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# Effectiveness of physical activity interventions on return to work for cancer patients: a meta-analysis.

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## Background

Cancer, leading cause of morbidity worldwide with approximately 19.3 million new cases diagnosed in 2020 [1]. Cancer and its treatment impact the quality of life and work ability of cancer survivors, making it difficult to maintain or return to work (RTW). In recent years, several interventions including physical activity (PA) have been developed to improve the quality of life of cancer patients and help them to RTW after treatment [2]. The objective of this meta-analysis was to assess the effectiveness of PA interventions on RTW in cancer patients, compared to usual care and estimate the dose of PA needed to improve RTW.

## Methods

A systematic review and meta-analysis were conducted according to PRISMA guidelines.

### Search strategy

To identify studies, we searched:

- ✓ six electronic databases
- ✓ grey literature,
- ✓ health organization websites
- ✓ the reference lists of included, Studies.



### Eligibility criteria

Studies were included following PICOS criteria.

PICOS	Criteria
Population	<ul style="list-style-type: none"> <li>✓ Adults aged ≥18 years,</li> <li>✓ diagnosed with cancer (all location).</li> </ul>
Intervention	<ul style="list-style-type: none"> <li>✓ PA interventions (e.g., aerobic exercise, resistance, stretching, endurance, yoga, or combinations of these exercises).</li> </ul>
Outcome	<ul style="list-style-type: none"> <li>✓ Rate of RTW (binary outcome) or</li> <li>✓ Time to RTW (continuous outcome).</li> </ul>
Comparator	<ul style="list-style-type: none"> <li>✓ Standard care or usual care.</li> </ul>
Studies design	<ul style="list-style-type: none"> <li>✓ Randomized controlled trials (RCTs),</li> <li>✓ Non-randomized controlled trials (nRCTs).</li> </ul>

### Procedure

Two review authors, independently:

- ✓ screened titles and abstracts,
- ✓ read the full texts of records,
- ✓ extracted data from included studies,
- ✓ assessed the risk of bias in individual studies.

Discrepancies between 2 reviewer authors were resolved by consensus.

### Synthesis of results

- ✓ A narrative synthesis: from included studies.
- ✓ Meta-analysis: to estimate overall effect size, pooled risk ratio (RR) of PA on RTW using random-effect model.
- ✓ A meta-regression: to estimate the association between exercise dose and intervention effect.

