du Nord-de-l'Île-de-Montréal]; and one associated regional centre (Chicoutimi Hospital, Chicoutimi [CIUSSS Saguenay–Lac-Saint-Jean]). The sample size is considered acceptable for this study, where sample sizes range from 2 to 12 (Kazdin, 2011; Tate et al., 2016), and due to the large number of repeated measurements within participants increasing statistical power.

Eligibility criteria

To be included, participants had to: **i)** be aged ≥18 years; **ii)** be scheduled to undergo a sleeve gastrectomy ≥12 weeks at one of the three participating hospitals; **iii)** self-report ≤150 minutes of MVPA per week, and **iv)** have access to a computer with Internet and an interface with a camera. Exclusion criteria were: **i)** having a physical contraindication to PA; **ii)** already enrolled in a supervised exercise intervention or PA behavioural change intervention; **iii)** unable to speak and understand French, or **iv)** needing a wheelchair, cane, walker, or other assistive device(s) to move.

The TELE-BariACTIV Intervention

Full details of the TELE-BariACTIV intervention have been described elsewhere (Baillot et al., 2022). Briefly, the intervention aimed to enhance participants' motivation to participate to PA (via satisfaction of their basic psychological needs of competence,

autonomy, and relatedness) and self-efficacy in relation to PA to promote adoption and continuation of PA. To this end, the intervention was driven by key tenets of the self-determination theory (Deci & Ryan, 1985)) and social cognitive theory (SCT; (Bandura, 1977)), and embedded related motivational and behavioural change techniques (MBCT). The specific TELE-BariACTIV content- and relational-based techniques for each session are described in details elsewhere (Baillot et al., 2022). Participants were offered six 45-minute synchronous sessions before MBS via Zoom©. To facilitate learning and progress, as well as self-reflection, participants received information and worksheets by mail and/or email, depending on their preference. The intervention to all 12 participants was delivered by a woman with a master's degree in Kinesiology. She had received 5 hours of training by the first and last authors beforehand and performed one random practice session that was recorded to receive feedback and better deliver the intervention and improve its fidelity. In addition to the sessions, participants received a PA monitor (A370 Polar© watch) and were encouraged to use it during the intervention to monitor their PA behaviour.

Fidelity

The PA counsellor documented several aspects for each session in a standardized form: attendance, session duration, topics covered, achievement of session goals, view of participant's response to the content, next steps, and personal reflections. The PA counsellor reported that all topics were covered in the 45-minute allotted time, supporting intervention fidelity (Supplemental Files).

Measurements

Primary outcomes

Feasibility

The following protocol/methods feasibility indicators were tracked by research assistants: **i)** refusal rate (% of participants who declined to participate out of participants referred by clinicians, and reasons); **ii)** recruitment rate (number of participants recruited per month), and sources of referral (e.g., professionals, self via poster); **iii)** retention rate (% of participants who complete the four assessments and the interview before MBS out of the participants consenting) with drop-out reasons, and **iv)** % of missing data in the four assessment before MBS (overall/total, per participant, per outcome, and per assessment timepoint). Intervention feasibility indicators that were tracked were: **v)** intervention attendance rate (% of the six pre-MBS sessions completed by each participant and overall), and **vi)** intervention attrition rate (% of participants of those who started who did not complete the intervention as allocated). As previously described (Baillot et al., 2022), the following a-priori satisfaction criteria were chosen and used to analyse our results: i) refusal rate ≤ 20% of participants who declined to participate, ii) recruitment rate ≥ 1.8 participants recruited per month, iii) retention rate ≥ 80% of participants who complete the four assessments and the interview before MBS, iv) % of overall missing data ≤ 10% of data missing in the four assessments before MBS, v) intervention attendance rate ≥ 80 % of overall sessions completed, and vi) intervention attrition rate ≤ 20% who did not complete the intervention.

Acceptability

Participants were asked to complete a 7-item questionnaire developed by the authors based on the "Theoretical Framework of Acceptability" to evaluate the anticipated and retrospective accetability of the intervention (Sekhon et al., 2017). In addition, participants were invited to take part in a semi-structured individual interview via Zoom© to discuss

their thoughts, feelings, and opinions regarding the protocol/methods and the intervention. Interviews were audio-recorded, and conducted by a trained research assistant guided by open-ended questions (Supplemental File).

After each session, the PA counsellor also completed the Technical Quality Assessment Questionnaire to assess the quality and performance of the Zoom© technology platform, and three additional questions to explore the quality of the relationship with the participant, session goal achievement, and global satisfaction (LeRouge et al., 2002).

Secondary outcomes

Device-measured MVPA (primary outcome for a future large-scale trial)

A triaxial accelerometer worn at the hip on the right side (Actigraph© wGT3X-BT) was used to assess daily MVPA (min per day) during phase A1 (7 to 14 days depending on participants' randomization), and during phases B1 and A2 (7 days). Participants were asked to wear the accelerometer during waking hours (except during water-based activities) and keep a log of wear times. Additionally, they were instructed to wear the accelerometer one or two additional days if they missed wear days.

Accelerometer data were extracted from the Actigraph© center point and downloaded (10-second epochs) using Actilife v.6.13.4 software. Only data from participants who wore the accelerometer ≥ 3 days (including at least 1 weekday and 1 weekend day) and ≥ 9 hours per day were analysed (King et al., 2015; Trost et al., 2005). Non-wear time was defined as a period of ≥ 120 minutes of consecutive zeros (King et al., 2011), and Freedson's threshold values of counts were used for analyses (moderate intensity PA = 1,952–5,724 and vigorous intensity PA > 5,724) (Freedson et al., 1998).

Generalization measures (secondary outcomes for future large-scale trial)

To increase the external validity of the study (Tate et al., 2015), generalization measures were performed to assess whether changes in health are generalized to other results in the scientific literature (Clanchy et al., 2019). As detailed elsewhere (Baillot et al., 2022), the Patient Health Questionnaire (PHQ-9) and the Generalized Anxiety Disorder Scale (GAD-7) were used to assess the severity of anxiety and depressive symptoms (Kroenke et al., 2001; Spitzer et al., 2006), respectively. A minimal clinically important difference score ranging from 0 to 10 points on the GAD–7, and 0 to 14 points on the PHQ–9 depending on the range of baseline depressive or anxiety symptom severity was used to perform visual analysis on the effects of the intervention on these outcomes (Bauer-Staeb et al., 2021). Also, quality of life was assessed using the physical and mental health scores of the 36-item RAND questionnaire (Hays & Morales, 2001). A score of three was used as the minimal clinically important difference to perform the visual analysis of the quality of life data (Bond et al., 2015; Stewart et al., 1989; Warkentin et al., 2014; Wyrwich et al., 2005).

Covariables

Baseline sociodemographic (age, sex, education, marital and professional status, number of children, income), clinical data (MBS date, medical conditions, height, weight), and smoking status (non-smoker, smoker, former smoker) were self-reported. Alcohol consumption was assessed using the Alcohol Use Disorder Identification Test-Concise (AUDIT-C) (Bush et al., 1998) and higher scores (out of 12) indicate a greater likelihood of a person's drinking habits negatively impacting their health and functional well-being. The Global Physical Activity Questionnaire (GPAQ; [107]) was used to calculate self-reported sitting time (hours per day), self-reported total MVPA, and self-reported MVPA per domain (work, travel to and from places, recreational activities) (minutes per week).

Accelerometers were also used to measure sedentary time (hours per day), light PA (minutes per week), and daily steps. Sedentary time was defined as activity below <100 counts per minute, whereas light-intensity PA was defined as activity with 100-1,951 counts per minute (Freedson et al., 1998). Finally, pain was assessed using two RAND-36 Physical Pain subscale questions. (Hays & Morales, 2011). A mean score was calculated, with higher scores indicating greater pain intensity.

Internal validity

To increase the internal validity of the study, participants were asked during the interviews whether they had life events that occurred during the study (e.g., illness, new job) that might have influenced the study results, and these were checked against the PA counsellor's notes.

Statistical analyses

Descriptive statistics were used to compute individual and group sociodemographic, clinical, feasibility, and acceptability data. A Tau-U test for each participant and for the group was performed to compare daily device-measured MVPA between phases A1 and B1, and phases A1 and A2 (Parker et al., 2011). Individual effect sizes were aggregated in a meta-analysis to obtain a group-based effect size. A sensitivity analysis was performed with a randomization test (Bulte & Onghena, 2009). All statistical analyses were performed with R 4.2 and the following packages: scan and SCRT (Wilbert & Lueke, 2021).

The minimal clinically important difference scores were used to analyse the generalization measures (quality of life, anxiety, and depression symptoms) in descriptive purpose. The differences in individual scores between phases A1 and B1, and phases A1 and A2 were compared by visual inspection of the data (Lane & Gast, 2014).

Interviews were transcribed verbatim and analysed by AB and JB with NVivo© using content analysis. The counsellor's notes were also analysed using content analysis. First, transcripts and notes were read, then codes were generated that identified relevant features that aligned with the current objectives of assessing protocol/methods and intervention feasibility and acceptability. Next, similar codes were combined to form sub-themes and themes, which were labelled and defined. Last, illustrative quotes from the interviews and notes were selected to show links between the raw data and themes. All names were replaced with pseudonyms, any other identifying information was removed from the quotes, and the quotes were translated to English only after the coding process was finalized by a bilingual research assistant, and reviewed by a native English-speaker (JB) for reporting purposes.

Results

Participants characteristics

Eleven women and one man between 43 and 62 years of age consented to participate in this study. Baseline sociodemographic and medical data, smoking status, and alcohol use score of each participant are presented in **Erreur! Source du renvoi introuvable.**.

Primary outcomes

Feasibility

Recruitment lasted 10 months from September 2021 to July 2022. During this time, 24 patients awaiting MBS were referred to the research team by clinicians; five declined to participate (***refusal rate = 20.8%***), seven were ineligible or unreachable. In total, 12 were enrolled, consented, and completed baseline assessments post-randomization (***recruitment rate = 1.2 participant per month***). One participant dropped out during the baseline phase

due to discomfort with the accelerometer, and one dropped out after completing the six pre-MBS intervention sessions, resulting in a ***retention rate of 83.3%***.

Missing data were examined separately for self-reported (i.e., online survey) and device-measured (i.e., accelerometer) data. It was minimal for self-report as only baseline medication was missing for one participant in the Limesurvey questionnaires, but no other data were missing in the four assessment time points (Table 2). For accelerometer, missing data patterns are in Table 2. The percentage of participants with valid data (≥ 3 days including at least 1 weekday and 1weekend day, with ≥ 9 hours per day) was 100% (11/11) for phase A1, 81.8% (9/11) for phase B1, and 54.5% (6/11) for phase A2.

No participant dropped during the phase B1 intervention offered prior to MBS (***intervention attrition rate=0%***), and the ***intervention attendance rate*** was ***98.6%*** (65/66 sessions were completed); one participant missed the session 6 because their MBS was scheduled before the 6-week intervention end. In terms of length, 91.7% (11/12) of participants received one session per week across the 6-week period as planned; one participant delayed session 3, extending the intervention length to 7 weeks.

Acceptability

Participants anticipated and retrospective acceptability of the intervention were 3.2 (IQR: 0.5) and 3.0 (IQR: 0.2), respectively, on a scale of 4. The mean score for technical quality assessment of all sessions reported by the PA counsellor was 2.8±0.1 out of 3. The mean scores for perceived relationship with participant, session goal achievement, overall satisfaction reported by the PA counsellor were 10.0±0.1, 9.7±0.2 and 9.3±0.4 out of 10, respectively. No adverse events occurred during the sessions. Session details are provided in the Supplemental Files.

Qualitative Results

Eight out of the 11 participants who completed the trial (72.7% of participants) were interviewed for 16 to 49 minutes (median 31.0 minutes (IQR: 11.8)). The transcribed data were summarized into eight themes (noted in boldface in Table 3), which contained several sub-themes (noted in italics in Table 3), and illustrative quotes are presented in the Supplemental Files.

Secondary outcomes

Device-measured daily MVPA

The mean change for device-measured daily MVPA and statistical results are presented for each participant in Table 4; a graphical representation of these data is provided in the Supplemental Files. The global results for the nine participants with valid phase A1 and phase B1 accelerometer data, showed a significant reduction in MVPA from phase A1 to B1 [Tau-$U_{A1\ vs.\ B}$=-0.30 (CI lower; CI higher: -0.37; -0.75) with a MVPA mean change=-0.9 minutes per day (min:-6.2 min per day ; max: 9.7 min per day)], and a significant increase from phase A1 to A2 [Tau-$U_{A1\ vs.A2}$=0.32 (CI lower; CI higher: 0.11; 0.51) with a MVPA mean change=5.6 minutes per day (min:-9.5 minutes per day.; max: 26.2 minutes per day)] (Table 3). Findings from sensitivity analyses (randomisation test) are provided in Table 3.

Generalization measures

At least one minimal clinically important difference for psychosocial outcomes (anxiety and depressive symptoms, quality of life) was reached by 10/11 (90.9%) participants during phase B1 (during the intervention) and during phase A2 (post-intervention) (Supplemental Files).

Regarding self-reported *overall* MVPA, only 1/11 (9.1%) participant reached ≥ 150 minutes per week during phase A2 (post-intervention), and 3/11 (27.3%) had an increase of 30 minutes per week during phase A2 compared to phase A1 (baseline) (Supplemental Files). In terms of self-reported *leisure-time* MVPA, 5/11 (45.5%) participants increased their MVPA by 30 minutes per week from phase A1 to A2 (Supplemental Files). All participants showed stable self-reported sitting time.

Internal validity

Supplemental Files describe significant life events that occurred during the study period for each participant, which may have impacted any reported results. Briefly, one participant reported helping for house renovation during phase A1 (baseline), four reported significant life events during phase B1 (during intervention) (i.e. worrying medical results, severe anaemia and wrist surgery, COVID-19, and two family members passing), and one reported having COVID-19 during the phase A2 (post-intervention).

Discussion

The aims of the present study were to assess the feasibility and acceptability of the TELE-BariACTIV protocol/methods, test the intervention and acquire preliminary data on its effects on MVPA among adults prior to MBS.

Feasibility and acceptability

The quantitative results provide support for the first hypotheses on the feasibility and acceptability of the TELE-BariACTIV protocol/methods and intervention as evidenced by meeting or exceeding a-priori satisfaction criteria. The data collection and intervention were designed to eliminate the need for face-to-face meetings to enhance accessibility, ease, and inclusivity, while addressing barriers to PA and research reported adults awaiting

MBS. This approach appeared to be effective in this regard as evidenced by satisfactory refusal, retention, intervention attendance, and intervention attrition rates.

While the recruitment rate of 1.2 participant per month was below the target rate of 1.8, it was likely explained by COVID-19 pandemic circumstances—i.e., MBS procedures were stopped in Quebec during the winter months of 2021-2022 so it was not possible to include participants, the increased workload of nurses or dieticians involved in the recruitment led to lack of time for research, and flyers and posters were not allowed in the clinic waiting rooms. Moreover, participants were possibly apprehensive about social contact and worried they could not engage in PA in isolation (especially if they did not have PA equipment in their household).

Missing data from the questionnaires were below the expected 10%, possibly due to the close monitoring of the research assistants by email and telephone reminders, as well as the ability for participants to complete questionnaires remotely via Limesurvey. However, missing data for accelerometer based daily MVPA was higher than 10%, which worsened across phases. This amount of missing data was due to the low compliance with wear time guidelines as opposed to device failure. Nonetheless, analysis of each timepoint showed that 100% of participants complied with guidelines, regardless of randomization, and thus had valid data that could be analysed for phase A1. This dropped to 81.8% of participants for phase B1, and 54.5% of participants for phase A2. As a result, this meant that data for only nine participants could be considered when comparing phases A1 and B1, and only six participants when comparing phases A1 and A2. Larger longitudinal cohort studies in participants after MBS reported that 78% (baseline assessment) to 57% (1-year post MBS assessment) of participants had valid accelerometer data (Baillot. A et al., 2023; King et

al., 2012). Comparisons with other studies conducted in MBS adults are difficult, due to variability in protocols (e.g., design, valid wear time criteria, time of assessment).

