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POTENTIAL EFFICACY OF PRAGMATIC EXERCISE PROGRAM (SPRINT) DURING HOSPITALIZATION IN OLDER ADULTS ON HEALTH CARE AND PHYSICAL PERFORMANCE: A PILOT STUDY

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Abstract: *Objectives:* Immobilization contribute to iatrogenic decline in hospitalized older adult. Implementing physical activity (PA) seems to be one of the best and easy solution. However, PA interventions are poorly integrated into usual care and those available are either non-specific, need supervision or requested human/material resources. Thus, we aimed to assess the effect of a pragmatic, unsupervised, and specific PA program (SPRINT) on health care practice and functional capacities in hospitalized older patients. *Design:* Single arm interventional pragmatic pilot study. *Setting:* Geriatric Assessment Unit (GAU). *Participants:* Of the 39 patients (> 65 years) hospitalized in a GAU and eligible, 19 agreed to participate (AP) and 20 declined (N-AP). *Intervention:* One of the 4 PA programs, developed by our team, was allocated according to mobility profile. Individual functional capacities (i.e. balance, walking speed, functional mobility profile (PFMP)), active time (METS> 1.5: min), length of hospitalization (LOS), discharge orientation were assessed at admission and discharge of GAU. *Results:* Baseline characteristics of the 2 groups were comparable. At discharge, the AP group improved more on walking speed (0.57 ± 0.21 vs. 0.64 ± 0.19; p = 0.013), Berg balance scale (41.8 ± 13.7 vs. 45.1 ± 9.7; p = 0.017) and PFMP (54.0 ± 7.1 vs 55.1 ± 5.5; p = 0.042) than the N-AP group. The LOS was significantly shorter in AP group compared to the N-AP group (5 vs. 36 days; p = 0.026) and more subjects in the AP group were oriented at home without health or social services (89.5 vs. 60%; p=0.065). *Conclusion:* SPRINT appears effective to counteract iatrogenic decline and decreased the LOS. Moreover, this simple pragmatic PA tool seems to improve the life trajectory and healthcare practice in aging population. Further researches are needed to confirm these promising pragmatic results.

Key words: Frailty, geriatric, aging, physical activity, hospital, mobility, health system.

Introduction

It is well known that hospitalization leads to functional decline, also called iatrogenic decline, in the older adult population. More specifically, hospitalization in older patients is associated with a decreased in muscle function (1). Kortebein et al. showed muscle strength and muscle mass losses of 16% and 6%, respectively, after 10 days of hospitalization (2). Moreover, seniors recently discharged from hospital are at a particularly high risk of falls (3) and disability (4). Previous studies have shown that 14% of older adults will fall within the first month after hospital discharge and that 34% will fall within three months of being discharged from inpatient rehabilitation (5). In addition, one year after admission, 33% of patients suffer from functional decline (6). More importantly, these consequences, related to iatrogenic decline, are mostly due to low physical activity during hospitalization (7). In fact, hospitalization increased by 6h lying position and decreased by 4h and 2h sitting and standing positions, respectively, given a bed rest time around 17h per day (8).

Thus, implementing physical activity intervention seems a solution to counteract this deleterious vicious circle. However, evidence for the effect of physical interventions on physical performance among older patients during hospitalization was inconsistent in a recent meta-analysis including 50 randomized controlled trials (RCT) (9). Nevertheless, the physical interventions that were continuously adapted to the patient's capabilities (n=8) showed positive results on physical performance (9). Another meta-analysis published in 2019 and including 30 studies, aiming to assess the impact of strategies to promote mobilization on physical function in hospitalized adults with medical conditions, showed a small but significant effect on length of stay, falls, walking speed and physical performance (10). Recently, a RCT showed that implementing an in-hospital intervention including individualized moderate-intensity resistance, balance, and walking exercises (i.e. 2 daily sessions) improved statistically but also clinically functional capacities (SPPB; (11)) dynamic or isometric muscle strength and power (12).