## Results

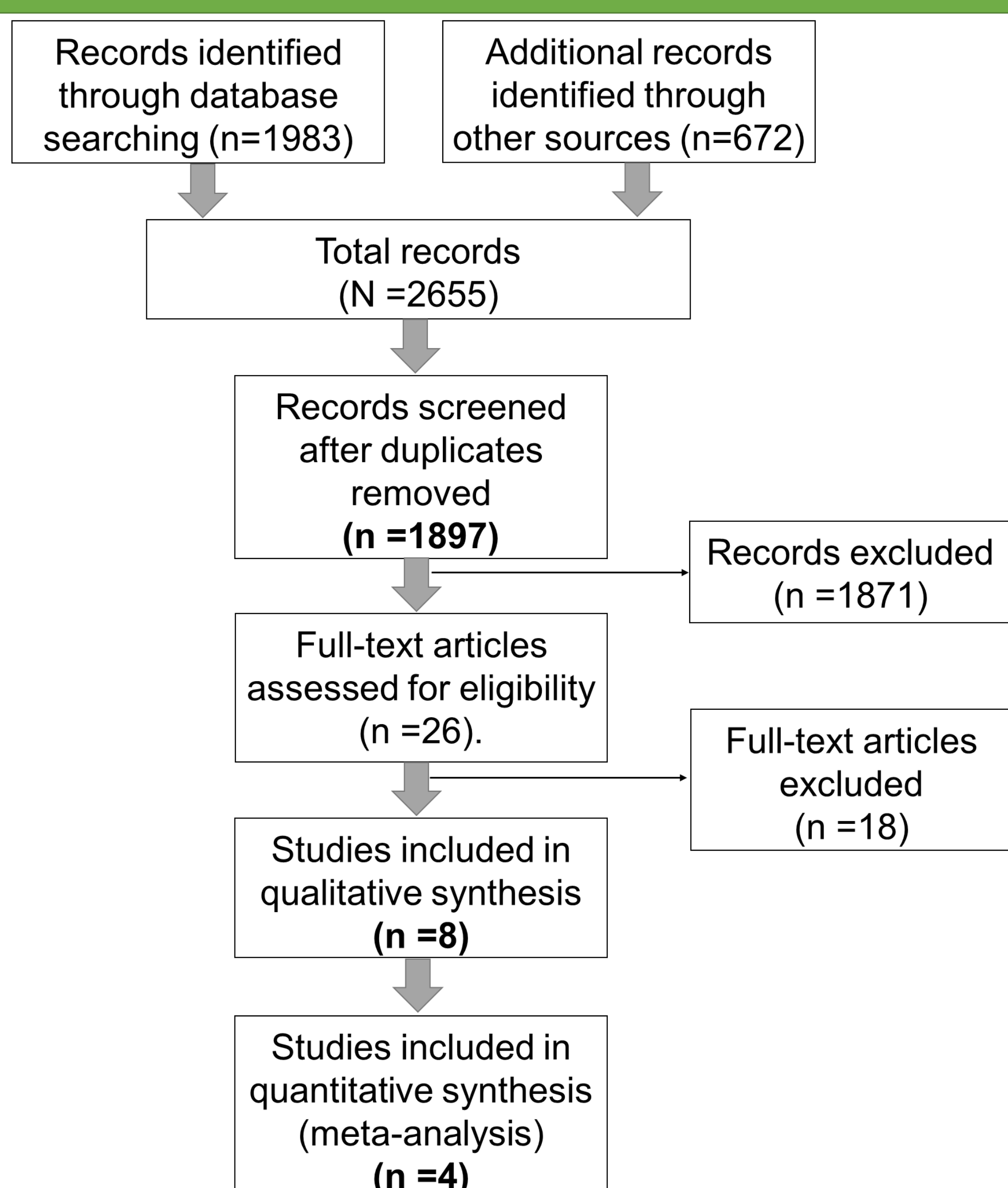


Figure 1. Flow chart of the study selection process.

## Results

Table 1. Characteristics of the 8 included studies.

Characteristics	Number of study (n=8)
<b>Publication year</b>	
• < 2010	3 (37%)
• ≥ 2010	5 (63%)
<b>Studies design</b>	
• Randomized controlled Trial	7 (88%)
• Non-randomized controlled trial	1 (12%)
<b>Geographic zone</b>	
• North America	3 (37%)
• Europa	5 (63%)
<b>Type of cancer</b>	
• Breast	5 (63%)
• Prostate	1 (12%)
• Mixte cancers (breast, colorectal, others)	2 (25%)
<b>Participants</b>	
• Total	1087
• Age (years): min-max	18-75

Table 2. Intervention's characteristics

Characteristics	Number of intervention (n=10)
<b>Type</b>	
• Aerobic exercise	2 (20%)
• Resistance exercise	2 (20%)
• Aerobic + Resistance exercise	1 (10%)
• Multicomponent exercises	1 (10%)
• PA combined with other interventions	3 (30%)
<b>Mode of delivery</b>	
• Supervised	8 (80%)
• No-supervised	2 (20%)
<b>Period of intervention</b>	
• Prior treatment	1 (10%)
• Prior and during treatment	1 (10%)
• During and after treatment	4 (40%)
• After treatment	4 (40%)
<b>Setting of intervention</b>	
• Hospital	5 (47%)
• Home	1 (26%)
• Hospital and home	4 (26%)
<b>Duration of intervention</b>	
• ≤ 12 weeks	4 (40%)
• > 12 weeks	6 (60%)

- Most of studies were RCTs and carried out in European countries. Of these, 2 were three-armed RCTs leading to 10 intervention groups.
- More than half studies involved exclusively breast cancer patients.
- The majority of interventions were supervised and delivered in hospital setting.