Qualitative results also provide further support for high acceptability of the TELE-BariACTIV protocol/methods and intervention. Participants who enrolled reported high levels of satisfaction with the research process and the intervention. Participants expressed appreciation for being able to engage and interact with the PA counsellor and the research staff. The acceptability of the intervention was also confirmed by the PA counsellor, having reported good relationships with participants, and high levels of global and technology satisfaction. Intervention timing (pre-MBS), flexibility in scheduling, accessibility with online sessions, and content (motivating, relevant, interesting, understandable, and pleasant) were also appreciated by participants. Other studies reveal adults before and after MBS appreciate telemedicine and telehealth intervention (Baillot et al., 2017; Coldebella et al., 2018). Another aspect that contributed to participants' satisfaction was the benefits they perceived from their participation, such as health, physical fitness, well-being, and mood, which align with past research (Gonzalez-Cutre et al., 2020; Zabatiero et al., 2016). Desirable behavioural changes were also noted by participants (less sitting, moving more) in their interview, though the self-report data did not support less sitting time.

Lessons learned and participant suggestions for improvement

The use of qualitative data enabled the identification of areas for improvements to optimise the TELE-BariACTIV protocol/methods and intervention. Regarding the intervention, participants suggested that adding telehealth supervised exercise training would enhance their experiences. The addition of this component is possible, especially given our previous work that shows it is feasible and acceptable in adults awaiting MBS (Baillot et al., 2017).

Increasing the length (from 6 weeks) to have more sessions and spreading out sessions (from weekly) was also suggested. However, adding more sessions would require additional resources and it is unclear whether such additions would translate into larger behavioural changes. Stepped care interventions could be an alternative for non-responders without engaging excessive additional resources (Roddy et al., 2023). Future studies should assess the cost of the intervention to determine if it is cost-effective, and in turn have cost data to share with stakeholders. The polar watch (A370 Polar© watch), offered to participants to self-monitor their PA, was not extensively appreciated. As self-monitor PA is effective (Conroy et al., 2011), the choice of another monitor with the help of patient partners seems justified for future studies.

Regarding areas for improvement for the methods/protocol, given the negative ethical, scientific, and economic implications of an ineffective recruitment strategy (Gul & Ali, 2010), all other strategies not used in this study need to be carefully considered, and could be added in future trials, such as incentives for clinicians assisting with recruitment (e.g., payment, authorship on research papers), involvement of patient partners in designing recruitment materials design and procedures, telephone reminders, and better communication about the time commitment, potential harms and benefits of the trial (Houghton et al., 2020; Parkinson et al., 2019; Treweek et al., 2018). Missing accelerometer data is also a major concern in research that could bias results (Stephens et al., 2018). Based on the qualitative data and studies conducted in children with obesity and in adults, additional strategies to improve compliance with accelerometer wearing should be implemented in future studies among MBS patients such as scheduled reminders for research assistants and participants, clear instructions for participants, comprehensive user-

friendly schedule of activities/tasks, wrist-worn rather than hip-worn accelerometer, 24-hour wearing protocol, and financial prorated incentives (Tudor-Locke et al., 2015; Xu et al., 2018).

Secondary outcomes

Promoting stronger engagement and continued participation in MVPA among adults receiving MBS is a crucial focus for clinicians. The current results provide preliminary evidence that a theory-based intervention can increase MVPA before MBS. However, there was a significant reduction in daily MVPA during the intervention (phases A1 vs. B1), although sensitivity analysis did not confirm this significant decrease with a p-value above .05 (p=.09). This significant decrease of daily MVPA during the intervention may be explained by life events occurring before (house renovation) and during the intervention (COVID-19, relatives' passing). Also, a reaction effect to accelerometer assessments has been previously observed. It may explain a relatively high level of MVPA during the baseline phase (Konig et al., 2022). Overall, the TELE-BariACTIV intervention yielded a statistically significant increase in MVPA after the intervention (phases A1 vs. A2) that represented a small effect size (Tau-$U_{A1\ vs.A2}$=0.32). While the practical significance of this effect magnitude is unknown, it is in line with the effect size reported in a meta-analysis on the efficacy of theory-based interventions promoting PA in adults (d = 0.31, 95% CI [0.24, 0.37], k = 82) (Gourlan et al., 2015).

Although not one of the primary aims of this study, the results support that behavioural interventions can have positive effects on quality of life, anxiety and depressive symptoms. Nearly all (91%) participants reported clinically important improvements in one or more

outcomes after the intervention. Further investigations are needed to confirm these findings and add to the current low level of evidence (Swierz et al., 2020).

Study strengths and limitations

This study is one of the first steps in the rigorous development of a behavioural intervention aimed increasing MVPA in adults awaiting MBS. The evidence-based, patient-centred and theory-based intervention, as well as the use of distance-based means to collect data and to deliver the intervention are strengths of this study. In addition, the use of complementary quantitative and qualitative methods ensured that participants were given a voice to optimise the intervention and research procedures, and to understand the perceived benefits of the intervention. Finally, the device-based assessment of MVPA limited recall bias and other limitations of self-report questionnaires. However, the present study has some limitations. Given the small sample size, recruited in the province of Quebec during the COVID-19 pandemic, and the inclusion of only one man, the generalisation of the results to larger population and other contexts is limited. Finally, some participants did not have valid accelerometer data, and thus were excluded from the statistical analysis comparing phase A1 to B1, and A1 to A2. Thus, the conclusions could be biased because characteristics of participants with and without valid data could be different.

Conclusion

Both quantitative and qualitative results support the feasibility, and acceptability of the TELE-BariACTIV protocol/methods and intervention, despite a low recruitment rate, which may be partly explained by the unique circumstances of the COVID-19 pandemic. This study provides the first evidence of a potential effects of the TELE-BariACTIV on

daily MVPA. These promising findings warrant testing of the TELE-BariACTIV intervention in a future efficacy trial.

Funding: This research did not receive any specific grant.

Acknowledgements: The authors would like to thank Maxime St-Pierre, Mélanie Nadeau, Annie Quesnel, Mélissa Pelletier and Mélanie Belley for assisting with the recruitment of participants and data collection, Karine Lavallée for conducting the interviews, Jenson Price for contributing to the intervention, and Felix-Gabriel Duval for managing the accelerometer data. Maxime St-Pierre received a scholarship grant from the Regroupement intersectoriel de recherche en santé de l'Université du Québec (RISUQ). AB, and AJR are recipients of salary awards from the Fonds de recherche du Québec-Santé (FRQ-S). JB is supported by a Tier II Canada Research Chair in Physical Activity Promotion for Cancer Prevention and Survivorship.

Data availability: The R syntax for main analyses are provided on the Open Sciences Framework (https://osf.io/vpmzf/). Raw MVPA, light PA, sedentary time, daily steps and pain score data are available in Supplemental Files. Other data described in the manuscript, and code book will be made available on request pending application.

Appendix A. Supplementary data can be found online at https://osf.io/vpmzf/

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Table 1. Participants characteristics (n=12)

Participant	Age (years)	Sex	Marital status	Number of children	Professional status	Level of education	Income ($)	Ethnicity	BMI ($k.m^2$)	Medical conditions	Smoking status / Alcohol consumption score
1 G1	56	F	Married	3	Full-time	Pre-University	50,000-74,999	White	44.4	HTN, Dys, OSA	Former smoker / 1
2 G1	46	F	Civil union	4	Full-time	University	75,000-100,000	White	42.0	HTN, Dys, T2D, OSA, Ar, MH, Derma	Non-smoker / 0
3 G1	50	F	Separated	2	Full-time	University	75,000-100,000	White	46.1	T2D, OSA, Ar, RespiD	Non-smoker / 2
4 G2	51	F	Married	0	Full-time	High school	>100,000	White	48.2	HTN, OSA, Ar, MH	Former smoker / 0
5 G2	44	F	Civil union	3	Unemployed	High school	<25,000	White	53.6	HTN, T2D, Ar	Non-smoker / 0
6 G1	56	F	Married	3	Part-time	Pre-University	75,000-100,000	White	46.0	T2D, OSA, Ar, CVD, RespiD, MH	Former smoker / 1
7 G2	59	F	Single	0	Retired	University	25 000-49 999	White	54.8	HTN, Dys, T2D, OSA, RespiD, Derma	Former smoker / 3
8 G1	46	H	Single	0	Full-time	High school	50,000-74,999	White	54.4	Dys, OSA, CVD, MH	Non-smoker / 0
9 G1	62	F	Married	2	Full-time	High school	>100,000	White	35.0	HTN, OSA	Non-smoker / 2
10 G2	61	F	Divorced	2	Full-time	University	>100,000	White	51.2	OSA, Ar	Former smoker / 2
11 G2	43	F	Married	3	Medical leave	Pre-University	75,000-100,000	White	44.9	HTN, OSA, Ar, RespiD, MH	Former smoker / 3
12 G2	45	F	Married	2	Medical leave	High school	25,000-49,999	Hispanic	47.20	Dys, T2D, OSA, Ar, CVD, RespiD, MH	Smoker / 0
Total	50.5	92% F	66.7% in couple	2	58 % Full-time	66.7% ≥ Pre-University	58.3%≥ 75 000	91.7% White	46.6	83.3 % ≥ 3 medical conditions	Smoker

G= group; HTN = Hypertension; Dys = Dyslididemia; T2D = Type 2 diabetes; OSA = Obstructive sleep apnea; Ar = arthritis/osteoarthritis; CVD = Cardiovascular disease; MH = Mental disorder; Derma = Dermatosis; RespiD = respiratory diseases; Total numbers are expressed in % or median

Table 2. Feasibility and acceptability outcomes

Participants	Counseling sessions					Research methods			
	Number of sessions completed	Duration of sessions (min)	Attrition (Y/N)	Acceptability anticipated score	Acceptability retrospective score	Number of online surveys completed [% missing data in completed survey]	Interviews completed (Y/N)	Number of accelerometer wear days: phases A1; B; A2	Number of days with valid accelerometer wear time (9h per day): phases A1; B; A2
1 G1	5	36.0 (29.5-46.5)	N	3.4	3.5	4 [0%]	N	7; 7; 0	7; 7; 0
2 G1	6	41.5 (35.3-49.5)	N	3.4	2.9	4 [0%]	Y	7; 7; 7*	7; 7; 7
3 G1	6	40.5 (34.3-46.3)	N	3.1	2.9	4 [only medication]	N	5; 6; 6*	4; 5; 5
4 G2$^{\infty}$	Did not receive the allocated intervention			-	-	1 [0%]	-	4; -	1; -
5 G2	6	42.0 (35.0-45.5)	N	-	3.0	4 [0%]	Y	13*; 0; 0	5; 0; 0
6 G1	6	49.0 (45-55.5)	N	3.3	3.4	4 [0%]	Y	7; 7; 0	6; 6; 0
7 G2	6	45.0 (41.3-49.8)	N	3.5	3.0	4 [0%]	Y	14; 7*; 9*	12; 7; 7
8 G1	6	45.5 (44.3-47.8)	N	2.1	3.1	4 [0%]	Y	7; 7; 7*	6; 6; 7
9 G1	6	34.0 (26.0-45.0)	N	3.0	3.0	4 [0%]	N	7; 0; 0	7; 0; 0
10 G2	6	47.5 (43.8-52.0)	N	3.5	2.9	4 [0%]	Y	11*; 7; 0	10; 7; 0
11 G2	6	47.0 (44.3-50.5)	N	2.5	2.9	4 [0%]	Y	14; 7; 7	14; 6; 6
12 G2	6	50.0 (48.8-57.5)	N	3.2	3.1	4 [0%]	Y	14; 7; 7	13; 7; 7
Total	98.5%	45.0	0%	3.2	3.0	98%	73%	94.6%;80.5%; 55.8%**	81.3%;75.3%;50.7%**

* not on consecutive days; $^{\infty}$ Withdraw the study because disliked wearing the accelerometer; Total number are expressed in % or median; ** = number of accelerometer wear days (or valid) /number of wear days required x 100 excluding participant who dropout.

Table 4. Comparison of moderate-vigorous physical activity accelerometry data between phases A1 and B1, between phases A1 and A2.

Participants	**A1 vs. B1**			**A1 vs. A2**		
	Mean change (minutes per day)	Tau (CI lower; CI higher)	Randomisation test p-value	Mean change (minutes per day)	Tau (CI lower; CI higher)	Randomisation test p-value
1	-2.48	-0.37 (-0.75; -0.20)	.60	.	.	-
2	9.67	0.14 (-0.42; 0.63)	.60	26.21	**0.63 (0.15; 0.87) ***	.13
3	-6.24	**-0.80 (-0.96; -0.29) ***	.80	-0.64	0.11 (-0.60; 0.72)	.66
6	-1.86	0.11 (-0.64; 0.49)	.80	.	.	-
7	-8.21	-0.40 (-0.73; 0.06)	.31	-9.52	-0.12 (-0.54; 0.35)	.13
8	-1.06	-0.39 (-0.79; 0.24)	.40	8.79	0.10 (-0.48; 0.61)	.33
10	5.19	0.17 (-0.34; 0.60)	.17	.	.	-
11	-0.64	-0.04 (-0.47; 0.41)	.08	6.94	**0.63 (0.27; 0.84) ***	.08
12	-2.75	**-0.72 (-0.88; -0.41) ***	.50	1.52	0.29 (-0.17; 0.65)	.17
Total	-0.93	**-0.30 (-0.37; -0.75) ***	.09	5.55	**0.32 (0.11; 0.51) ***	**<.002**

*= p≤.05; CI = coefficient interval

Table 3. Themes and sub-themes based on content analysis of interviews (n=8)

Outcome expectations
Participants had several reasons for participating in this study, which related to the *intervention* and *research*. For the former, they regarded the intervention as a means to receive support from a professional, gain knowledge, improve their physical condition and health, and get help initiating and maintaining an active lifestyle. For the latter, they believed they could help others and contribute to research. However, some participants indicated they had not expectations driving their motivation to participate in the intervention or study.
Intervention likes
Participants talked about 5 main components they liked about the intervention and that motivated them to engage in increasing their PA. These were: *Engagement and interaction with the PA counsellor*, *Content*, *Material*, *Modalities*, and *Non-specific*. Participants valued the counsellor and referred to her attributes and acting qualities. By being encouraging, non-judgmental, helpful, empathetic, attentive, positive attitude, confident in participants, accessible, and available, it was much easier for them to connect with her and share their experiences, feelings, and obstacles. They discussed ways in which the counsellor delivered content energenically, passionionately, humourously, and competently, which acted as a means of motivation for them to remain in the intervention. Besides the counsellor, participants talked about how the *Content* met their specific needs; while covering considerable breadth, the content was flexible enough for the counsellor to adapt it to each participant's own lifestyle. Participants noted that the intervention was a source of relevant information for them learn from or review that happened to be motivating, relevant, interesting, understandable, and pleasant, and they found it useful to receive related tips and examples. Additionally, participants talked about two main components that would motivate them in-between sessions with the counsellor. The first was having access to different tool, such as videos, which could then assist participants in making decisions about PA. The second was the activity sheets, which they could complete in real time with the counsellor (e.g., setting goals) and/or consult as needed (e.g., diary to see their progress or problems). Relatedly, participants liked receiving a PA monitor as *Material* because it was a motivating way for them to track their PA behaviour. Participants also valued the *Modalities*. They indicated that the length and pace were appropriate, especially because the counsellor could adjust timeframes as necessary, and they felt it was easy to connect because they could schedule sessions at their convenience and join from wherever. They also discussed the importance of receiving it both prior to and after MBS. Finally, their high satisfaction ratings with the intervention and support for future implementation provide further evidence to suggest that the intervention was acceptable to participants.
Research likes
Participants talked about 4 main components they liked about the protocol/study methods and that motivated them to engage in increasing their PA. These were: *Interaction with research staff*, *Content*, *Material*, and *Non-specific*. Participants remarked that the research staff available, effective in their communication, offered understandable instructions, and conducted assessments professionally as they were courteous, respectful, and sympathetic. Additionally, the *Content* (i.e., written instructions) were understandable and participants reported that they were comfortable following the protocol for the accelerometer because they did not view it as too burdensome or invasive. Finally, their high satisfaction ratings with the research and support for future implementation also suggest that the research protocol/study methods were acceptable to participants.
Intervention dislikes

Participants discussed dislikes about the intervention that could thwart their motivation to engage in the intervention. These formed 3 subthemes: *Content*, *Material*, and *Modalities*. One identified dislike was that participants were interested in receiving supervised PA training, and thus commented that it was lacking from the intervention content. Also, participants reported skipping doing activity sheets if they believed they were redundant; they did not view them as useful. In terms of the *Material*, participants noted that they were not comfortable using the Polar watch. They indicated that, due to its features, functionality, and poor perceived accuracy, they felt that other devices would be better. Furthermore, as *Modalities* preferences vary among participants, some participants found it difficult to engage in sessions because their children disrupted their concentration. Dosage (i.e., session duration, intervention length, amount and pacing of sessions) was also an issue for some participants. In particular, they noted that it was 'not long enough' and not spread out enough for them to adapt their own lifestyle and routine.