Despite the encouraging results of the published studies, certain limits should be emphasized. First, the interventions are not always adapted or specific to the patient. Second, the outcomes are very heterogeneous and the sample sizes small, which makes it difficult to generalize the conclusions. Third, the exercises sessions proposed in the studies are, in majority, individual or using gym equipment. Finally, the physical

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activity programs require supervision of health professionals. All these limits, in addition to ageism behavior, are the barriers reported by healthcare team to explain why physical activity programs are not systematically prescribed during usual care (13).

Furthermore, the social and economic cost of physical exercise interventions is a cause of concern. Thus, implementation of an effective and sustainable systematic PA program to prevent functional decline in older during hospitalization are warranted (14). To date, the cost-effectiveness of PA interventions has been poorly studied in the scientific literature. The literature reviews published by Davis et al. (2009) and Balzer et al. (2012) focused on falls prevention (15, 16) and demonstrated that personalized interventions, including strength and balance training and multi-component interventions are cost-effective or reduce the healthcare costs linked to falls. In addition, Farag et al. studied the cost-effectiveness of a 12-month exercise program for older adults following hospital discharge (17). This program appeared to offer a reasonable cost-effectiveness ratio for self-reported mobility and health status. Nevertheless, in this study, physical activity prescription was neither personalized nor adapted to each participant. The personalization of the PA program could further improve cost-effectiveness.

Overall, considering 1) the recognized importance of PA prescription to prevent the functional decline of seniors during hospitalization; 2) the absence of integrated organizational processes for the implementation of PA prescriptions; and 3) the need for studies on the cost-effectiveness of PA programs in order to inform decision-makers about the economic impact of these interventions, as well as their collective cost-effectiveness; the development of a systematic process for prescribing adapted and personalized exercises, which would be integrated into the processes of hospitalization and hospital discharge, is crucial to maintaining the quality of life and independence of older adults, and could be an effective option considering increasingly limited healthcare resources.

This is why, we decided to develop a pragmatic, unsupervised, and specific physical activity program (SPRINT: SPecific Retraining in INTerdisciplinarity) for hospitalized elderly patients in order to improve the life trajectory and healthcare trajectory in aging population but also health care practice. We previously showed that implementing the SPRINT is feasible and acceptable in Geriatric Assessment Unit (GAU) (18). Thus, the main aim of the present study is to assess the effect of the SPRINT on functional capacities in hospitalized older patients. The secondary objective is to assess the effect of the SPRINT on healthcare practice and system.

Methods

Study design and participants

This prospective pragmatic single-arm pilot study was performed in a GAU located at IUGM (Institut Universitaire de Gériatrie de Montreal, Montréal, Quebec). The study has been approved by our institutional hospital- based ethics committee under registration number CER IUGM 14-15-016.

Participants aged >65 years were recruited from the patients successively admitted to this GAU (between October 2014 and end of January 2015). Selection criteria were as follows: (1) written informed consent; (2) length of stay > 7 days, (3) no terminal phase of illness, (4) planned to not be discharge to a long-term care facility; (5) no exercise contraindications; (6) able to maintain at least a seated position, (7) able to speak/understand French or English.

Intervention

The main component of the intervention was SPRINT program, which consists of four exercise levels color-coded according to a level of mobility during hospitalization. Each level, but one, include 2 exercise subtypes which do not required materiel or specific room. Subtype 1 can be done by the patient alone or with a caregiver or professional. Subtype 2 must be done exclusively under the supervision of a professional. The session duration was set at 20 min on average (depending of patient' mobility level). To be more ecological and pragmatic, the minimum or maximum number of sessions was not enforced.

Briefly, as previously published, 58% of patients received one of the levels (green) and one level (red) was never given. In average, patients realized 23 sessions during their hospitalization (1 session/day), executed the session mostly during the day (84%) and realized it by themselves (22.2%) or with a nurse (37.1%). On average, SPRINT Ex level were begun ~5 days after admission. More importantly, our previous publication demonstrated that the SPRINT was feasible and acceptable by patient (acceptability: 74% and enjoyment: 96%) and health professionals (acceptability: 78%) (18).

