



# **A systematic review and meta-analysis of physical activity intervention for community- dwelling older adults**

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# Background

- **Physical activity (PA) interventions** in the literature usually refers to behavioural change intervention that **educate/counsel/advise** participant to adhere to the **PA health recommendations** and one of the aims of the intervention is to help participants to maintain the PA behaviour.



# Aims and objectives

- This presentation aims to systematically review physical activity interventions developed for community-dwelling older adults in the literature in the recent years (2013-2018) and to determine the overall effectiveness these interventions.

# Methods

- A systematic review of literature was conducted to review interventional studies for community-dwelling older adults. Literature from 2013 to 2018 is the focus. Relevant literatures were searched through internet on the **CINAHL Plus, Medline, ProQuest, Psychinfo, PubMed and SportDiscus** databases.

# Methods

Interventional studies were only included if:

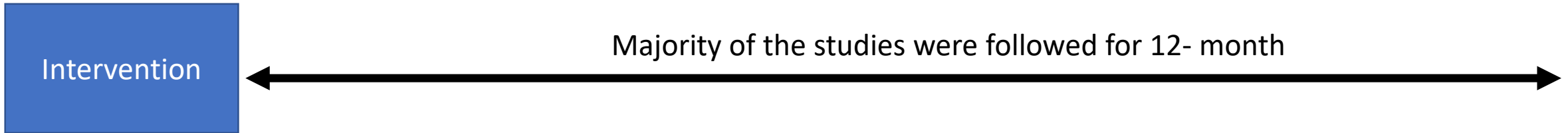
- the subjects were apparently healthy community-dwelling older adults;
  - physical activity behavior was one of the outcome measures;
  - mean age of participants > 59 years old;
  - the study design was quasi-experimental design or randomized controlled design
- Exclusion criteria:
    - intervention include a nutrition or diet component
    - focus on specific clinical condition (e.g. fall-prevention)

# Studies Characteristics

- Based on the criteria, 11 studies published between 2013 to 2018 were included in the review.
- The studies were conducted in Canada, USA, Netherlands, Germany and United Kingdoms.
- Over half of the studies were randomized controlled studies and the rest were quasi-experimental design studies.

# Intervention duration and follow-up duration

5 weeks to 12 months



- PA Intervention duration for community-dwelling older adults ranged from 5 weeks to 12 months
- Majority of the interventions last for 3 months
- Among the reviewed studies, the longest follow-up period was 14-month
- Majority of the studies were followed for 12- month

# Mode of Delivery

- Single or multi-component behavioural change intervention with or without structured PA/exercise component, counselling, consultation and handbook were the mode of delivery of PA interventions of the included studies



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# Mode of Delivery

- Structured exercise practice (i.e. aerobic activity, muscle-strengthening, flexibility and balance exercise) + education sessions/print materials (4)
- Face to face exercise practice (2)
- Walking group + group education+ printed materials+ counseling calls (1)
- Home-based DVD package (1)
- Community-based exergaming (1)
- Individual/group counselling with smart device/handbook (2)

# Interventionist

- Majority of the interventionalists have a background related to **applied health sciences**
  - Health fitness specialist
  - Exercise Physiologist
  - Psychologist with doctoral degrees
  - Practice nurse
  - Researcher with experience in holding PA programs
  - Trained personnel/university students
  - Two studies did not have interventionist (DVD and handbook)



# Behavioural model

- Ecological model
- Social-cognitive model
- Wellness theory
- Transtheoretical model
- I-change model
- Lifespan theories
- Selection optimization and compensation theory
- Social-emotional selectivity theory
- Self-determination theory
- Health action process approach

# Physical Activity as outcome measurement

- Single-item
  - “Do you currently do any type of regular physical activity for a minimum of 30 mins 3 times a week?”
  - “Do you currently engage in regular physical activity?”
- Well established scale
  - Godin Leisure Time Exercise Questionnaire (GLTEQ)
  - PAQ-50+ Instrument for the assessment of middle-aged and older adults’ physical activity
  - Champs Physical Activity Questionnaire (CHAMPS)
  - PRISCUS-PAQ
  - Phone-FITT
- Accelerometry sensors
  - Actigraph
  - GeneActiv
  - GT3X- plus