Dislike about research

Participants provided 3 subthemes for dislikes about the protocol/study methods: *Content*, *Material*, and *Modalities*. Identified issues with the content were that the questionnaires were long, comprised redundant, unclear, or ambiguous items, and information provided about the intervention components was incomplete. Some participants viewed some of the *Material* as bothersome and non-user friendly (i.e., accelerometer) or burdensome and pointless (i.e., journals). Last, in terms of *Modality*, one issue some participants noted was that research staff did not provide clear instructions about the accelerometer protocol, which led them to feel guilty about not adhering to the protocol. It was also noted that frequency of communication was insufficient, and, there was not enough follow-up by research staff to ensure participants completed research-related tasks on time.

Benefits to participants

Participants described how the intervention positively impacted their *Physical*, *Psychosocial*, and *Behavioural* functioning. They indicated reduced fatigue, improved general and heart health, and enhanced physical condition as a result of engaging in more PA. Additionally, participants reported that the intervention allowed them to release negative emotions and improve their mood and wellbeing. They also felt the intervention facilitated interactions with others, including family, which in turn led them and their families to become more motivated collectively to engage in PA. In turn, participants engaged in more PA with their families, allowing them to spend more time together whilst moving more, sitting less, and doing new activities.

Still, being involved in the intervention did not change *Physical*, *Psychosocial*, and *Behavioural* functioning for some participants, which they believe were attributable to their PA behaviour remaining unchanged or not having changed for long enough. As well, one participant reported worsened pain.

Recommendations for future

Whilst participants were generally satisfied with the intervention and protocol/study methods they provided suggestions that could help better align the *Intervention* and *Research* with their needs and preferences. First, participants felt to further promote PA behaviour change and improvements in functioning they would require psychological care *and* exercise training sessions. Second, participants noted that making sessions longer and offering them across a longer timeframe (especially after MBS) could facilitate further changes for those seeking additional support. Third, future research should employ a variety of strategies to help participants successfully complete research tasks and provide participants with a comprehensive user-friendly schedule of activities/tasks. Fourth, participants highlighted the importance of having someone who could: support participants while they perform assessments and communicate with participants more often. Last, they indicated that they should be more opportunities for participants to share their perspectives and suggested adding open-ended questions.

PA=physical activity

Supplemental File. The Single-Case Reporting guideline In BEhavioural interventions (SCRIBE) 2016 Checklist

Item number	Topic	Item description	Notes
TITLE and ABSTRACT			
1	Title	Identify the research as a single-case experimental design in the title	1. Page 1
2	Abstract	Summarise the research question, population, design, methods including intervention/s (independent variable/s) and target behaviour/s and any other outcome/s (dependent variable/s), results, and conclusions	2. Page 4
INTRODUCTION			
3	Scientific background	Describe the scientific background to identify issue/s under analysis, current scientific knowledge, and gaps in that knowledge base	3. Page 6-7
4	Aims	State the purpose/aims of the study, research question/s, and, if applicable, hypotheses	4. Page 7-8
METHODS			
	DESIGN		
5	Design	Identify the design (e.g., withdrawal/reversal, multiple-baseline, alternating-treatments, changing-criterion, some combination thereof, or adaptive design) and describe the phases and phase sequence (whether determined *a priori* or data-driven) and, if applicable, criteria for phase change	5. Page 8-9
6	Procedural changes	Describe any procedural changes that occurred during the course of the investigation after the start of the study	6. Page 9 + Suppl. File. Procedural changes (Page 2)
7	Replication	Describe any planned replication	NA
8	Randomisation	State whether randomisation was used, and if so, describe the randomisation method and the elements of the study that were randomized	8. Page 9
9	Blinding	State whether blinding/masking was used, and if so, describe who was blinded/masked	NA
	PARTICIPANT/S or UNIT/S		
10	Selection criteria	State the inclusion and exclusion criteria, if applicable, and the method of recruitment	10. Page 10
11	Participant characteristics	For each participant, describe the demographic characteristics and clinical (or other) features relevant to the research question, such that anonymity is ensured	11. Page 16 and Table 1
	CONTEXT		
12	Setting	Describe characteristics of the setting and location where the study was conducted	12. Page 10-11 + telehealth
	APPROVALS		
13	Ethics	State whether ethics approval was obtained and indicate if and how informed consent and/or assent were obtained	13. Page 9
	MEASURES and MATERIALS		
14	Measures	Operationally define all target behaviours and outcome measures, describe reliability and validity, state how they were selected, and how and when they were measured	14. Page 11-15
15	Equipment	Clearly describe any equipment and/or materials (e.g., technological aids, biofeedback, computer programs, intervention manuals or other material resources) used to measure target behaviour/s and other outcome/s or deliver the interventions	15. Page 10-15
	INTERVENTIONS		
16	Intervention	Describe intervention and control condition in each phase, including how and when they were actually administered, with as much detail as possible to facilitate attempts at replication	16. Page 10-11
17	Procedural fidelity	Describe how procedural fidelity was evaluated in each phase	17. Page 11
	ANALYSIS		
18	Analyses	Describe and justify all methods used to analyse data	18. Page 15-16
RESULTS			
19	Sequence completed	For each participant, report the sequence actually completed, including the number of trials for each session for each case. For participant/s who did not complete, state when they stopped and the reasons	19. 16-19 + Supplemental files.
20	Outcomes and estimation	For each participant, report results, including raw data, for each target behaviour and other outcome/s	Supplemental files + Tables 1 and 2
21	Adverse events	State whether or not any adverse events occurred for any participant and the phase in which they occurred	21. Page 17
DISCUSSION			
22	Interpretation	Summarise findings and interpret the results in the context of current evidence	22. Page 19-23
23	Limitations	Discuss limitations, addressing sources of potential bias and imprecision	23. Page 23-24
24	Applicability	Discuss applicability and implications of the study findings	24 Page 22-23 + conclusion
DOCUMENTATION			
25	Protocol	If available, state where a study protocol can be accessed	25. Page 9
26	Funding	Identify source/s of funding and other support; describe the role of funders	26. Page 3, 24-25

Supplemental File. Procedural changes

Data collection

The interview timeframe was expanded from "1 to 4 weeks after phase B1" to "1 week after onwards" (i.e., no maximum time) because of difficulties scheduling interviews. This was to ensure a maximum number of participants could be interviewed and reduce potential biases. Among the eight participants interviewed, the median time elapsed after phase B1 was 3.6 (IQR 4.5) weeks, with three participants interviewed > 4 weeks after phase B1 due to holidays, lack of availability, or difficulty in attending (range: 5-19 weeks after phase B1).

Data analysis

The criteria for analyzing accelerometer data of "≥ 10 hours per day" were changed to "≥ 9 hours per day" to increase statistical power and to avoid sample bias (Colley et al., 2010). Thus, 14 days (including 6 days for participant 3) were added to the 174 days with ≥ 10 hours per day of data for a total of 188 days with ≥ 9 hours per day of data.

Some participants wore the accelerometer during waking and sleep time (i.e., 24 hours a day; 4 participants phase A1, four participants phase B1 and three participants phase A2). To remove night time data, Tudor-Locke et al. (2014)' decision rule was used by two independent reviewers [redacted] to assign bedtime and waketime (as wear time logs were poorly completed). Conflicts between reviewers were resolved after discussion with the first author [redacted]

Limesurvey questionnaire completion did not always occur 1 to 3 days before, in the middle and after phase B1 by participants. Nonetheless, rather than exclude data, all data from the questionnaires were presented and visually analysed as this is a feasibility study (see Supplementary Tables for details).

Whereas thematic analysis was initially proposed, content analysis techniques were used to analyze the qualitative data. Although similar to thematic analysis (and sometimes used interchangeably) (Vaismoradi et al., 2013), content analysis allowed [redacted] to code the data and develop themes from the interviews and notes, which was used to evaluate feasibility and acceptability.

Supplemental File. Semi-structured interview guide

Question 1

Quelles étaient vos attentes à l'égard du projet de recherche lorsque vous avez été contactées pour la première fois?

Question 2

Vos attentes ont-elles été satisfaites? Si oui - comment? Si non, pourquoi?

Question 3

Quelles sont vos impressions générales sur l'intervention reçue et le projet de recherche auquel vous avez participé (mode de diffusion, contenu, fréquence, durée, etc.)?

Quelles ont été les parties les plus utiles?

Quelles ont été les parties les moins utiles?

Qu'est-ce qui n'a pas bien fonctionné pour vous?

Y a-t-il des moyens d'améliorer l'intervention ou les évaluations de recherche ?

Si vous pouviez changer une chose, quelle serait-elle?

Question 4

Avez-vous rencontré des obstacles ou des problèmes lors de votre participation à l'intervention ou au projet de recherche?

S'il vous plaît, expliquez.

Question 5

Votre participation à l'intervention a-t-elle eu un impact sur vous?

Quels changements avez-vous perçue par rapport à votre santé physique et / ou mentale, ainsi qu'à votre bien-être?

Quels changements avez-vous perçue par rapport à votre fonctionnement social et à la qualité de vos relations personnelles?

Question 6

Comment votre vie a-t-elle changé depuis votre participation à l'intervention?

Quelles activités de la vie quotidienne ont changé?

Quelles activités personnelles ou sociales ont changé?

Comment l'intervention vous a-t-elle aidé à changer les choses de manière positive?

Question 7

Quelles ont été vos expériences avec la personne qui a dirigé l'intervention?

Pensez-vous qu'elle a soutenu votre engagement? Pourquoi/pourquoi pas?

Qu'aurait-elle pu faire différemment pour vous soutenir davantage et améliorer votre expérience avec l'intervention?

Qu'est-ce que vous avez aimé / n'avez pas aimé dans vos interactions avec elle?

Question 8

Quelles ont été vos expériences avec les personnes qui vous ont suivi pour la partie recherche (recrutement, évaluation, etc.) ?

Qu'auraient-elles pu faire différemment pour vous mettre davantage à l'aise et améliorer votre expérience avec le projet de recherche?

Qu'est-ce que vous avez aimé / n'avez pas aimé dans vos interactions avec elles?

Qu'avez-vous le plus/moins aimé de leur comportement?

Question 9

Participeriez-vous à nouveau à une intervention similaire à l'avenir?

Participeriez-vous à nouveau à ce type d'étude à l'avenir?

Question 10

Recommanderiez-vous l'intervention à un ou une ami(e)?
Recommanderiez-vous à un ou une ami(e) de participer au projet de recherche?

Question 11

Sur une échelle de 1 à 10, 10 étant extrêmement satisfait, comment évalueriez-vous votre niveau de satisfaction à l'égard de l'intervention dans son ensemble?

Veuillez expliquer votre score.

Sur une échelle de 1 à 10, 10 étant extrêmement satisfait, comment évalueriez-vous votre niveau de satisfaction à l'égard du projet de recherche dans son ensemble?

Veuillez expliquer votre score.

Question 12

Durant votre participation au projet, y a-t-il eu des facteurs ou des évènements importants pour vous qui ont pu influencer votre pratique d'activité physique (e.g. divorce, blessures, maladie, confinement…) ?

Si oui, quels sont-ils selon vous?

Question 13

Y a-t-il autre chose lié à l'intervention ou au projet de recherche dont vous aimeriez discuter que nous n'avons pas couvert?

Table S1. TELE-BariACTIV intervention sessions details

Sessions	Duration of sessions (min)	Technology satisfaction score (/3)	Perceived relationship quality with the participant score (/10)	Session goals achievement score (/10)	Overall satisfaction score (/10)
1	48.8±3.8	2.6±0.2	10.0±0.0	9.7±0.6	8.7±0.9
2	45.2±6.2	2.9±0.2	9.7±0.9	9.3±1.3	8.8±1.2
3	38.5±6.7	2.8±0.2	10.0±0.0	9.8±0.4	9.5±0.7
4	41.7±7.2	3.0±0.1	10.0±0.0	9.8±0.4	9.7±0.5
5	44.0±10.5	2.8±0.4	10.0±0.0	9.9±0.3	9.6±0.5
6	47.4±11.0	2.8±0.2	10.0±0.0	9.8±0.6	9.5±1.0
Total	44.3±3.8	2.8±0.1	10.0±0.1	9.7±0.2	9.3±0.4

Table S2. Interviews transcripts

Themes	Sub-themes	Unit of meaning - code	Verbatim
Outcome expectations	*Intervention*	Receive informational, instrumental, and health professional support Gain knowledge Improve physical condition and health Get help to initiate and maintain PA	« It was about helping me to get into better shape, and for me, it reassures me to be, you know, healthier before the surgery, and then afterwards, well, I think to myself, I won't be able to eat big meals anymore. I'm going to switch that focus to physical activity because it's really challenging for me. » P2 « Also, you know, people go through experiences, and not all of them go well. That's why, you know, I thought it could be nice to be supported or guided through them. » P7
	Research	Help others like themselves Contribute to research	« And I didn't mind getting involved so that it could also promote activity and research. » P3 « Actually, I find it enjoyable to get involved, it's like validating the project in reality. »
	None	No expectations	« I didn't have any expectations. » P1 « I didn't have any expectations. I didn't know what I was getting into. It's the first time I've gotten involved in this kind of thing, you know. »
Intervention likes	*Engagement and interaction with the physical activity counselor*	Reference to the counsellor's attributes and acting qualities, including: encouraging, non-judgmental, helpful, empathetic, attentive, positive attitude, confident in participants, accessible, and available. Reference to the extent that the counsellor delivered content energenically, passionionately, humourously, and competently.	« Ah, I found her great. A good experience, like I was saying, she was energetic, fun, and easy to approach. She answered all my questions. She was great (laughs). I would come out of there motivated. » P1 « And it's the fact of having someone who supports me. Just that helps me to continue despite all the challenges I have. » P2 « Very good. She was very comfortable and she was funny too. I felt really comfortable with her. » P3 « The approach that "the PA counsellor" had with me was suitable for me. It was a non-judgmental, motivating approach that was not moralizing. It wasn't about using the whip, but I wanted to please her. You know, it's all about attitude and the relationship. » P7 « She listened to me, I think that's important too. » P8
	Content	Descriptions of the intervention as a source of relevant information to learn or review, as well as receive tips and examples. Reference to exercises/activity sheets in-between sessions Extent that content was motivating, relevant, interesting, understandable and pleasant Content breadth Capacity for the counsellor to deliver personalized context and adjust timeframes as necessary. Different ways of delivering information, including videos.	« I enjoyed it, the meetings, the topics... Uh, the examples, the questions, the answers to my questions. » P1 « Well, it also helps us a lot with, uh, it provides us with more information about things that sometimes we didn't know we could do, even if sometimes we can't move much. And, uh, it gives me tricks. » P3 « You know, I was learning something new every time, and I found that very interesting. » P4 « Yeah, we talked and everything was fine. There were some parts that were less fun, but it's useful that it was there. » P6
	Material	Monitor to track PA is motivating	« And wearing the device as well, I would say that, I don't know, it's psychological maybe, but it seems to motivate me too. » P5