Procedures and measurements

All newly admitted GAU patients were evaluated by a physiotherapist within 24–48 hrs (or post delirium) for eligibility, consent and allocation of a SPRINT exercise level.

After clinical stabilization, physician collected, during a face-to face interview or using medical records, the following data to capture the characteristics of our population: age, gender, educational level, marital status, living environment, delirium, diagnosis at admission, modified cumulative illness rating scale for Geriatrics (CIRS-G) (19), Mini-Mental State Examination (MMSE) (20), number of drugs, hospitalization length of stay, discharge orientation (type and needs of services). As described below, physiotherapists or nurses also performed physical assessment with patients who were eligible at admission (AP group and N-AP group) and at discharge (AP group only): activities of daily living (ADL), balance (Berg scale), mobility (PFMP), gait parameters (3-m normal Timed Up and Go test (TUG)) and non-sedentary behavior (METS >1.5: min). Finally, an interview to obtain the attitude and

Table 1
Comparison between AP-group and N-AP group at admission

Variables	AP-groupe (n=19)	N-AP group (n=20)	P-value
Age (years)	77.5 (73.6-87.3)	82.8 (78.8-85.3)	0.465
Women (%)	52.6	60.0	0.751
Living at home (%)	78.9	60.0	0.301
Visiting caregiver at the hospital (%)	47.4	50.0	1
Body mass index (kg/m²)	25.9 (21.9-30.2)	23.8 (21.0-29.7)	0.653
Number of drugs	10.0 (7.0-12.0)	10.5 (7.0-12.0)	0.799
Mini-Mental State Examination score (/30)	28.0 (23.8-29.0)	25.0 (22.0-29.0)	0.471
CIRS-G score (X/ 56)	32.0 (27.0-35.0)	31.0 (28.0-34.8)	0.921
SMAF-ADL score (X/-21)	-2.0 (-7.5-0.0)	-4.0 (-11.0- -1.0)	0.140
Fear of falling (%)	26.3	20.0	0.716
Chronic pain (%)	68.4	50.0	0.333
Berg Balance Scale score (/56)	47.0 (35.0-51.5)	43.0 (34.8-48.8)	0.530
Timed Up and Go score (seconds)	17.0 (12.5-30.0)	20.0 (15.9-30.0)	0.482
Walking speed score (m/s)	0.60 (0.41-0.76)	0.55 (0.40-0.75)	0.857
Diagnosis (%) :			n.a
- Nervous system	47.4	65.0	
- Mental	5.3	15.0	
- Musculoskeletal system	36.8	15.0	
- Others	10.5	5.0	

Legend: P-values obtained using non-parametric t-test (Mann-Whitney); Data presented as % or median (min-max); p<0.05 significant; n.a = non-applicable

beliefs towards physical activity from patients and caregivers was performed.

Activities of daily living (ADL)

The ability of the patient to realize by himself 7 activities of daily living (ADL) such as: 1) eating; 2) washing; 3) dressing; 4) grooming; 5)urinary function; 6) bowel function & 7) toileting have been evaluated using the validated Functional Autonomy Measurement System (SMAF) (21) at admission and before discharge. This questionnaire has been chosen since it is used in usual practice in IUGM GAU. For each item, the disability is scored on a 5-point scale: 0 (independent), -0.5 (with difficulty), -1 (needs supervision), -2 (needs help), -3 (dependent) for a total score of -21.

Balance

The validated Berg Balance scale (BBS) which is a performance-based outcome developed to provide the standing static and dynamic balance of elderly individuals has been used (22). The BBS grades performance on 14 tasks using five-point scales that range from 0 to 4. The individual scores are summed, for a potential total score of 56 (higher scores represent increased speed or safety of task performance).

