

# **The Effectiveness of Comprehensive Physiotherapy in the Treatment of Adults with Rheumatoid Arthritis: A Systematic Review**

Shazeen Batada

Nicole Elfring

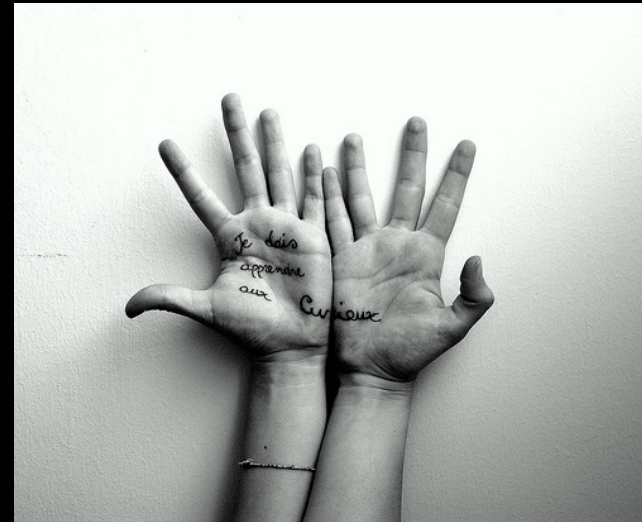
Mel Gris

Mikayla Martin

Julia Webb

# Outline

- BACKGROUND
- METHODS
- RESULTS
- DISCUSSION
- IMPLICATIONS FOR RESEARCH
- CONCLUSION
- IMPLICATIONS FOR PRACTICE



# BACKGROUND



# Rheumatoid Arthritis

- Definition:
  - Chronic inflammatory autoimmune disease that affects synovial joints and other organs<sup>1</sup>
- Characterized by:
  - Joint inflammation, joint damage, pain, stiffness, decreased muscle strength and ROM, difficulties with ADLs<sup>2</sup>



# Rheumatoid Arthritis

- Epidemiology:
  - affects ~ 1-2% of the population<sup>3</sup>
  - women 2-3 x's more affected than men<sup>3-4</sup>
- Disease implications:
  - Body structure/function → activity and participation<sup>5</sup>



# What do we know?

- Previous systematic reviews evaluating the efficacy of single physiotherapy interventions<sup>6-16</sup>
- Physiotherapy improves outcomes for individuals with RA<sup>11-18</sup>
- Multidisciplinary care is optimal<sup>19</sup>
- Number of alternative methods of care are emerging<sup>19</sup>

# Comprehensive Physiotherapy

- Combination of therapeutic interventions delivered by a PT based on client's needs<sup>20</sup>
- Various levels of rheumatology training



# Why do this review?

- No systematic review on comprehensive physiotherapy and managing RA
- The most effective and efficient method of physiotherapy delivery has yet to be determined<sup>21</sup>
- Evidence based practice



# Objective

To evaluate the effectiveness of comprehensive physiotherapy for adults with RA compared to waitlist control or a single non-pharmacological intervention

# METHODS



# Search Strategy

- Electronic search:

- EMBASE
- Medline
- CINAHL
- PEDro
- Cochrane
- DARE
- Proquest

- Hand search:

- Arthritis Care and Research (1998-2008)
- Reference lists of included studies



# Selection Protocol – Stage 1

- 2 reviewers independently screened titles and abstracts
- Selection criteria:

1. Kept if “rheumatoid arthritis” present & “physical therapy or physiotherapy” or “rehabilitation”
2. Excluded if “osteoarthritis, juvenile arthritis, or ankylosing spondylitis” present without “rheumatoid arthritis”
3. Kept if title or abstract ambiguous
4. Kept if article available in English

# Selection Protocol – Stage 2

- Full text articles divided among reviewers
- 2 reviewers independently examined each article for inclusion criteria