			« With a little booklet to better track, we take notes and so on, it's really good. The message that came across was also good. It's quite comprehensive. » P5
	Modalities	Length and pace of the sessions was appropriate Delivery modality; reference to convenience and flexibility Benefit to start before surgery and continue after surgery	« By zoom, it's perfect because, you know, we can do it from home, and we don't have to travel. » P2 « It was also nice, once a week with «the PA counsellor". » P4 « That's right, that's why it's a good thing that I don't remember exactly how long it was after the surgery. But I know I will talk to «the PA counsellor" about it again. So, in a way, it's good because there's continuity, and at the same time, you know, I could ask her for advice. » P8 « But otherwise, you know, every time I found the meetings were quite long. » P6
	Non-specific	High satisfaction ratings with the intervention Supportive of future implementation of the program	« There isn't anything that I didn't like. I appreciated everything I could gain. » P1 « In fact, yes. I would recommend it. I'm sure that, you know, health (audio bugs). If it applies to someone who experiences something similar to what I was going through before and needs some help to stay motivated, I think it's a good program. " P5 "And as for the intervention part, trying to change physical activity habits, I would rate it at 8.5, that's my favorite part." » P7
Research likes	*Interaction with research staff*	Reference to the ways staff were available, communicated well, offered understandable instructions, and conducted assessments professionally as they were courteous, respectful, and sympathetic.	« No, it was excellent. I think that we had a meeting to explain things a bit. I have regular follow-ups. They frequently send me questionnaires and he keeps track. If I have any questions, he is available. » P1 « It was always courteous, polite, no issues. When I had a question, he would answer me. » P7 « If there were any questions, I could contact him. You know, without any problems, so it was okay. » P6
	Content	Text is understandable	« I spoke to "the research assistant" at the beginning over the phone, and even with him, it was like I understand what he's saying, so I don't need to spend an eternity on explanations. » P5
	Material	Extent to which the accelerometer protocol was realistic and wearing it did not interfere with daily activities.	« For the other device, I found it a little bothersome at first. The elastic, the attachment, and everything. But after that you get used to it (interviewer nods). And you get so used to it that you forget to take it off when going into the water. » P4 « Actually, it's plug and play, as they say. When you plug it in, it asks to download an application, and then every time you re-plug it in, the application opens to transfer the data. I mean, at that moment, I leave it plugged in to charge, and when Max sends a message to wear it again, I wear it, and it's not bad. It's okay, but no, it's not complex, no. The only thing is that it requires a computer to work... So, I have a computer, but for someone who doesn't have one, it might be complex. »P5 « You know, I don't know if others had difficulties with it, but there was maybe once that I forgot it. But other than that, I had it with me all the time. I had it 24/7, I even slept with it, so no, it wasn't a problem. » P8
	Non-specific	High satisfaction ratings with the research process Supportive of future implementation of the research	
Intervention dislikes	*Physical activity counselor*	No comments from particpants	

	Content	In-between session work duplicates specific research tasks (PA monitoring) Intervention does not feature exercise training	« She also wanted me to keep a journal, but I felt like it was sort of duplicating the work I was doing with «the research assistant" , which I wasn't doing either. Like I was saying you know, it's like (both laugh). So, I skipped that step, just to be frank. » P4 « I would've thought, though, that maybe we would've done a quick 10-minute exercise, but that didn't happen, so that's it. » P4
	Material	Features and functionality of the Polar watch Ineffective watch	« No, that watch annoyed me. I tried at some point to use it to track my steps, but I couldn't figure it out. I said, 'You're staying in the bag.' So, I put a pedometer on my phone instead. But it's ridiculous because the thing is, if you don't have your phone with you, well, it won't track the steps you've taken. In a way, yes, it's better to have a watch (coughs). But not that one (everyone laughs), no! » P8
	Modalities	Delivery modality; reference to inconveniences when children present at home. Session length, number and pace, as well as intervention length were inadequate (i.e., too short); reference to difficulties implementing change	« The shortcomings, apart from it not being long enough » P2 « Well, especially the after, having support, so especially after. We have like 3 months, that after that I think there's only one call per month, and that's really really not enough. That, I find it sad that it's like that, because I know I would need more than that. » P2 « No, of course, when the children were on vacation, and we were on Zoom, I tried to tell them not to disturb too much. I had to focus, but sometimes my son would come and check who I was talking to. » P3 « Not enough. Maybe I would have taken more. I was disappointed when she told me that the next one would be the last. » P6 « That's where the meeting time is maybe a bit tight at 1 hour. » P5 « As I mentioned, I would have preferred to have more of it. You know, if I had more time, I would probably have better integrated those habits because I would have had that little support, you know? Some things in life you can do alone, and I find that there are other things that are not your story. » P7
Dislike about research	*Interaction with research staff*	Lack of clear instructions from research assistant about accelerometer port Lack of follow-up by the assessor	« You know, I didn't have much interaction. I had some at the beginning, but even though it wasn't very clear because I misunderstood. At first, I used to wear the device all the time. » P2 « So, that's it. He would write to me so that I could complete the questionnaire. I think there was one time when he forgot about me. »
	Content	Long, redundant questionnaires Difficult to understand questionnaire Ambiguity of questions Explanation of the intervention before the first meeting not always clear	« Yes, that's true. But sometimes the questionnaire, I don't really understand it, but I sent it anyway. » P3 « That, I found that it was a bit, a bit long. Like the questions covered various aspects, like the emotional sometimes and the physical. That's what I found was always coming back, it was redundant, as they say. » P4 « There's repetition. I found it a bit, well, strange. And sometimes, it's just like the wording of the answer that I was like, it wouldn't have been said better this way (both laugh). » P5 « Ah, the questionnaires! They're a pain. I mean, there's like a trap. The questions are asked three times, it's never quite right, there's no elaboration, and they all look the alike, you know, from one week, from one questionnaire to another. They're almost identical. » P7 « At the beginning, before the first actual meeting with «the PA counsellor" , I didn't really know that. But what was unclear at the beginning of everything was what to expect. But once I met «the PA counsellor" , she told me what was going to happen and what to expect. Before that, I was expecting, I thought she would make me workout programs or that she would tell me what to do, you know, something like that. » P6

	Material	Accelerometer; reference to device wear Journals were too long and pointless	« And as for the other device, I found it a bit bothersome at the very beginning with the elastic, the attachment, and all. But after that, well, you get used to it (interviewer nods). So much so that sometimes you forget to take it off when you go into the water. » P4 « I had understood that it was necessary, and it started to be, it was heavy. You know, because to write all the time, when you go to bed, what you did. » P2 « Well, the fact that, with "the research assistant", we have to fill out a form every day. And me, I didn't detail it like «the research assistant" , I'm not sure what he's expecting (laughs), seeing that I wore the device as well. So, me, for the most part, it was work-related. » P4
	Modalities	Insufficient exchange/contact/support	« You know, because I feel that in that aspect, you're left more on your own. You know, it's nice that he calls and explains, he says you'll have forms, but it seems there's no contact from that side. It's like we're left more to ourselves. » « So, this time, I had to, let's say, not wear the belt on Monday, and in the end, I have no idea what happened, but it went all the way to Saturday. » P6
Benefits to participants	*Physical*	Reference to the intervention as helpful to reduce fatigue, improve overall health and heart health, and enhance physical condition.	« I feel more solid, I feel more upright. » P2 « And with the steps, I was less out of breath. You know, it was easier to, I live on a hill here, and it was easier to walk back up to my place. » P7
	Psychosocial	Reference to the intervention as helpful to improve mood, wellbeing, and collectively motivating each other [in the family] to engage in behaviour change, as well as facilitating social contact.	« But, of course, it has an impact on the family too. Now, we are trying to be more active as a family. » P1 « It brought me a sense of well-being right away, I noticed that something changed quickly. » P2 « But yeah... that's it. I really try to take the positive aspects of it, it puts me a bit in a better mood. It makes me want to go out, I see people more often » P5 « But I have to admit that when I made the effort to move, you know, it felt good. I was happy, and I was proud of myself. » P7 « So, I think it's going to influence her, but I want to do even more. Besides, sometimes I go alone after dinner, and then suddenly my daughter follows me! » P6
	Behavioral	Reference to the intervention as helpful to engage in behaviour change and spend time with family actively; descriptions of moving more, sitting less, and trying new activities.	« It also improved my ability to exercise. The goal of this was to develop a habit to do, to move. » P1 « To move more and, to move more, and to pay more attention to myself, let's say. » P5 « But, in fact, the impact so far is positive. I try to apply as much as possible what «the PA counsellor" and I discussed. You know, moving a bit more, and as I said, because I don't walk much, I have to find other ways to move. I do exercises, little things on a chair, and I try to walk as well. Like 15 minutes here and there, even if it's walking half an hour in a shopping mall, like from one store to another, things like that. I don't do it quickly all the time (small laugh), but I mean, it gets done. » P5 « It's like, during those 6 weeks, you know, I had developed the habit of doing 15 to 20 minutes of exercise on YouTube, exercises that I can do on a chair or without having to get up too much (points upwards) you know. » P7 « Even «the PA counsellor" had told me, you know, when you go to the grocery store, park your car a bit farther. Well, that's what I do, you know, that's what I was doing because I thought, that makes sense, you know. » P8
	Absence of physical,	Time to completion is not enough for benefits Worsened pain	« No, no, I find that my pain is even stronger. » P3 « (Do you see any impact on your mental balance, your mood?) No. » P3

	psychosocial, and behavioral benefits and adverse events	No noticeable changes, at least not yet. Intention-to-behaviour gap; reference to behaviour remaining unchanged, not changing enough, or not being maintained.	« (Did you notice, since your participation in the intervention, are there any personal or social activities that have changed?)... No, not for right now. Because, yes, there are things I would like to change later, maybe. But not now. » P8 « Not yet, because I haven't fully implemented everything I've learned yet. » P1 « No, I didn't shorten the route. You know, during the time I was with «the PA counsellor" , I had extended the route, but now it has returned to its normal length. » P7 « So, you know, that's why I'm saying, and that's why I feel bad lately because, you know, I was on the right track. » P8
Recommendations for future	*Intervention*	Intervention should: Add psychological care Increase session length and pace across a longer timeframe, especially after surgery Offer exercise training sessions, possibly using an online platform (e.g., Zoom)	« So, it would be great if there were also psychological aspects involved. » P2 « But if, you know, there was someone with us who could do exercises with us, even over Zoom, or, how do I say that? Provide a workout routine or, I don't know, something like that. » P2 « Yes, exactly. More than just theory. » P4 « The only thing is, I would have liked it to be longer. » P2
	Research	Employ a variety of strategies to help participants successfully complete research tasks: support participants while performing assessments, increase communication frequency, provide comprehensive user-friendly schedule of activities/tasks, and offer more opportunities for participants to share their perspectives and consider adding open-ended questions.	« It's just that we could have had a little more support in filling out the forms and everything. » P2 « Well, it's about maybe having received that document, which is the famous program and all. » P4 « But otherwise, I found the questionnaires difficult. I think I would have preferred a questionnaire where I sit down and write things, rather than not satisfactory, completely agree, sometimes. I find it doesn't fit, that scale, with the question asked. » P7
	Non-specific	No suggestion	« Well, well, if we wanted to improve the intervention, would there be anything to change? (Participant 1 shakes their head indicating no) No? I see you shaking your head no. Well, I think they will be happy nonetheless. » P1

Table S3. Quality of life, depressive and anxiety symptoms during observational phases (A1 and A2), and interventional phase (B1)

Participants	Depressive symptoms				Anxiety symptoms				Physical composite summary*				Mental composite summary*			
	Phase A1		Phase B1	Phase A2	Phase A1		Phase B1	Phase A2	Phase A1		Phase B1	Phase A2	Phase A1		Phase B1	Phase A2
	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4
1 G1	2	3	2	2	0	0	0	0	80.6	82.5	88.8	90.0	77.4	79.3	84.0	79.6
2 G1	20	22	21	21	15	16	18	18	60.0	53.8	57.5	48.8	22.1	23.2	22.1	11.8
3 G1	4	2	7	2	2	2	1	0	31.3	23.8	21.9	56.9	57.8	77.4	60.0	79.0
4 G2	3	.	.	.	1	.	.	.	38.8	.	.	.	79.0	.	.	.
5 G2	2	4	3	1	13	17	18	0	38.8	39.8	62.5	75.6	56.5	39.3	77.2	73.0
6 G1	20	19	10	14	10	7	5	5	46.3	37.5	43.8	28.1	22.1	26.5	60.2	72.3
7 G2	4	3	2	2	8	7	1	3	51.9	70.6	75.0	61.9	50.2	68.7	81.4	72.6
8 G1	9	8	8	7	0	1	0	5	59.4	52.5	51.3	57.5	75.3	66.9	74.3	79.0
9 G1	3	3	3	3	0	0	0	0	81.3	78.1	84.4	84.4	80.9	80.9	76.8	83.4
10 G2	3	3	3	2	0	0	1	0	75.6	66.9	80.0	74.4	85.3	83.5	85.0	84.0
11 G2	10	15	11	9	11	9	7	8	63.1	51.9	45.6	47.5	20.9	20.7	34.3	32.5
12 G2	26	25	21	13	18	18	18	18	11.3	13.8	27.5	26.3	12.9	19.3	22.0	31.3
Total	**4 (9.5)**	**4 (14)**	**7 (7.5)**	**3 (9)**	**5 (11.5)**	**7 (12)**	**1 (18)**	**3 (6.5)**	**55.6 (27.5)**	**52.5 (30.3)**	**57.5 (32.8)**	**57.5 (26.9)**	**57.2 (55.7)**	**66.9 (53.5)**	**74.2 (32,1)**	**73 .0 (27.0)**

For depressive and anxiety symptoms: effective dose 50 (= 50% probability of feeling better compared to phase A1 (T1 and T2) is in green; Effective dose 25 (= 25% probability of feeling better) is in clear green. For quality of life (physical and mental component subscale: case in green reach minimal clinically important difference of compared to phase A1 (T1 and T2). The unweighted RAND-36 physical and mental component subscale ranged from 0 to 100, with higher scores indicating better quality of life. Total data are presented as median (IQR)

Table S4. Self-declared bodily pain during observational phases (A1 and A2), and interventional phase (B1)

Participants	Bodily pain intensity[a]				Bodily pain work interference[b]			
	Phase A1		Phase B1	Phase A2	Phase A1		Phase B1	Phase A2
	T1	T2	T3	T4	T1	T2	T3	T4
1 G1	3	2	1	1	2	1	1	1
2 G1	1	1	1	1	1	1	1	1
3 G1	5	5	5	5	3	3	4	4
4 G2	5	.	.	.	3	.	.	.
5 G2	4	5	2	4	3	4	1	2
6 G1	4	4	4	5	3	3	3	4
7 G2	5	3	2	3	4	2	1	2
8 G1	4	5	4	5	2	3	3	3
9 G1	3	2	2	4	1	2	2	2
10 G2	4	4	3	4	2	2	1	2
11 G2	3	2	3	4	2	2	2	3
12 G2	5	6	4	4	5	5	3	3
Total	**4 (2)**	**4 (3)**	**3 (2)**	**4 (1.3)**	**2.5 (1)**	**2 (1)**	**2 (2)**	**2 (1)**

Total data are presented as median (IQR)

[a]How much bodily pain have you had during the past 4 weeks? None 1 Very mild 2 Mild 3 Moderate 4 Severe 5 Very severe 6

[b]During the past 4 weeks, how much did pain interfere with your normal work (including both work outside the home and housework)? Not at all 1 A little bit 2 Moderately 3 Quite a bit 4 Extremely 5

Table S5. Self-declared physical activity and sitting time during observational phases (A1 and A2), and interventional phase (B1)

Participants	Self-declared MVPA (min/wk.)				Self-declared sitting time (h/d)				Self-declared leisure MVPA (min/wk.)				Self-declared travel MVPA (min/wk.)			
	Phase A1		Phase B1	Phase A2	Phase A1		Phase B1	Phase A2	Phase A1		Phase B1	Phase A2	Phase A1		Phase B1	Phase A2
	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4
1 G1	0	90	520	180	10.0	9.0	10.0	9,5	0.0	90	520	180	0.0	0.0	0.0	0.0
2 G1	0	0	0	0	14.0	14.0	14.0	14.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3 G1	900	600	600	920	13.0	5.0	3.5	2.5	0.0	0.0	0.0	10	0.0	0.0	0.0	10
4 G2	0	.	.	.	15,5	.	.	.	0.0	.	.	.	0.0	.	.	.
5 G2	1325	0	360	340	1.0	1.3	0.3	1.0	600	0.0	120	300	125	0.0	60	20
6 G1	135	90	120	80	15.0	15.0	14.0	13.0	135	90	120	80	0.0	0.0	0.0	0.0
7 G2	1160	1140	540	420	3.0	4.0	2,5	4.0	60	60	60	60	0.0	0.0	0.0	0.0
8 G1	2250	825	1545	1680	9.0	4.0	7.0	4.0	0.0	0.0	45	60	0.0	0.0	0.0	0.0
9 G1	150	330	140	90	4.5	5.0	4.0	4.5	0.0	105	140	90	150	0.0	0.0	0.0
10 G2	0	30	60	90	22.0	16.0	16.0	15.0	0.0	30	60	90	0.0	0.0	0.0	0.0
11 G2	0	90	0	90	9.5	10.5	10.0	18.0	0.0	0.0	0.0	90	0.0	90	0.0	0.0
12 G2	0	0	0	120	5.0	15.0	14.0	15.0	0.0	0.0	0.0	30	0.0	0.0	0.0	90
Total	67,5 (965)	90 (450)	250 (420)	120 (290)	9.8 (9.4)	9.0 (10.0)	10.0 (10.3)	9,5 (10.5)	0.0 (15.0)	0.0 (45.0)	60.0 (30.0)	80.0 (45.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (2.5)