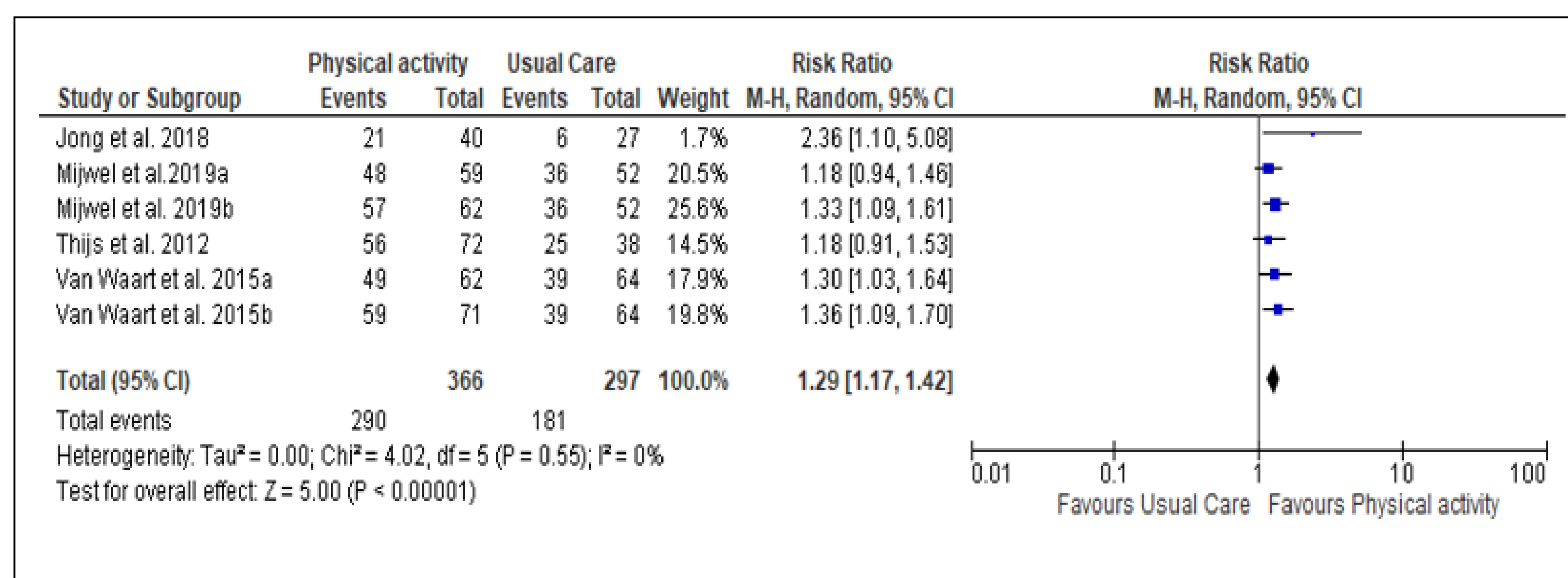


Figure 2. Forest plot of risk ratio for the effect of physical activity versus usual care on return to work.