Mobility

Mobility profile was evaluated using the validated Physiotherapy Functional Mobile Profile (PFMP) tool (23). The PFMP was originally designed to assess functional mobility in geriatric population. The PFMP included nine items: 1) bed mobility; 2) lie to sit; 3) sitting balance; 4) sit to stand; 5) standing balance; 6) transfers; 7) wheelchair locomotion; 8) ambulation indoors and; 9) stairs. The PFMP uses a 7-point scoring system: 7 = total independence whereas 1 = complete dependence. The PFMP score range from 63 to 9. Thus, a low score corresponds to high degree of assistance needed by the subject to perform mobility tasks.

Gait parameters

Walking speed (m/sec) was estimated using the validated « Timed Up and Go » test. This test, which consists in standing from a chair, walking a 3-meter distance and sitting down again (24), was performed at a comfortable and self-paced (TUG). A duration above 30 seconds indicates limited mobility and an increased risk of falling whereas a duration of less than 20 seconds indicates appropriate mobility with subject likely to be independent in activities of daily living (25).

Table 2
Belief on Physical activity

Variables	Strong disagreement	Disagreement	Neutral	Agreement	Strong agreement
Improve physical health (%):					
- Patient	0	0	21.1	21.1	57.9
- Caregivers for their relatives	0	0	14.3	28.6	57.1
- Caregivers for themself	0	0	0	14.3	85.7
Increase muscle strength (%)					
- Patient	0	0	16.7	27.8	55.6
- Caregivers for their relatives	0	0	14.3	14.3	71.4
- Caregivers for themself	0	0	0	42.9	57.1
Provide enjoyment (%)					
- Patient	5.3	10.5	31.6	21.1	31.6
- Caregivers for their relatives	0	28.6	71.4	0	0
- Caregivers for themself	0	14.3	28.6	28.6	28.6
Provide personal satisfaction (%)					
-Patient	10.5	5.3	15.8	36.8	31.6
- Caregivers for their relatives	0	0	42.9	42.9	14.2
- Caregivers for themself	0	0	14.3	28.6	57.1
Increase ADL (%)					
- Patient	5.9	0	23.5	47.1	23.5
- Caregivers for their relatives	0	0	42.9	42.9	14.3
- Caregivers for themselves	0	0	0	57.1	42.9
Increase pain (%)					
- Patient	27.8	16.7	27.8	27.8	0
- Caregivers for their relatives	14.3	14.3	14.3	28.6	28.6
- Caregivers for themself	71.4	0	28.6	0	0
Increase falls and injuries (%)					
- Patient	26.3	5.3	31.6	15.8	21.1
- Caregivers for their relatives	0	14.3	28.6	28.6	28.6
- Caregivers for themself	85.7	0	14.3	0	0

Likert scale: 5- level likert type scale; 1 = « very disagree » and 5 = « very agree »

Physical activity monitoring

Patients wore a validated tri-axial accelerometer (Sensewear armband; Model MF-SW; BodyMedia©) on their triceps (mid-humerus point) during a consecutives 24h, at admission and at mid length of stay (26). This is the gold standard portable instrument to measure the active time (min) (periods over 1.5 metabolic equivalents). This METS cut point has been chosen since a person under 1.5 METS is considered in sedentary behavior, such as in sitting or bed rest position. The information like sex, age, body weight, height, handedness and smoking status were entered into the software to calibrated and adjusted data acquisition (Armband Sensewear Standard Software 8.0).

Physical activity Beliefs

The beliefs on physical activity effect have been collected using a questionnaire with a 5-level Likert-type scale, where 1 = « very disagree » and 5 = « very agree » for themselves (patient or caregivers) or for their relatives (caregiver). Facilitators and barriers to the PA practice that were evaluated are: 1) Improve physical health; 2) Increase muscle strength; 3) Provide enjoyment; 4) Provide personal satisfaction; 5) Increase capacities to realize ADL; 6) Increase pain; 7) Increase falls and injuries.

Statistical Analyses

Quantitative data were expressed as mean ± SD, median and interquartile range, or percentage. Characteristics of AP vs. N-AP groups were compared using Wilcoxon paired t test, Mann-Whitney U Test or Fisher's Exact Probability Test when appropriate. Results were also reported as "clinically significant" if the improvement is considered in health practice to have an impact for the patient or the institutions. SPSS Statistics® (Windows, v24.0) was used. Qualitative data were analyzed by determining the number of times an element was reported.