Green cases are improvement of 30 min/wk. compared to phase A1 (T1 and T2). Total data are presented as median (IQR)

Table S6. Raw data: moderate-to-vigorous and light physical activity intensities, sedentary time, and steps number

case	phase	mt	Date	MVPA_min.d	SedTime_min.d	SedTime_h.d	LightPA_min.d	steps
1	A1	1	2021-10-11	13,33	491,83	8,20	172,83	3610
1	A1	2	2021-10-12	5,17	793,67	13,23	142,17	3724
1	A1	3	2021-10-13	5,50	720,83	12,01	106,67	3318
1	A1	4	2021-10-14	20,83	759,83	12,66	117,33	4366
1	A1	5	2021-10-15	10,67	727,17	12,12	141,17	5347
1	A1	6	2021-10-16	7,83	519,67	8,66	149,50	4067
1	A1	7	2021-10-17	16,50	600,67	10,01	136,83	3316
1	B	8	2021-11-08	19,17	745,50	12,43	116,50	5292
1	B	9	2021-11-09	5,50	809,00	13,48	128,50	3999
1	B	10	2021-11-10	8,17	836,50	13,94	136,33	4407
1	B	11	2021-11-11	15,83	828,83	13,81	120,33	4309
1	B	12	2021-11-12	5,00	818,17	13,64	94,83	2940
1	B	13	2021-11-13	4,83	774,83	12,91	176,33	5089
1	B	14	2021-11-14	4,00	712,17	11,87	132,83	2917
2	A1	1	2021-11-03	39,83	834,17	13,90	81,00	5330
2	A1	2	2021-11-04	5,00	822,00	13,70	118,00	2807
2	A1	3	2021-11-05	31,33	713,17	11,89	182,50	5657
2	A1	4	2021-11-06	38,67	590,83	9,85	276,50	10008
2	A1	5	2021-11-07	29,50	590,33	9,84	236,17	9050
2	A1	6	2021-11-08	13,83	874,00	14,57	123,17	2683
2	A1	7	2021-11-09	10,67	642,17	10,70	67,17	1778
2	B	8	2021-12-01	27,33	679,83	11,33	66,67	4357
2	B	9	2021-12-02	15,83	857,00	14,28	117,17	4411
2	B	10	2021-12-03	55,50	568,00	9,47	168,50	5281
2	B	11	2021-12-04	79,67	692,17	11,54	173,17	12347
2	B	12	2021-12-05	22,33	445,67	7,43	192,00	7635
2	B	13	2021-12-06	3,33	758,67	12,64	82,00	1975
2	B	14	2021-12-07	32,50	645,17	10,75	66,33	4780
2	A2	15	2021-12-22	61,67	591,67	9,86	186,83	7246
2	A2	16	2021-12-23	73,00	546,67	9,11	174,33	6013
2	A2	17	2021-12-24	95,83	715,00	11,92	158,17	11191
2	A2	18	2021-12-25	11,17	476,17	7,94	196,67	3701
2	A2	19	2021-12-26	54,17	342,00	5,70	165,83	7643
2	A2	20	2021-12-27					
2	A2	21	2021-12-28					
2	A2	22	2021-12-29					
2	A2	23	2021-12-30	40,50	476,50	7,94	204,00	5915
2	A2	24	2021-12-31	16,00	438,00	7,30	254,00	6610
3	A1	1	2021-11-01					
3	A1	2	2021-11-02					
3	A1	3	2021-11-03	12,00	548,00	9,13	179,00	5746
3	A1	4	2021-11-04	9,33	527,50	8,79	111,33	2187

3	A1	5	2021-11-05	19,17	592,33	9,87	263,00	6947
3	A1	6	2021-11-06	9,00	346,83	5,78	176,50	3231
3	A1	7	2021-11-07					
3	B	8	2021-11-30	5,50	685,50	11,43	90,83	2114
3	B	9	2021-12-01	5,17	479,67	7,99	132,83	2781
3	B	10	2021-12-02	3,83	433,00	7,22	97,67	2231
3	B	11	2021-12-03	6,33	784,50	13,08	119,50	2556
3	B	12	2021-12-04	9,83	320,33	5,34	236,83	6053
3	B	13	2021-12-05					
3	B	14	2021-12-06					
3	A2	15	2021-12-16	14,33	522,83	8,71	248,33	6973
3	A2	16	2021-12-17	9,00	458,50	7,64	257,33	6671
3	A2	17	2021-12-18					
3	A2	18	2021-12-19					
3	A2	19	2021-12-20	9,33	321,50	5,36	237,17	5992
3	A2	20	2021-12-21					
3	A2	21	2021-12-22	13,83	278,83	4,65	267,50	9266
3	A2	22	2021-12-23	12,17	288,33	4,81	273,67	7579
5	A1	1	2022-02-03	6,67	556,33	9,27	105,17	2307
5	A1	2	2022-02-04					
5	A1	3	2022-02-05	10,50	577,17	9,62	150,50	2763
5	A1	4	2022-02-06					
5	A1	5	2022-02-07	4,50	431,67	7,19	131,33	2483
5	A1	6	2022-02-08					
5	A1	7	2022-02-09	5,67	498,00	8,30	62,83	1357
5	A1	8	2022-02-10					
5	A1	9	2022-02-11					
5	A1	10	2022-02-12					
5	A1	11	2022-02-13					
5	A1	12	2022-02-14	4,33	385,00	6,42	234,17	4111
5	A1	13	2022-02-15					
5	A1	14	2022-02-16					
6	A1	1	2022-03-03					
6	A1	2	2022-03-04	11,00	605,83	10,10	166,17	2805
6	A1	3	2022-03-05	21,67	554,00	9,23	195,33	7113
6	A1	4	2022-03-06	8,00	660,83	11,01	199,17	2988
6	A1	5	2022-03-07	13,00	604,17	10,07	216,67	3770
6	A1	6	2022-03-08	19,50	630,83	10,51	120,83	2292
6	A1	7	2022-03-09	13,00	457,50	7,63	141,67	2104
6	B	8	2022-03-31	6,00	682,83	11,38	192,83	3278
6	B	9	2022-04-01	10,33	730,00	12,17	148,33	3376
6	B	10	2022-04-02	13,67	587,33	9,79	254,00	5929
6	B	11	2022-04-03	22,00	502,17	8,37	230,17	4842
6	B	12	2022-04-04					
6	B	13	2022-04-05	9,00	754,00	12,57	190,00	3671
6	B	14	2022-04-06	14,00	425,50	7,09	174,83	4860

8	A1	1	2022-03-14	19,83	737,50	12,29	235,83	6947
8	A1	2	2022-03-15	7,67	534,17	8,90	271,83	7452
8	A1	3	2022-03-16	28,50	506,17	8,44	303,83	9231
8	A1	4	2022-03-17	23,83	644,00	10,73	304,17	9215
8	A1	5	2022-03-18	39,00	685,33	11,42	276,33	7927
8	A1	6	2022-03-19	10,83	720,00	12,00	165,67	2593
8	A1	7	2022-03-20					
8	B	8	2022-04-14	84,00	428,67	7,14	309,50	12985
8	B	9	2022-04-15	1,17	788,17	13,14	36,67	642
8	B	10	2022-04-16	2,33	675,50	11,26	13,00	227
8	B	11	2022-04-17	2,83	706,33	11,77	98,50	2143
8	B	12	2022-04-18	3,67	605,33	10,09	55,83	1159
8	B	13	2022-04-19	29,33	610,50	10,18	241,50	8712
8	B	14	2022-04-20					
8	A2	15	2022-05-09	77,67	694,17	11,57	272,00	9149
8	A2	16	2022-05-10	13,33	631,83	10,53	277,00	8415
8	A2	17	2022-05-11	45,33	597,00	9,95	307,17	10019
8	A2	18	2022-05-12					
8	A2	19	2022-05-13	4,17	732,33	12,21	33,50	675
8	A2	20	2022-05-14	22,50	651,50	10,86	318,67	9304
8	A2	21	2022-05-15	47,83	653,50	10,89	235,17	7392
8	A2	22	2022-05-16	2,00	528,17	8,80	24,00	372
7	A1	1	2022-03-15	53,67	722,50	12,04	180,67	3373
7	A1	2	2022-03-16	14,17	583,67	9,73	209,83	4193
7	A1	3	2022-03-17	34,17	660,00	11,00	204,50	6628
7	A1	4	2022-03-18	47,83	557,00	9,28	185,83	8143
7	A1	5	2022-03-19					
7	A1	6	2022-03-20	7,33	497,00	8,28	110,83	2041
7	A1	7	2022-03-21	8,33	599,67	9,99	169,50	3158
7	A1	8	2022-03-22	51,17	547,83	9,13	116,50	2917
7	A1	9	2022-03-23	19,83	474,17	7,90	168,17	3460
7	A1	10	2022-03-24					
7	A1	11	2022-03-25	14,50	504,33	8,41	223,33	3869
7	A1	12	2022-03-26	7,17	491,67	8,19	176,50	3417
7	A1	13	2022-03-27	13,17	684,00	11,40	158,17	3159
7	A1	14	2022-03-28	11,17	586,17	9,77	165,50	3279
7	B	15	2022-04-20	5,17	480,33	8,01	231,17	3417
7	B	16	2022-04-21					
7	B	17	2022-04-22	8,17	625,33	10,42	204,00	3895
7	B	18	2022-04-23	5,00	459,83	7,66	234,67	4020
7	B	19	2022-04-24	19,17	331,50	5,53	256,00	5604
7	B	20	2022-04-25	11,00	496,83	8,28	224,50	3807
7	B	21	2022-04-26	9,00	461,83	7,70	118,67	2702
7	B	22	2022-04-27	49,83	612,17	10,20	136,67	2322
7	A2	23	2022-05-05	21,00	428,67	7,14	216,67	4245
7	A2	24	2022-05-06	16,17	514,33	8,57	285,67	5576

7	A2	25	2022-05-07					
7	A2	26	2022-05-08					
7	A2	27	2022-05-09	10,00	546,17	9,10	169,33	3205
7	A2	28	2022-05-10	14,33	444,50	7,41	125,50	3365
7	A2	29	2022-05-11	10,50	466,67	7,78	146,17	2985
7	A2	30	2022-05-12					
7	A2	31	2022-05-13	10,67	541,17	9,02	142,17	2947
7	A2	32	2022-05-14	15,50	592,50	9,88	180,00	3897
9	A1	1	2022-03-23	25,83	622,17	10,37	298,83	11488
9	A1	2	2022-03-24	29,67	482,50	8,04	309,83	10467
9	A1	3	2022-03-25	33,50	573,17	9,55	199,83	8093
9	A1	4	2022-03-26	14,17	695,00	11,58	174,33	3577
9	A1	5	2022-03-27	10,33	647,67	10,79	228,83	5638
9	A1	6	2022-03-28	20,33	495,00	8,25	327,33	9603
9	A1	7	2022-03-29	15,83	635,00	10,58	315,50	10101
10	A1	1	2022-03-30	21,83	701,67	11,69	77,67	3299
10	A1	2	2022-03-31	38,83	870,50	14,51	134,67	5238
10	A1	3	2022-04-01	13,50	702,83	11,71	69,33	1686
10	A1	4	2022-04-02	29,83	837,50	13,96	95,50	2775
10	A1	5	2022-04-03	53,33	637,50	10,63	137,50	4378
10	A1	6	2022-04-04	14,50	646,33	10,77	83,67	1883
10	A1	7	2022-04-05	22,50	834,17	13,90	134,17	4070
10	A1	8	2022-04-06					
10	A1	9	2022-04-07	11,67	836,50	13,94	74,00	1406
10	A1	10	2022-04-08					
10	A1	11	2022-04-09	26,17	591,33	9,86	166,00	4683
10	A1	12	2022-04-10					
10	A1	13	2022-04-11					
10	A1	14	2022-04-12	17,17	658,33	10,97	111,17	3191
10	B	15	2022-05-04	24,00	899,17	14,99	134,17	3657
10	B	16	2022-05-05	46,00	855,50	14,26	95,67	3929
10	B	17	2022-05-06	57,33	806,33	13,44	127,17	7534
10	B	18	2022-05-07	18,00	637,00	10,62	132,50	3367
10	B	19	2022-05-08	40,33	627,83	10,46	96,17	3616
10	B	20	2022-05-09	16,50	872,00	14,53	97,83	2659
10	B	21	2022-05-10	8,67	679,00	11,32	74,83	1736
11	A1	1	2022-05-18	12,17	669,00	11,15	103,00	2333
11	A1	2	2022-05-19	30,83	763,17	12,72	166,00	3491
11	A1	3	2022-05-20	33,83	752,00	12,53	185,17	4104
11	A1	4	2022-05-21	13,67	774,17	12,90	172,17	4428
11	A1	5	2022-05-22	8,50	747,17	12,45	89,33	1549
11	A1	6	2022-05-23	15,83	614,00	10,23	209,00	5367
11	A1	7	2022-05-24	9,83	790,33	13,17	208,83	4087
11	A1	8	2022-05-25	14,67	752,83	12,55	123,50	3040
11	A1	9	2022-05-26	9,17	945,50	15,76	136,33	2682
11	A1	10	2022-05-27	15,67	791,33	13,19	140,00	3538

11	A1	11	2022-05-28	17,17	598,33	9,97	309,50	5943
11	A1	12	2022-05-29	10,50	752,50	12,54	114,00	2583
11	A1	13	2022-05-30	7,50	906,67	15,11	119,83	2400
11	A1	14	2022-05-31	12,83	593,17	9,89	162,00	4515
11	B	15	2022-06-22	14,50	423,50	7,06	118,83	3130
11	B	16	2022-06-23	16,67	631,33	10,52	114,83	3469
11	B	17	2022-06-24	11,17	975,33	16,26	89,50	1877
11	B	18	2022-06-25	9,17	867,00	14,45	85,83	2115
11	B	19	2022-06-26	10,67	904,00	15,07	77,33	1942
11	B	20	2022-06-27					
11	B	21	2022-06-28	15,00	513,83	8,56	135,17	3120
11	A2	22	2022-08-20	26,17	804,50	13,41	125,33	5356
11	A2	23	2022-08-21	22,33	692,17	11,54	231,50	5273
11	A2	24	2022-08-22	24,83	640,83	10,68	145,33	4633
11	A2	25	2022-08-23	14,83	715,50	11,93	139,67	3862
11	A2	26	2022-08-24	17,33	753,83	12,56	168,83	3028
11	A2	27	2022-08-25	17,17	566,00	9,43	136,83	2429
11	A2	28	2022-08-26					
12	A1	1	2022-08-04	7,17	507,83	8,46	158,00	4517
12	A1	2	2022-08-05	6,50	626,67	10,44	114,83	1778
12	A1	3	2022-08-06	3,67	781,00	13,02	62,33	622
12	A1	4	2022-08-07					
12	A1	5	2022-08-08	5,50	733,50	12,23	99,00	2359
12	A1	6	2022-08-09	18,00	930,67	15,51	122,33	3576
12	A1	7	2022-08-10	3,50	770,83	12,85	122,67	1945
12	A1	8	2022-08-11	3,83	697,00	11,62	91,67	1053
12	A1	9	2022-08-12	3,67	669,67	11,16	74,67	746
12	A1	10	2022-08-13	3,00	768,17	12,80	70,83	1014
12	A1	11	2022-08-14	5,17	978,83	16,31	96,00	921
12	A1	12	2022-08-15	2,17	624,00	10,40	86,83	1492
12	A1	13	2022-08-16	6,50	813,17	13,55	89,33	1414
12	A1	14	2022-08-17	3,50	480,67	8,01	53,83	466
12	B	15	2022-09-09	2,17	794,17	13,24	42,67	551
12	B	16	2022-09-10	3,17	800,33	13,34	35,50	467
12	B	17	2022-09-11	2,50	794,00	13,23	42,50	534
12	B	18	2022-09-12	5,00	785,33	13,09	48,67	1193
12	B	19	2022-09-13	1,00	663,00	11,05	51,00	469
12	B	20	2022-09-14	3,17	743,83	12,40	85,67	1284
12	B	21	2022-09-15	2,17	795,50	13,26	41,33	470
12	A2	22	2022-10-06	5,17	644,67	10,74	57,67	1430
12	A2	23	2022-10-07	11,33	597,17	9,95	86,50	2922
12	A2	24	2022-10-08	2,83	663,50	11,06	100,67	1215
12	A2	25	2022-10-09	7,83	714,17	11,90	136,00	3178
12	A2	26	2022-10-10	6,83	640,33	10,67	83,83	1838
12	A2	27	2022-10-11	3,50	701,33	11,69	57,17	965
12	A2	28	2022-10-12	11,50	845,17	14,09	112,33	4446