# A meta-analysis on the mean effect size (ES) of PA intervention on community-dwelling older adults

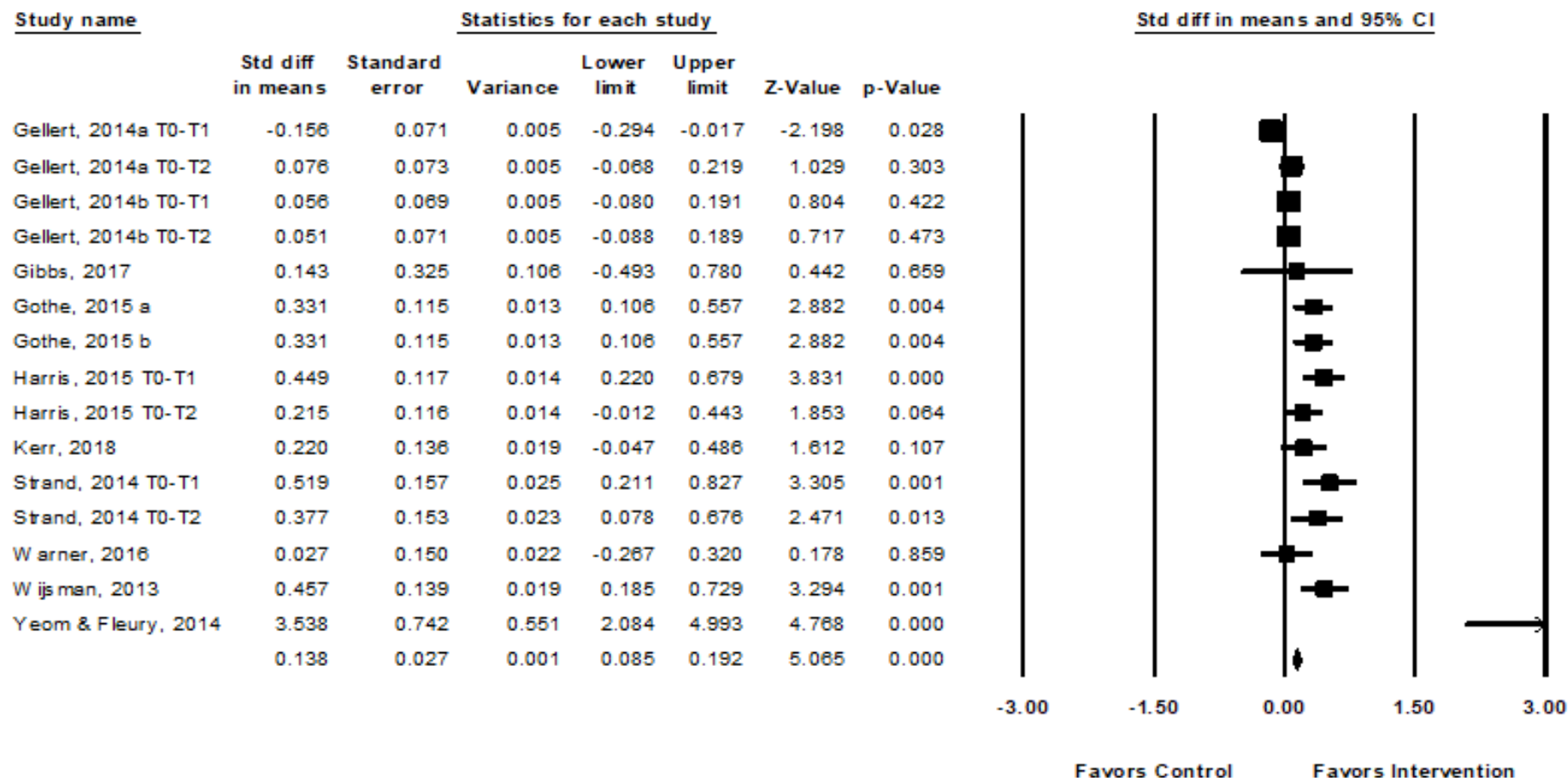
- Statistical analyses were performed using **Comprehensive Meta-Analysis Software** (M. Borenstein, Hedges, L. V., Higgins, J. P. T., & Rothstein, H. R.,, 2005)
- Standardized mean difference ESs ( $d$ ) were calculated for all the above studies which provided sufficient data for analysis.
- The overall mean ES is conceptually defined as the mean of the treatment group minus the mean of the control group divided by a pooled standard deviation.

# A meta-analysis on the mean effect size (ES) of PA intervention on community-dwelling older adults

- ESs were synthesized using a **random-effects model**, account for between study and within-study variances. Studies utilized both subjective (e.g., PA scales) and objective measures (e.g., accelerometer) of PA behavior outcomes were included in the analysis

# A meta-analysis on the mean effect size (ES) of PA intervention on community-dwelling older adults

- If a single study contained two intervention groups and no control group, then each group was coded as one-group pre-test post test design
- Studies with multiple time-points, effect size for different times were calculated.
- The overall ES was 0.14 (95% 0.09-0.19,  $p < .001$ )



**Random-effects**



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