Results

Participants

A total of 50 patients were admitted to the GAU during the study period. Among this number, 11 were ineligible (i.e. mobility contraindication (n = 5), length of stay ≤ seven days (n=2), living in a LTCF (n = 2) or language (n = 2)) and 39 were eligible. Among eligible subjects, 19 accepted to do the SPRINT program and 20 declined for various reasons (i.e. refused physiotherapy evaluation (n=2), could not collaborate because of neurocognitive psycho-behavioral problems (n=8), severe Parkinson's disease motor fluctuations (n=3), declined participation (n=7)). Finally, 19 patients were enrolled in the SPRINT program (Figure 1).

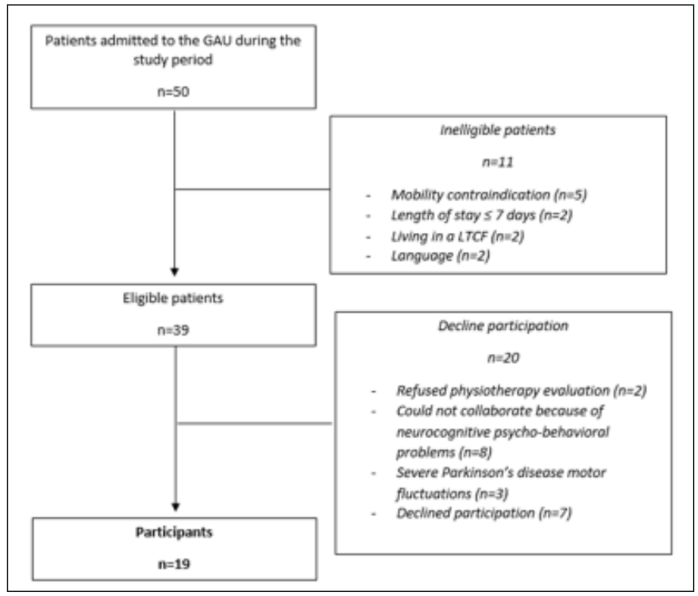
Characteristics of AP group vs. N-AP group, at admission are presented in Table 1. The median age was 77.5 (73.6-87.3) in the AP group and 82.8 (78.8-85.3) in the N-AP group. These groups included, respectively, 52.6% and 60% of women. No significant difference was observed between groups at baseline.

Belief on physical activity effects on health

As shown in Table 2, we observed that the belief on physical activity effects on health are very different between the patient and the caregivers. More specifically, the majority of caregivers (85.7%) strongly agree that physical activity improve physical health for themselves. About half of them strongly agree that physical activity increase muscle strength (57.1%), provide personal satisfaction (57.1%), increase ADL (42.9%) while a third of them believe that physical activity provide enjoyment (28.6%). Then, for their relatives, 57.1% of the caregivers strongly agree that physical activity improve physical health. Moreover, some of them think that physical activity increase muscle strength (71.4%) or ADL (14.3%) of their relative. However, 28.6% think that physical activity increase pain, falls and injuries of their relative. Finally, the half of patients strongly agree that physical activity improve physical health (57.9%) and increase muscle strength (55.6%) while no patient disagrees with these claims. Some patients also strongly agree that physical activity provide enjoyment and personal satisfaction (31.6%) or increase ADL (23.5%). Roughly a quarter of patients strongly disagree that physical activity increase pain (27.8%), falls and injuries (26.3%). Nevertheless, 21.1% of patients strongly agree that physical activity induce falls and injuries.

Figure 1

Flow chart of the participants selection



Health impact of SPRINT implementation at discharge

Regarding health impact of SPRINT implementation at discharge (Table 3), AP-group had shorter median length of stay (25 (21-37) vs. 36 (29-46.5) days; p = 0.026) and returned more at home (89.5 vs. 60.0%; p = 0.065) than N-AP group. More specifically, 52.7% in AP-group versus 20% in N-AP group are discharged at home without service.