Supplemental files. Individual data

PARTICIPANT 1

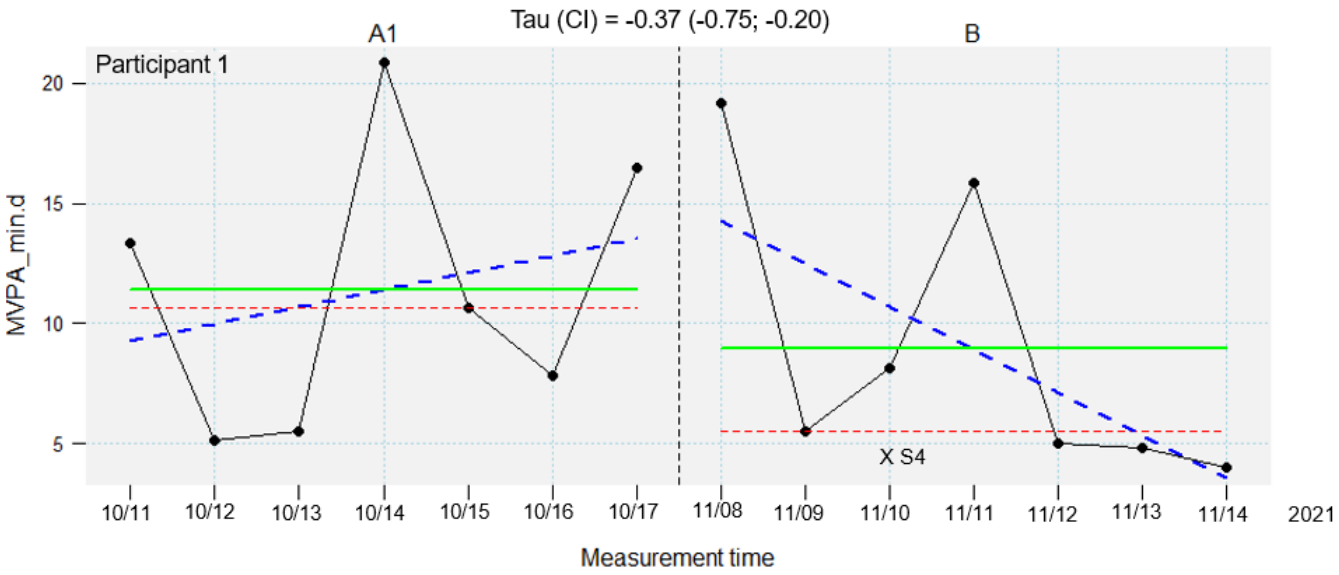
Characteristics

Participant	Age (years)	Sex	Marital status	Number of children	Professional status	Level of education	Income ($)	Ethnicity	BMI (k.m²)	Medical conditions	Smoking status / Alcohol consumption score
1	56	F	Married	3	Full-time	Pre-University	50,000-74,999	White	44.39	HTN, Dys, OSA	Former smoker / 1

Feasibility and acceptability outcomes

Participants	Counseling sessions					Research methods			
	Number of sessions completed	Duration of sessions (min)	Attrition (Y/N)	Acceptability anticipated sore	Acceptability retrospective score	Number of online surveys completed [% missing data in completed survey]	Interviews completed (Y/N)	Number of accelerometer wear days: phases A1; B; A2	Number of days with valid accelerometer wear time (9h/d): phases A1; B; A2
1	5	36.0 (29.5-46.5)	N	3,4	3.5	4 [0%]	N	7; 7; 0	7; 7; 0

Accelerometer data



Dashed blue line = trend, red line = median, green line = mean
No phase A2 = have had bariatric surgery before session 6 of the intervention

Generalization Measures

Participant	Depressive symptoms				Anxiety symptoms				Physical composite summary*				Mental composite summary*			
	Phase A		Phase B		Phase A		Phase B		Phase A		Phase B		Phase A		Phase B	
	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4
1	2	3	2	2	0	0	0	0	80.6	82.5	88.8	90.0	77.4	79.3	84.0	79.6

Participant	Self-declared MVPA (min/wk.)				Self-declared sitting time (h/d)				Self-declared leisure MVPA (min/wk.)				Self-declared travel MVPA (min/wk.)			
	Phase A		Phase B		Phase A		Phase B		Phase A		Phase B		Phase A		Phase B	
	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4
1	0	90	520	180	10.0	9.0	10.0	9,5	0	90	520	180	0	0	0	0

Perceived benefits
No interview = have had bariatric surgery before session 6 of the intervention

Life events or factors that occurred during the study period
Nothing in particular according to intervention notes

PARTICIPANT 2

Characteristics

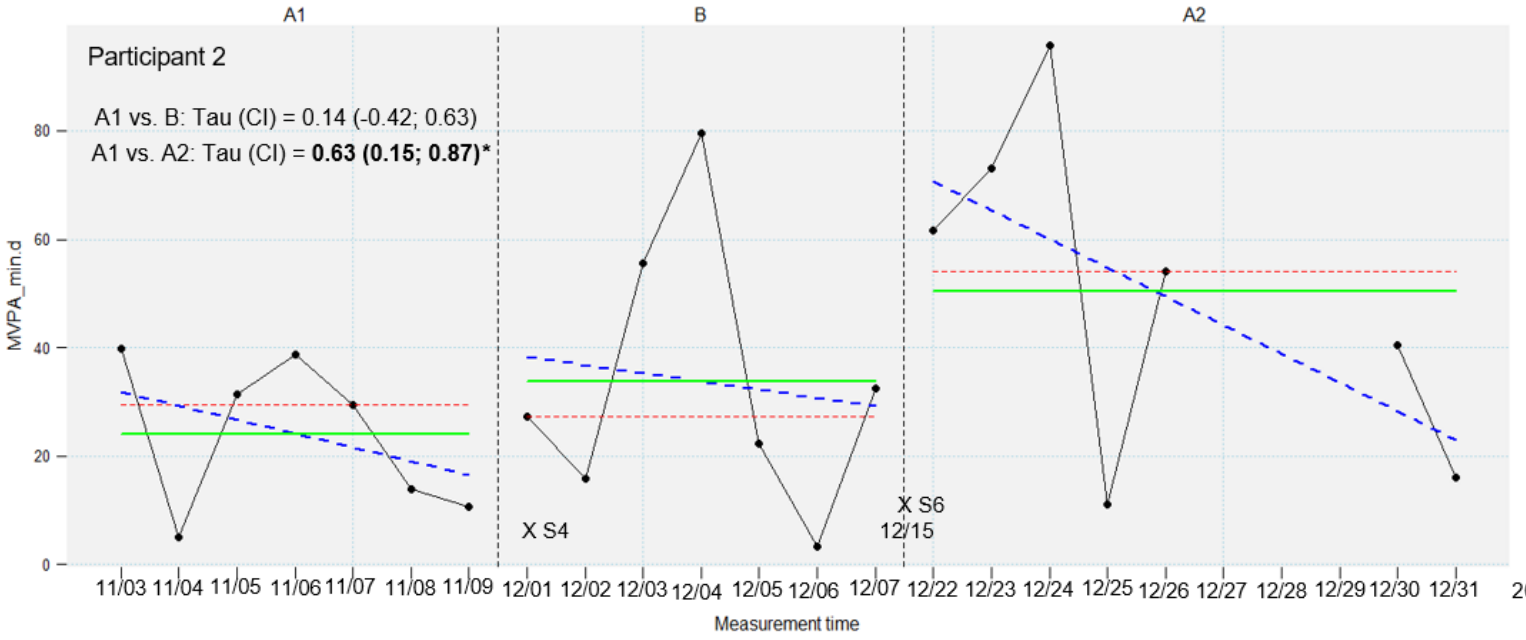
Participants	Age (years)	Sex	Marital status	Number of children	Professional status	Level of education	Income ($)	Ethnicity	BMI (k.m²)	Medical conditions	Smoking status / Alcohol consumption score
2	46	F	Civil union	4	Full-time	University	75,000-100,000	White	41.99	HTN, Dys, T2D, OSA, RA, MH, Derma	Non-smoker / 0

Feasibility and acceptability outcomes

Participants	Counseling sessions					Research methods			
	Number of sessions completed	Duration of sessions (min)	Attrition (Y/N)	Acceptability anticipated sore	Acceptability retrospective score	Number of online surveys completed [% missing data in completed survey]	Interviews completed (Y/N)	Number of accelerometer wear days: phases A1; B; A2	Number of days with valid accelerometer wear time (9h/d): phases A1; B; A2
2	6	41.5 (35.3-49.5)	N	3,1	2.9	4 [0%]	Y	7; 7; 7*	7; 7; 7

* not on consecutive days

Accelerometer data



Dashed blue line = trend, red line = median, green line = mean

Generalization Measures

Participant	Depressive symptoms								Anxiety symptoms							
	Phase A				Phase B				Phase A				Phase B			
	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4
2	20	22	21	21	15	16	18	18	60.0	53.8	57.5	48.8	22.1	23.2	22.1	11.8

Participant	Self-declared MVPA (min/wk.)								Self-declared sitting time (h/d)							
	Phase A				Phase B				Phase A				Phase B			
	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4
2	0	0	0	0	14.0	14.0	14.0	14.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Participant	Self-declared leisure MVPA (min/wk.)								Self-declared travel MVPA (min/wk.)							
	Phase A				Phase B				Phase A				Phase B			
	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4
2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Perceived benefits

- Didn't fully implement the desired changes yet.
- No social impact in the COVID context.
- Moves more alone and with the family.
- Improvement of mental and well-being.
- Learned new things and changed their perceptions about physical activity.
- Started organizing their basement to move more.

Life events or factors that occurred during the study period

During phase B, the participant received a preoccupying medical result. She had to get an operation before her bariatric surgery because of a tumor in her intestine.

PARTICIPANT 3

Characteristics

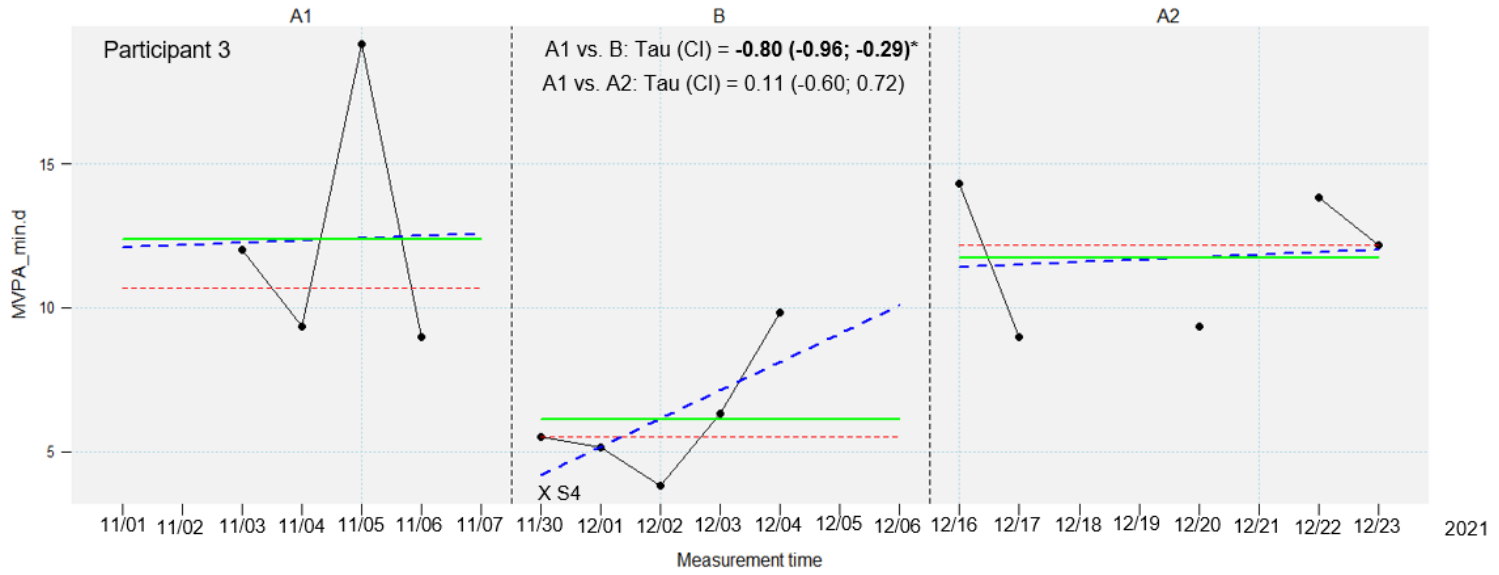
Participants	Age (years)	Sex	Marital status	Number of children	Professional status	Level of education	Income ($)	Ethnicity	BMI (k.m²)	Medical conditions	Smoking status / Alcohol consumption score
3	50	F	Separated	2	Full-time	University	75,000-100,000	White	46.07	T2D, OSA, RA, RespiD	Non-smoker / 2

Feasibility and acceptability outcomes

	Counseling sessions					Research methods			
Participants	Number of sessions completed	Duration of sessions (min)	Attrition (Y/N)	Acceptability anticipated sore	Acceptability retrospective score	Number of online surveys completed [% missing data in completed survey]	Interviews completed (Y/N)	Number of accelerometer wear days: phases A1; B; A2	Number of days with valid accelerometer wear time (9h/d): phases A1; B; A2
3	6	40.5 (34.3-46.3)	N	2.7	2.9	4 [only medication]	N	5; 6; 6*	4; 5; 5

* not on consecutive days

Accelerometer data



Dashed blue line = trend, red line = median, green line = mean

Generalization Measures

Participant	Depressive symptoms								Anxiety symptoms								Physical composite summary*								Mental composite summary*							
	Phase A				Phase B				Phase A				Phase B				Phase A				Phase B				Phase A				Phase B			
	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4
3	4	2	7	2	2	2	1	0	31.3	23.8	21.9	56.9	57.8	77.4	60.0	79.0																

Participant	Self-declared MVPA (min/wk.)								Self-declared sitting time (h/d)								Self-declared leisure MVPA (min/wk.)								Self-declared travel MVPA (min/wk.)							
	Phase A				Phase B				Phase A				Phase B				Phase A				Phase B				Phase A				Phase B			
	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4
3	900	600	600	920					13.0	5.0	3.5	2.5					0.0	0.0	0.0	10					0.0	0.0	0.0	10				

Perceived benefits
No interview

Life events or factors that occurred during the study period
Nothing in particular according to intervention notes

PARTICIPANT 4

Characteristics

Participants	Age (years)	Sex	Marital status	Number of children	Professional status	Level of education	Income ($)	Ethnicity	BMI (k.m²)	Medical conditions	Smoking status / Alcohol consumption score
4	51	F	Married	0	Full-time	High school	>100,000	White	48.15	HTN, OSA, RA, MH	Former smoker / 0

Feasibility and acceptability outcomes

	Counseling sessions					Research methods			
Participants	Number of sessions completed	Duration of sessions (min)	Attrition (Y/N)	Acceptability anticipated sore	Acceptability retrospective score	Number of online surveys completed [% missing data in completed survey]	Interviews completed (Y/N)	Number of accelerometer wear days: phases A1; B; A2	Number of days with valid accelerometer wear time (9h/d): phases A1; B; A2
4	Did not receive the allocated intervention			-	-	1 [0%]	N	4; -	1; -

Withdraw the study because disliked wearing the accelerometer

Accelerometer data: Not extracted only phase A1

Generalization Measures

Participant	Depressive symptoms								Anxiety symptoms							
	Phase A				Phase B				Phase A				Phase B			
	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4
4	3	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.

Participant	Physical composite summary*								Mental composite summary*							
	Phase A				Phase B				Phase A				Phase B			
	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4
4	38.8	.	.	.	.	.	.	.	79.0	.	.	.	.	.	.	.