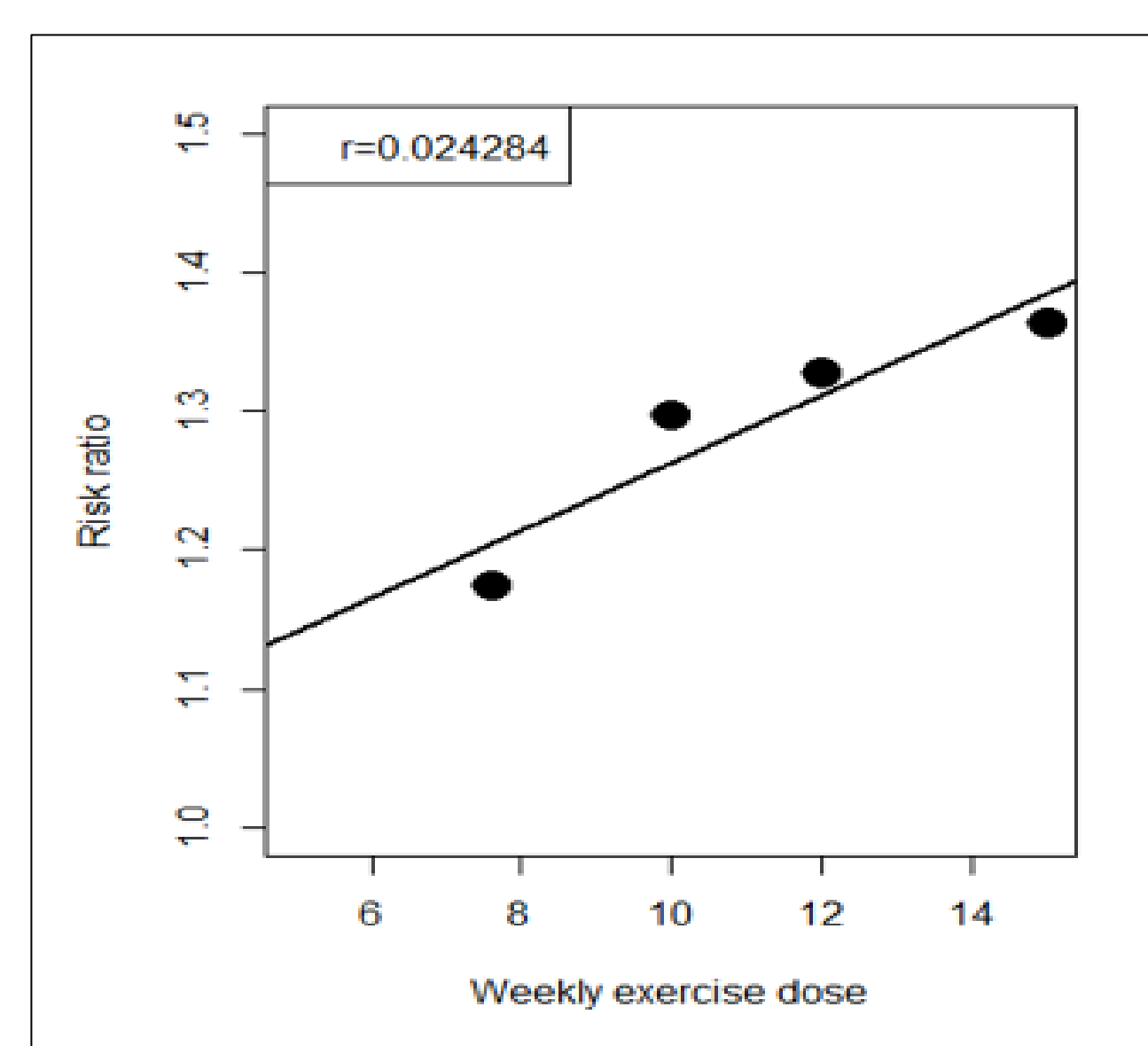


Figure 3. Meta-regression between risk ratio and weekly exercise dose.

- No heterogeneity existed among studies ( $I^2 = 0\%$ ).
- A significant effect of PA interventions on RTW compared to usual care with a pooled overall RR of 1.29 (95% CI: 1.17, 1.42).
- The meta-regression exploring the relationship between weekly dose of exercise and RR revealed a positive linear relation for RTW (regression coefficient = 0.024; P=0.0703) with weekly exercise dose between 7.6 METs.h/week and 15 METs.h/week.

## Conclusion

- There is moderate evidence that PA intervention have positive effects in increasing the rate of RTW among cancer survivors.
- The weekly exercise dose between 7.6 METs.h/week and 15 METs.h/week seems more efficacious to improve RTW.

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