More importantly, as shown in Table 4, adherence to SPRINT program, improved functional capacities significantly and more specifically walking speed (0.57± 0.21 vs. 0.64±0.19; p= 0.013), Berg balance scale (41.8±13.7 vs. 45.1±9.7; p= 0.017), and PMFP score (54.0±7.1 vs. 55.1±5.5; p = 0.042) in AP group. In addition, non-sedentary level (MET > 1.5; min) clinically increased in AP group (56.6±47.2 vs. 101.9±51.1 min). Finally, ADL did not decline and tended to increase.

Discussion

Based on the scientific literature and our clinical experience, implementation of PA program is needed to reduce functional decline to often observed in hospitalized older people, especially those who are living at home at admission. The keys elements in the implementation of the PA program are as follows: (1) training for the staff (physician, physiotherapist, nurse, etc.), (2) training for the patient (very simple tools, not expensive devices..), (3) simple (easy to understand), (4) feasible (no extra work for the team), (5) personalized (prescribing adapted physical activity to mobility profile), (6) self-management by the patient (low human resources) and (7) safe. Therefore, in order to contribute to fill this gap, we decided to assess the effect of a pragmatic, unsupervised, and

Table 3
Comparison of SPRINT implementation on health care practice between AP and N-AP groups

Variables	AP-group (n=19)	N-AP group (n=20)	P-value
Length of Stay (days)	25.0 (21.0-37.0)	36.0 (29.0-46.5)	0.026*
Discharge orientation (at home; %)	89.5	60.0	0.065*
- Home without service (%; n)	52.7 (n=10)	20 (n=4)	
- Home with services (%; n)	36.8 (n=7)	40 (n=8)	
- Assisted Living Communities (%; n)	10.5 (n=2)	40 (n=8)	

Data are presented as % or median (min-max); p<0.05 significant; * clinically significant; P-values obtained using non-parametric t-test (Mann-Whitney).

Table 4
Effect of SPRINT adherence on physical & functional parameters in AP group

Variables	Admission	Discharge	P-value
Activities Daily Living (ADL)			
Eating (yes; %)	100	100	1.00
Washing (yes; %)	42.1	50	1.00
Dressing (yes; %)	68.4	72.2	1.00
Grooming (yes; %)	68.4	83.3	0.50
Urinay function (yes; %)	52.6	72.2	0.25
Bowel function (yes; %)	94.7	100	1.00
Toileting (yes; %)	78.9	94.4	0.50
Functional capacities			
Berg Balance Scale score (X/56)	41.8±13.7	45.1±9.7	0.017
3 meters normal TUG (seconds)	22.0±12.4	23.6±12.4	0.937
Walking speed score (m/s)	0.57±0.21	0.64±0.19	0.013
PFMP (X/63)	54.0±7.1	55.1±5.5	0.042
Physical activity level			
Total non-sedentary PA (MET > 1.5; min)	56.6±47.2	101.9±51.1	0.12*

Data presented as % or mean ± standard deviation; p<0.05 significant. PFMP: Physiotherapy Functional & Mobility Profile; PA = Physical activity; MET: Metabolic Equivalent of Task
P-values obtained using non-parametric paired t-test (Wilcoxon). * clinically significant

specific PA program (SPRINT) on health care practice and functional capacities in GAU hospitalized older patients.

First of all, our results indicate that the belief on physical activity effects on health are different between the patient and the caregivers and more importantly, these beliefs need to be taken in consideration to be able to implement the SPRINT program. Indeed, according to a Delphi study published in 2010, an important factor in the initiation of physical activity is a person's expectations that the activities will result in positive outcomes (27). These expectations may relate to health, social or other desired outcomes. As people get older, they are less interested in improving their health, but more interested in retaining the health and capacities they already possess (28). Moreover, our results suggest that 21.1% of patients strongly agree that physical activity induce falls and injuries. Given this, it is important for PA programs to reassure potential participants that they are unlikely to incur injuries or otherwise harm themselves (29). In addition, around a third of patients and caregivers believe that physical activity provide enjoyment. It is also an important point to take into account in the development of PA program because, according to a systematic review, many people will be more interested in activities that they view as being intrinsically enjoyable, such as interactions with other people who are also performing the activities (30). The SPRINT program meets these expectations since Juneau et al. have previously demonstrated that 75% of older patients and 33% of caregivers enjoyed performing the SPRINT (18).