Participant	Self-declared MVPA (min/wk.)								Self-declared sitting time (h/d)							
	Phase A				Phase B				Phase A				Phase B			
	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4
4	0	.	.	.	.	.	.	.	15,5	.	.	.	.	.	.	.

Participant	Self-declared leisure MVPA (min/wk.)								Self-declared travel MVPA (min/wk.)							
	Phase A				Phase B				Phase A				Phase B			
	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4
4	0.0	.	.	.	.	.	.	.	0.0	.	.	.	.	.	.	.

PARTICIPANT 5

Characteristics

Participants	Age (years)	Sex	Marital status	Number of children	Professional status	Level of education	Income ($)	Ethnicity	BMI (k.m²)	Medical conditions	Smoking status / Alcohol consumption score
5	44	F	Civil union	3	Unemployed	High school	<25,000	White	53.63	HTN, T2D, RA	Non-smoker / 0

Feasibility and acceptability outcomes

	Counseling sessions					Research methods			
Participants	Number of sessions completed	Duration of sessions (min)	Attrition (Y/N)	Acceptability anticipated sore	Acceptability retrospective score	Number of online surveys completed [% missing data in completed survey]	Interviews completed (Y/N)	Number of accelerometer wear days: phases A1; B; A2	Number of days with valid accelerometer wear time (9h/d): phases A1; B; A2
5	6	42.0 (35.0-45.5)	N	3,3	3.0	4[0%]	Y	13*; 0; 0	5; 0; 0

* not on consecutive days

Accelerometer data: Not extracted only phase A1

Generalization Measures

Participant	Depressive symptoms				Anxiety symptoms				Physical composite summary*				Mental composite summary*			
	Phase A		Phase B		Phase A		Phase B		Phase A		Phase B		Phase A		Phase B	
	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4
5	2	4	3	1	13	17	18	0	38.8	39.8	62.5	75.6	56.5	39.3	77.2	73.0

Participant	Self-declared MVPA (min/wk.)				Self-declared sitting time (h/d)				Self-declared leisure MVPA (min/wk.)				Self-declared travel MVPA (min/wk.)			
	Phase A		Phase B		Phase A		Phase B		Phase A		Phase B		Phase A		Phase B	
	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4
5	1325	0	360	340	1.0	1.3	0.3	1.0	600	0.0	120	300	125	0.0	60	20

Perceived benefits

- No effect mentally and socially.
- During the intervention, walked more (movement for a particular purpose).
- Changed their physical activity.

Life events or factors that occurred during the study period
Major anemia and wrist surgery during phase B

PARTICIPANT 6

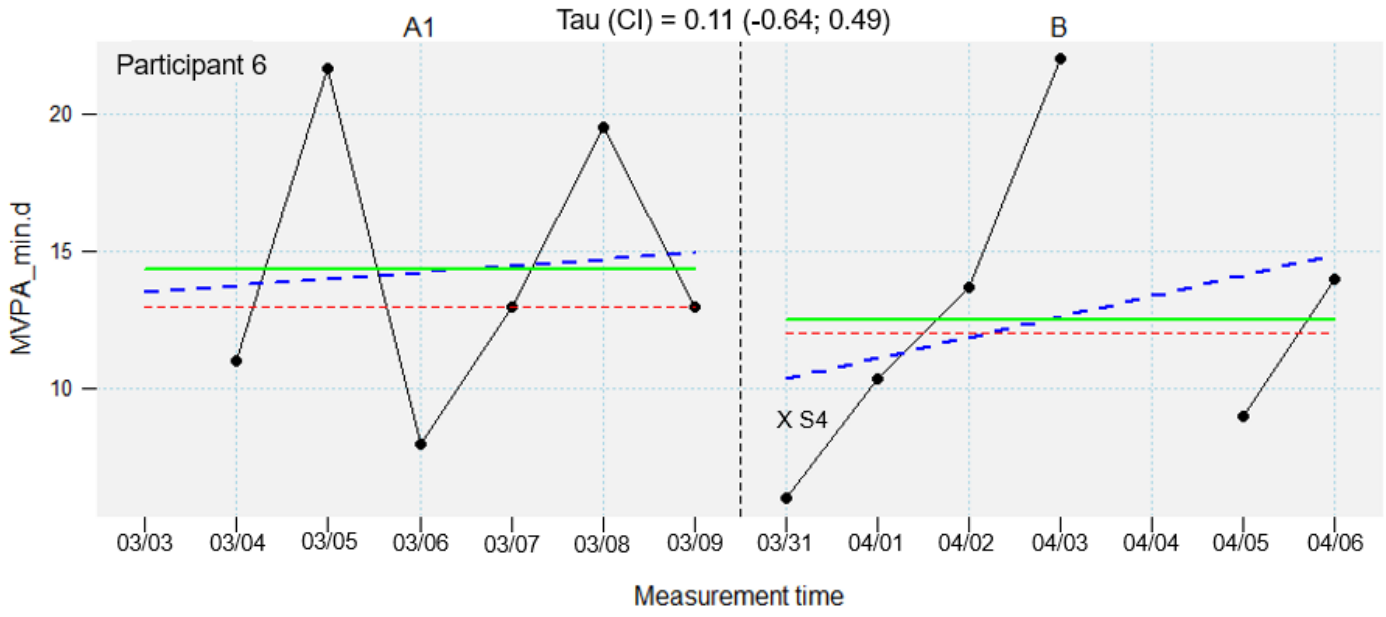
Characteristics

Participants	Age (years)	Sex	Marital status	Number of children	Professional status	Level of education	Income ($)	Ethnicity	BMI (k.m²)	Medical conditions	Smoking status / Alcohol consumption score
6	56	F	Married	3	Part-time	Pre-University	75,000-100,000	White	45.98	T2D, OSA, RA, CVD, RespiD, MH	Former smoker / 1

Feasibility and acceptability outcomes

Participants	Counseling sessions					Research methods			
	Number of sessions completed	Duration of sessions (min)	Attrition (Y/N)	Acceptability anticipated sore	Acceptability retrospective score	Number of online surveys completed [% missing data in completed survey]	Interviews completed (Y/N)	Number of accelerometer wear days: phases A1; B; A2	Number of days with valid accelerometer wear time (9h/d): phases A1; B; A2
6	6	49.0 (45-55.5)	N	3,5	3.4	4[0%]	Y	7; 7; 0	6; 6; 0

Accelerometer data



Dashed blue line = trend, red line = median, green line = mean

Generalization Measures

Participant	Depressive symptoms				Anxiety symptoms				Physical composite summary*				Mental composite summary*			
	Phase A		Phase B		Phase A		Phase B		Phase A		Phase B		Phase A		Phase B	
	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4
6	20	19	10	14	10	7	5	5	46.3	37.5	43.8	28.1	22.1	26.5	60.2	72.3

Participant	Self-declared MVPA (min/wk.)				Self-declared sitting time (h/d)				Self-declared leisure MVPA (min/wk.)				Self-declared travel MVPA (min/wk.)			
	Phase A		Phase B		Phase A		Phase B		Phase A		Phase B		Phase A		Phase B	
	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4
6	135	90	120	80	15.0	15.0	14.0	13.0	135	90	120	80	0.0	0.0	0.0	0.0

Perceived benefits

- No improvement of pain.
- Walks more and moves indoors during bad weather.
- Moves more regularly.
- Increased well-being and mood.

Life events or factors that occurred during the study period

Nothing in particular

PARTICIPANT 7

Characteristics

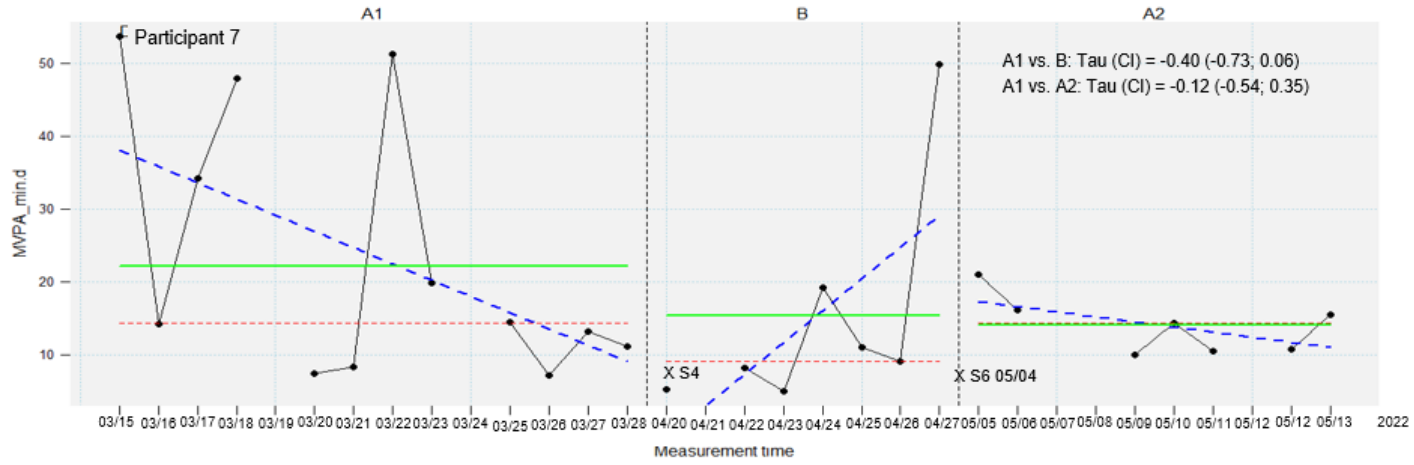
Participants	Age (years)	Sex	Marital status	Number of children	Professional status	Level of education	Income ($)	Ethnicity	BMI (k.m²)	Medical conditions	Smoking status / Alcohol consumption score
7	59	F	Single	0	Retired	University	25 000-49 999	White	54.81	HTN, Dys, T2D, OSA, RespiD, Derma	Former smoker / 3

Feasibility and acceptability outcomes

Participants	Counseling sessions					Research methods			
	Number of sessions completed	Duration of sessions (min)	Attrition (Y/N)	Acceptability anticipated sore	Acceptability retrospective score	Number of online surveys completed [% missing data in completed survey]	Interviews completed (Y/N)	Number of accelerometer wear days: phases A1; B; A2	Number of days with valid accelerometer wear time (9h/d): phases A1; B; A2
7	6	45.0 (41.3-49.8)	N	2,1	3.0	4[0%]	Y	14; 7*; 9*	12; 7; 7

* not on consecutive days

Accelerometer data



Dashed blue line = trend, red line = median, green line = mean

Generalization Measures

Participant	Depressive symptoms				Anxiety symptoms				Physical composite summary*				Mental composite summary*			
	Phase A		Phase B		Phase A		Phase B		Phase A		Phase B		Phase A		Phase B	
	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4
7	4	3	2	2	8	7	1	3	51.9	70.6	75.0	61.9	50.2	68.7	81.4	72.6

Participant	Self-declared MVPA (min/wk.)				Self-declared sitting time (h/d)				Self-declared leisure MVPA (min/wk.)				Self-declared travel MVPA (min/wk.)			
	Phase A		Phase B		Phase A		Phase B		Phase A		Phase B		Phase A		Phase B	
	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4
7	1160	1140	540	420	3.0	4.0	2,5	4.0	60	60	60	60	0.0	0.0	0.0	0.0

Perceived benefits

- No change in daily activities following the intervention.
- Still needs to make changes regarding physical activity.
- Did not continue aquagym classes due to snow.
- Participated in aquagym classes during the intervention.
- Engages in physical activity through household chores.
- Developed a habit of thinking about moving more.

Life events or factors that occurred during the study period

During phase A1, house renovation
During phase B, COVID

PARTICIPANT 8

Characteristics

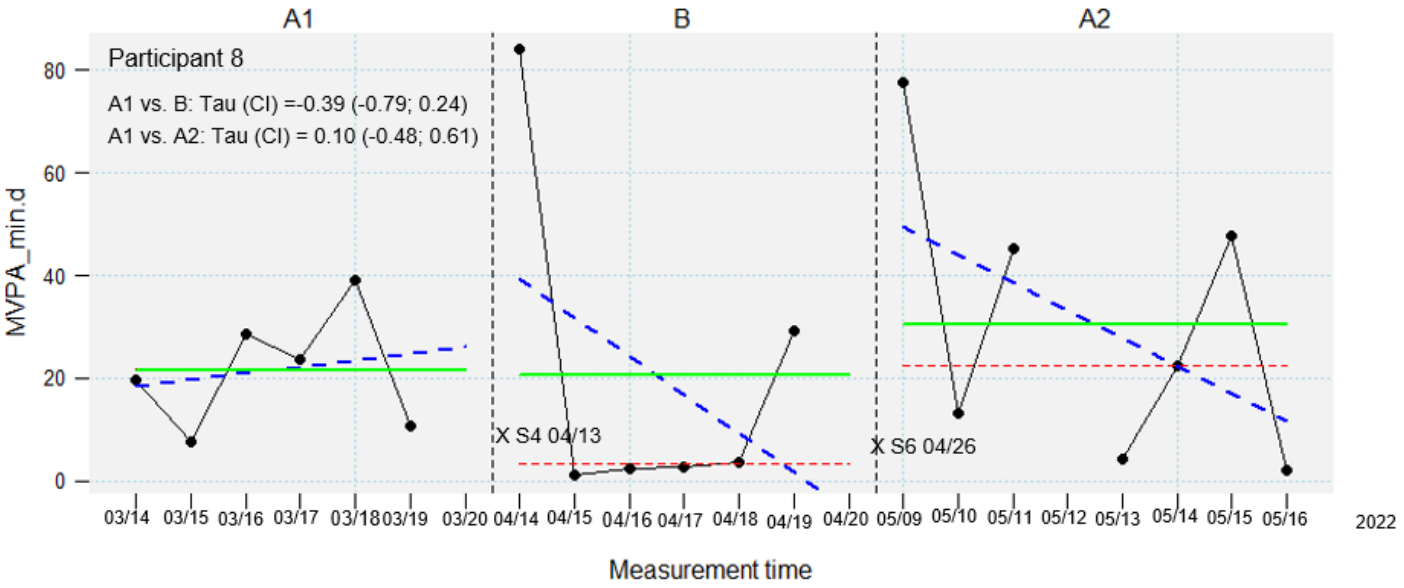
Participants	Age (years)	Sex	Marital status	Number of children	Professional status	Level of education	Income ($)	Ethnicity	BMI (k.m²)	Medical conditions	Smoking status / Alcohol consumption score
8	46	H	Single	0	Full-time	High school	50,000-74,999	White	54.36	Dys, OSA, CVD, MH	Non-smoker / 0

Feasibility and acceptability outcomes

Participants	Counseling sessions					Research methods			
	Number of sessions completed	Duration of sessions (min)	Attrition (Y/N)	Acceptability anticipated sore	Acceptability retrospective score	Number of online surveys completed [% missing data in completed survey]	Interviews completed (Y/N)	Number of accelerometer wear days: phases A1; B; A2	Number of days with valid accelerometer wear time (9h/d): phases A1; B; A2
8	6	45.5 (44.3-47.8)	N	3,0	3.1	4[0%]	Y	7; 7; 7*	6; 6; 7

* not on consecutive days

Accelerometer data



Dashed blue line = trend, red line = median, green line = mean

Generalization Measures

Participant	Depressive symptoms				Anxiety symptoms				Physical composite summary*				Mental composite summary*			
	Phase A		Phase B		Phase A		Phase B		Phase A		Phase B		Phase A		Phase B	
	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4
8	9	8	8	7	0	1	0	5	59.4	52.5	51.3	57.5	75.3	66.9	74.3	79.0

Participant	Self-declared MVPA (min/wk.)				Self-declared sitting time (h/d)				Self-declared leisure MVPA (min/wk.)				Self-declared travel MVPA (min/wk.)			
	Phase A		Phase B		Phase A		Phase B		Phase A		Phase B		Phase A		Phase B	
	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4
8	2250	825	1545	1680	9.0	4.0	7.0	4.0	0.0	0.0	45	60	0.0	0.0	0.0	0.0

Perceived benefits

- Values their ambition to move more and to take care of themselves.
- Moves more (walking + chair exercises).
- Successfully maintained changes.
- Improved mood and desire to socialize.
- Tries to find solutions to overcome barriers (joint pain).