<b>P</b>	Diagnosis of RA and $\geq 16$ years of age
<b>I</b>	Comprehensive PT ( $\geq 2$ types of PT tx)
<b>C</b>	Waitlist or medical treatment control or single non-pharmacological intervention
<b>O</b>	Outcomes fit into at least one category of the ICF

# Selection Protocol – Stage 3

- Common trends emerged
- 2 subgroups created
  - **Post entry-level** rheumatology trained physiotherapy (PERPT)
  - **Entry-level** rheumatology trained physiotherapy (ERPT)



# Methodological Quality

- 2 reviewers independently scored each article using PEDro scale
- PEDro designed to assess RCTs for PT interventions<sup>22</sup>
- High quality = >50% of criteria met<sup>22-23</sup>



*6/10 a priori*

# Data Extraction

- Data extraction form made for review
- Pilot tested 3x to achieve inter-rater reliability
- 2 reviewers independently extracted data
- Disagreements resolved by discussion





# Outcomes

- Primary Outcomes

- Pain
- Functional Ability
- Health Related Quality of Life (HRQoL)
- Disease Knowledge
- Self-efficacy

→ **REASON:** Important tx goals ID by ppl with arthritis<sup>24</sup>

- Secondary Outcomes

- Any other outcome measures utilized in included studies

→ **REASON:** Multiple variables measured in tx of RA

# Outcomes & ICF

- ICF used to classify outcome measures
  - Inclusive nature
  - Globally agreed upon framework

Pain	Body Structure & Function
Functional Ability	Activity & Participation
HRQoL	Activity & Participation
Disease Knowledge	Contextual Factors
Self Efficacy	Contextual Factors

# Data Analysis

- Comparison groups:
  1. **PERPT** vs. ERPT or wait-list control
  2. **ERPT** vs. single non-pharmacological intervention or wait-list control
- Heterogeneity = no meta-analysis
- Effect Sizes (Hedge's  $g$ )  
reported as SMD & 95% CI