Then, regarding health impact of SPRINT implementation program, the present study highlighted that patients following the SPRINT program have significant lower Length of Stay

(LoS) and need of resources following the discharge compared to non-participants, even if they are similar at admission. Our results corroborate those of the systematic review conducted by Peiris et al. which highlighted that extra physical therapy decrease length of stay in people with acute or subacute condition (31). In view of this result, implementing SPRINT program could have positive impact on health care systems by reducing the cost pressures. Overall, SPRINT could be considered as cost-effectiveness. Based on the study of Rashidi et al., the mean cost (SD) for each admission in Canada was $49,923 CDN for a median length of stay of 27 (18–48) days (around $1850 per day) (32). Therefore, decreasing by 11-days a length of stay per patient could significantly reduce costs related to hospitalization in GAU whereas the human cost for implementing the SPRINT program is only $ 415 CDN per patient / LoS (i.e. 1.5 hour need to choose the SPRINT EX level, teach the program and print the sheets related to the SPRINT EX level + 15 min/day of additional EX supervision). In addition, the SPRINT does not seem to reduce only the cost of hospitalization but also the cost of home healthcare services since 52.7% in AP group versus 20% in N-AP group are discharged at home without service. Effectively, the cost of nursing home care includes accommodation (room and board) and health-care (nursing and personal care) and are estimated at approximately $20 to $50 per day in Canada (33). Besides the effects of the reduction in LOS and need of resources following the discharge on costs, the effects on quality of life (QoL) are important. Effectively, it is very well known that QoL of the older adults is considered better when they live at home rather than in institution (34, 35).

Our study also suggests that SPRINT is a pragmatic ecological exercises program requesting few human, materials and space resources but able to reduce or prevent iatrogenic during hospitalization since the AP group improved more walking speed, balance and mobility than the N-AP group. This important result confirms the existing literature according to which physical interventions during hospitalization induce positive results on physical performance (9-12). Considering the strong evidence that links functional abilities in the immediate post-hospitalization period to readmission risk, the SPRINT program could play an important role in reducing hospital readmissions and therefore, in improving healthcare quality (36). Moreover, from the patient point of view, it is admit that older adults' QoL is associated with the maintenance of autonomy and functional capacity (37).

The great strength of this study is to offer an innovative, unsupervised, and specific physical activity program (SPRINT) specific for hospitalized elderly patients. However, some limitations must be discussed. First, this pragmatic study did not compare the effect of the SPRINT program with another PA program or control group (usual care). However, meta-analyzes have synthesized the effects of activity programs during hospitalization, which gives us a solid basis for comparison. In addition, even if we created 4 levels of exercises, the prescription was partly subjective (physiotherapist decision based on his clinical evaluation inducing a potential human bias). Thus, this small limit needs to be changed to be able to replicate everywhere this pragmatic ecological promising program. Then, the sample size was small, thus limiting statistical power. In addition, a selection bias is possible since only volunteers were included in this study. These subjects are probably not representative of all hospitalized older adults. This means that our conclusions should be interpreted and generalized with particular caution. However, significant results were found, encouraging further broader scale investigations. Furthermore, the post-intervention effects should be evaluated to assess whether the benefits of the intervention persist over time.

In conclusion, the SPRINT program appears effective at the patient level, by preventing the iatrogenic functional decline and, at the healthcare level in reducing the length of hospital stay among older adults. Nevertheless, further researches are needed to confirm these promising pragmatic results.

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Ethical Standards: ???????

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