Life events or factors that occurred during the study period

Nothing in particular

PARTICIPANT 9

Characteristics

Participants	Age (years)	Sex	Marital status	Number of children	Professional status	Level of education	Income ($)	Ethnicity	BMI (k.m²)	Medical conditions	Smoking status / Alcohol consumption score
9	62	F	Married	2	Full-time	High school	>100,000	White	35.00	HTN, OSA	Non-smoker / 2

Feasibility and acceptability outcomes

	Counseling sessions					Research methods			
Participants	Number of sessions completed	Duration of sessions (min)	Attrition (Y/N)	Acceptability anticipated sore	Acceptability retrospective score	Number of online surveys completed [% missing data in completed survey]	Interviews completed (Y/N)	Number of accelerometer wear days: phases A1; B; A2	Number of days with valid accelerometer wear time (9h/d): phases A1; B; A2
9	6	34.0 (26.0-45.0)	N	3,5	3.0	4[0%]	N	7; 0; 0	7; 0; 0

Accelerometer data = Not extracted only phase A1

Generalization Measures

Participant	Depressive symptoms				Anxiety symptoms				Physical composite summary*				Mental composite summary*			
	Phase A		Phase B		Phase A		Phase B		Phase A		Phase B		Phase A		Phase B	
	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4
9	3	3	3	3	0	0	0	0	81.3	78.1	84.4	84.4	80.9	80.9	76.8	83.4

Participant	Self-declared MVPA (min/wk.)				Self-declared sitting time (h/d)				Self-declared leisure MVPA (min/wk.)				Self-declared travel MVPA (min/wk.)			
	Phase A		Phase B		Phase A		Phase B		Phase A		Phase B		Phase A		Phase B	
	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4
9	150	330	140	90	4.5	5.0	4.0	4.5	0.0	105	140	90	150	0.0	0.0	0.0

Perceived benefits
No interview

Life events or factors that occurred during the study period
Nothing in particular according to intervention notes

PARTICIPANT 10

Characteristics

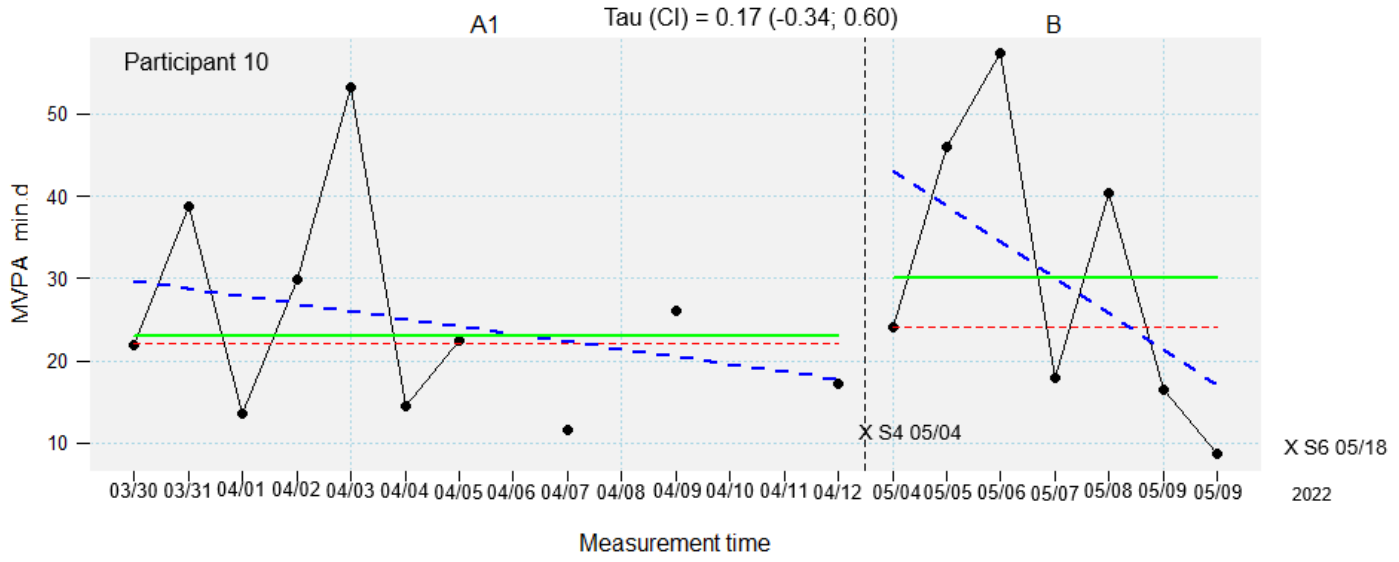
Participants	Age (years)	Sex	Marital status	Number of children	Professional status	Level of education	Income ($)	Ethnicity	BMI (k.m²)	Medical conditions	Smoking status / Alcohol consumption score
10	61	F	Divorced	2	Full-time	University	>100,000	White	51.22	OSA, RA	Former smoker / 2

Feasibility and acceptability outcomes

	Counseling sessions					Research methods			
Participants	Number of sessions completed	Duration of sessions (min)	Attrition (Y/N)	Acceptability anticipated sore	Acceptability retrospective score	Number of online surveys completed [% missing data in completed survey]	Interviews completed (Y/N)	Number of accelerometer wear days: phases A1; B; A2	Number of days with valid accelerometer wear time (9h/d): phases A1; B; A2
10	6	47.5 (43.8-52.0)	N	2,5	2.9	4[0%]	Y	11*; 7; 0	10; 7; 0

* not on consecutive days

Accelerometer data



Dashed blue line = trend, red line = median, green line = mean

Generalization Measures

Participant	Depressive symptoms				Anxiety symptoms				Physical composite summary*				Mental composite summary*			
	Phase A		Phase B		Phase A		Phase B		Phase A		Phase B		Phase A		Phase B	
	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4
10	3	3	3	2	0	0	1	0	75.6	66.9	80.0	74.4	85.3	83.5	85.0	84.0

Participant	Self-declared MVPA (min/wk.)				Self-declared sitting time (h/d)				Self-declared leisure MVPA (min/wk.)				Self-declared travel MVPA (min/wk.)			
	Phase A		Phase B		Phase A		Phase B		Phase A		Phase B		Phase A		Phase B	
	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4
10	0	30	60	90	22.0	16.0	16.0	15.0	0.0	30	60	90	0.0	0.0	0.0	0.0

Perceived benefits

- Habit changes not sustained due to COVID, heat, workload, lack of enjoyment, becoming a caregiver, and joint pain.

- No additional social support after the intervention.

- During the intervention: increased walking distance and step count, exercises on YouTube, less out of breath, pride, well-being, setting more realistic goals, and rearranging the house for exercise.

- After the intervention, mowed the lawn all summer instead of hiring someone.

- Desire to start moving again when less busy.

Life events or factors that occurred during the study period

During phase A2 had COVID

PARTICIPANT 11

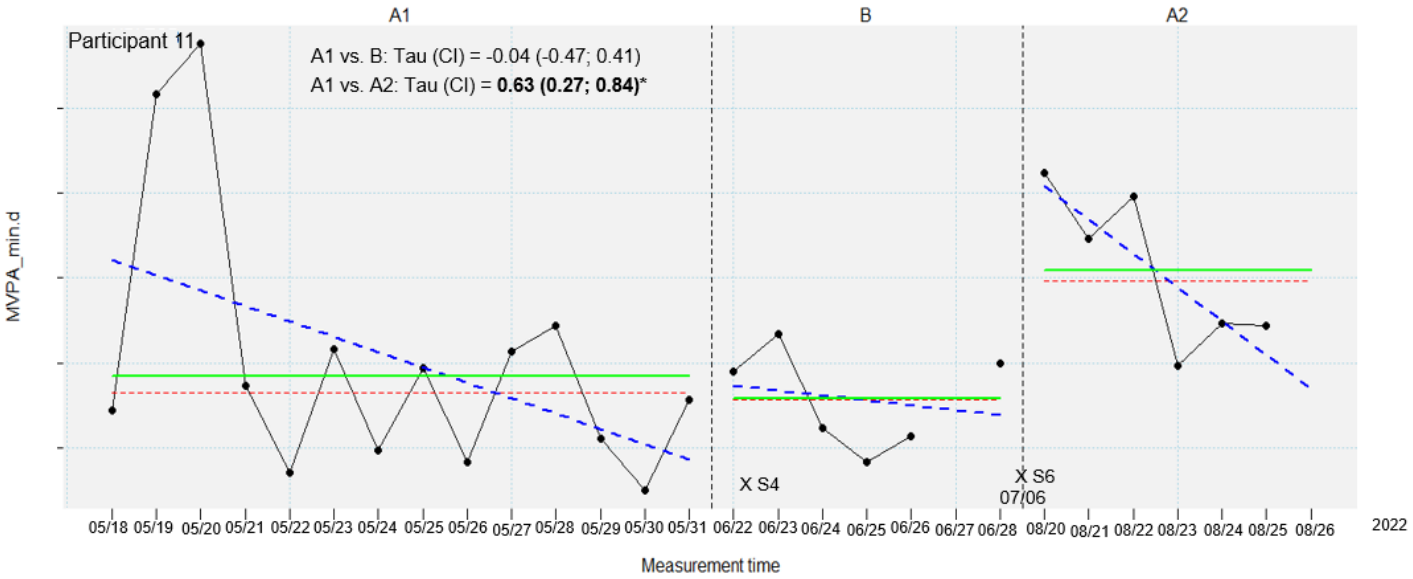
Characteristics

Participants	Age (years)	Sex	Marital status	Number of children	Professional status	Level of education	Income ($)	Ethnicity	BMI (k.m²)	Medical conditions	Smoking status / Alcohol consumption score
11	43	F	Married	3	Medical leave	Pre-University	75,000-100,000	White	44.86	HTN, OSA, RA, RespiD, MH	Former smoker / 3

Feasibility and acceptability outcomes

	Counseling sessions					Research methods			
Participants	Number of sessions completed	Duration of sessions (min)	Attrition (Y/N)	Acceptability anticipated sore	Acceptability retrospective score	Number of online surveys completed [% missing data in completed survey]	Interviews completed (Y/N)	Number of accelerometer wear days: phases A1; B; A2	Number of days with valid accelerometer wear time (9h/d): phases A1; B; A2
11	6	47.0 (44.3-50.5)	N	3,2	2.9	4[0%]	Y	14; 7; 7	14; 6; 6

Accelerometer data



Dashed blue line = trend, red line = median, green line = mean

Generalization Measures

Participant	Depressive symptoms								Anxiety symptoms							
	Phase A				Phase B				Phase A				Phase B			
	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4
11	10	15	11	9	11	9	7	8	63.1	51.9	45.6	47.5	20.9	20.7	34.3	32.5

Participant	Physical composite summary*								Mental composite summary*							
	Phase A				Phase B				Phase A				Phase B			
	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4
11	0	90	0	90	9.5	10.5	10.0	18.0	0.0	0.0	0.0	90	0.0	90	0.0	0.0

Participant	Self-declared MVPA (min/wk.)								Self-declared sitting time (h/d)							
	Phase A				Phase B				Phase A				Phase B			
	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4
11	0	90	0	90	9.5	10.5	10.0	18.0	0.0	0.0	0.0	90	0.0	90	0.0	0.0

Participant	Self-declared leisure MVPA (min/wk.)								Self-declared travel MVPA (min/wk.)							
	Phase A				Phase B				Phase A				Phase B			
	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4
11	0	90	0	90	9.5	10.5	10.0	18.0	0.0	0.0	0.0	90	0.0	90	0.0	0.0

Perceived benefits

- Some changes (increasing walking time) still need to be made but cause too much joint pain.
- Walks more and moves around on foot more often (school, library).
- Family also moves more.
- Experienced well-being after physical activity.
- Changed perception of physical activity versus exercise training.
- Walks to take the dog out after the intervention.
- Engages in physical activity more regularly instead of all at once.
- Motivated by the watch.

Life events or factors that occurred during the study period

Nothing in particular

PARTICIPANT 12

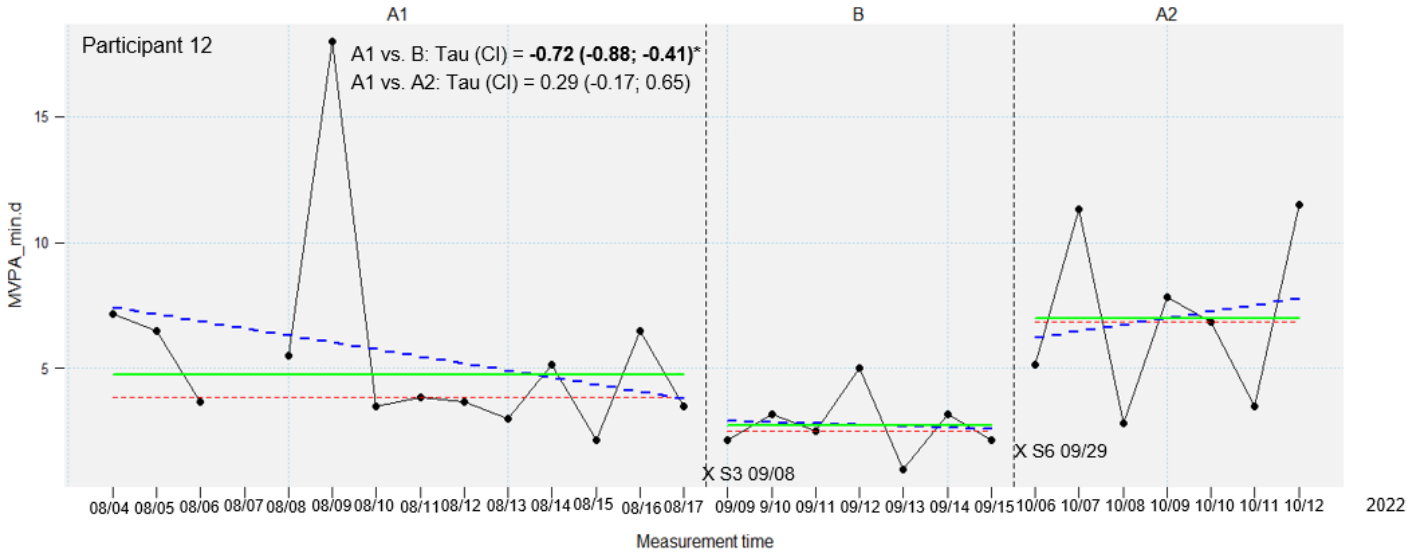
Characteristics

Participants	Age (years)	Sex	Marital status	Number of children	Professional status	Level of education	Income ($)	Ethnicity	BMI (k.m²)	Medical conditions	Smoking status / Alcohol consumption score
12	45	F	Married	2	Medical leave	High school	25,000-49,999	Hispanic	47.20	Dys, T2D, OSA, RA, CVD, RespiD, MH	Smoker / 0

Feasibility and acceptability outcomes

Participants	Counseling sessions					Research methods			
	Number of sessions completed	Duration of sessions (min)	Attrition (Y/N)	Acceptability anticipated sore	Acceptability retrospective score	Number of online surveys completed [% missing data in completed survey]	Interviews completed (Y/N)	Number of accelerometer wear days: phases A1; B; A2	Number of days with valid accelerometer wear time (9h/d): phases A1; B; A2
12	6	50.0 (48.8-57.5)	N	3,3	3.1	4[0%]	Y	14; 7; 7	13; 7; 7

Accelerometer data



Dashed blue line = trend, red line = median, green line = mean

Generalization Measures

Participant	Depressive symptoms								Anxiety symptoms								Physical composite summary*								Mental composite summary*							
	Phase A				Phase B				Phase A				Phase B				Phase A				Phase B				Phase A				Phase B			
	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4
12	26	25	21	13	18	18	18	18	11.3	13.8	27.5	26.3	12.9	19.3	22.0	31.3																

Participant	Self-declared MVPA (min/wk.)								Self-declared sitting time (h/d)								Self-declared leisure MVPA (min/wk.)								Self-declared travel MVPA (min/wk.)							
	Phase A				Phase B				Phase A				Phase B				Phase A				Phase B				Phase A				Phase B			
	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4
12	0	0	0	120	5.0	15.0	14.0	15.0	0.0	0.0	0.0	30	0.0	0.0	0.0	90																

Perceived benefits

- Did not maintain the changes.
- No improvement in social aspects.
- Walked more during the intervention (movement for a particular purpose).
- Improved endurance.
- Support from their partner.
- Sought social support (friend).
- Realistic goal setting.

Life events or factors that occurred during the study period

Two family members dead during phase B