# Best Evidence Synthesis (BES)

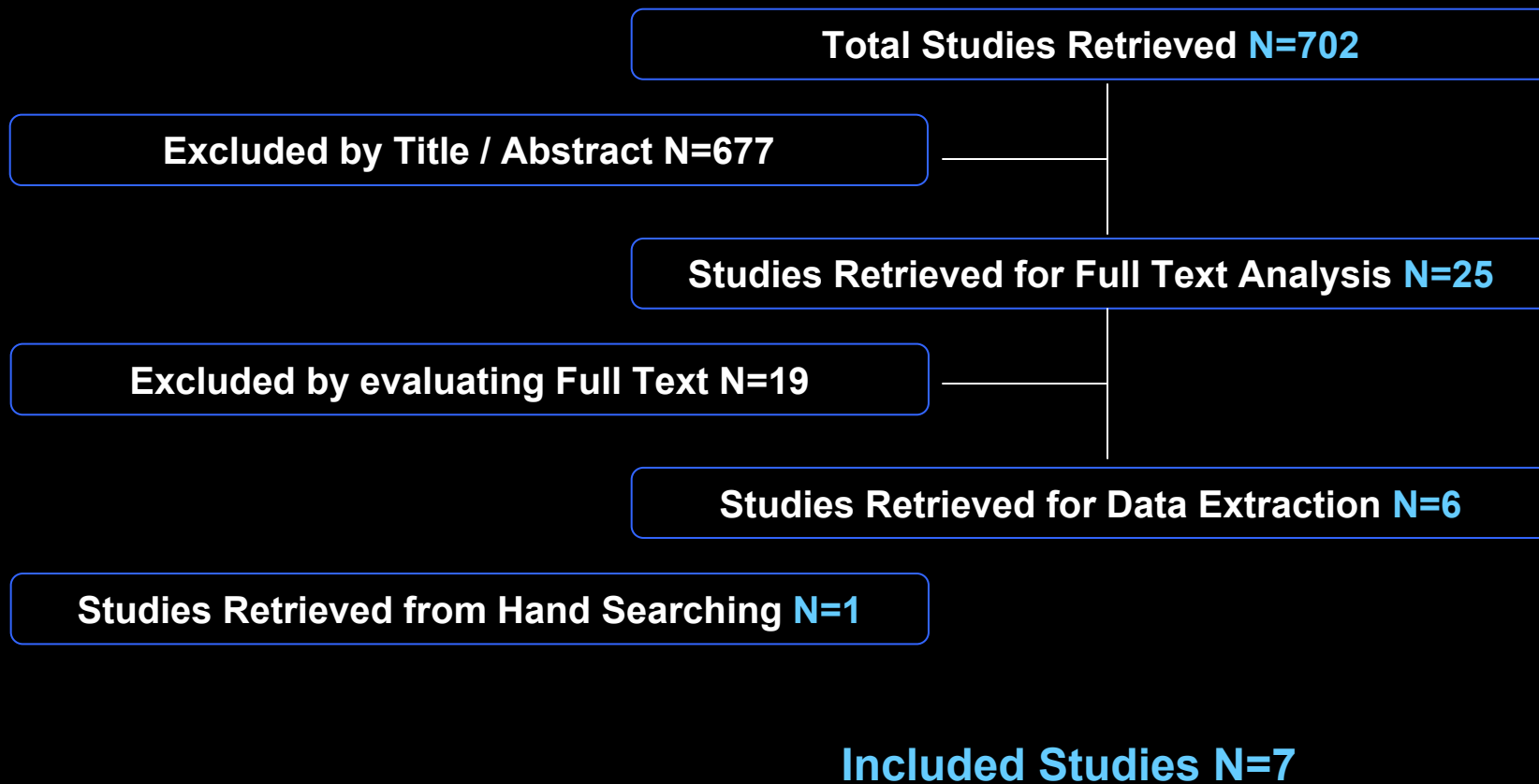
<b>Strong Evidence</b>	Statistically significant findings in outcome measures in $\geq 2$ high quality RCTs
<b>Moderate Evidence</b>	Statistically significant findings in outcome measures in $\geq 1$ high quality RCT & $\geq 1$ low quality RCT
<b>Limited Evidence</b>	Statistically significant findings in outcome measures in $\geq 1$ high quality RCT
<b>Indicative Findings</b>	Statistically significant findings in outcome measures in $\geq 1$ low quality RCT
<b>No Evidence</b>	No statistically significant findings for the outcome measures of this review or in the case of conflicting results among included studies

Adapted from Van Tulder et al, 2002<sup>25</sup>

# RESULTS



# Article Selection



# Studies

- **Post Entry-Level** Rheumatology Trained  
Physiotherapy (PERPT)  
4 Studies
- **Entry-Level** Rheumatology Trained  
Physiotherapy (ERPT)  
3 Studies

# Quality of Studies

Post Entry-Level Rheumatology Trained Physical Therapy (PERPT)		
Primary Author (Year)	Title	PEDro Score
Bell (1998)	A randomized control trial to evaluate the efficacy of community based physical therapy in treatment of people with rheumatoid arthritis	8
Helewa (1994)	Can specifically trained physical therapists improve the care of patients with rheumatoid arthritis? A randomized control trial	8
Li (2005)	Outcomes in home-based rehabilitation provided by primary therapists for patients with rheumatoid arthritis: A pilot study	6
Li (2006)	Effectiveness of the primary therapist model for rheumatoid arthritis rehabilitation: A randomized control trial	4



# Quality of Studies

## Entry-Level Rheumatology Trained Physical Therapy (ERPT)

Primary Author (Year)	Title	PEDro Score
Buljina (2001)	Physical and exercise therapy for the treatment of the rheumatoid hand	6
O'Brien (2006)	Conservative hand therapy treatments in rheumatoid arthritis- A randomized control trial	7
van den Berg (2006)	Using internet technology to deliver a home-based physical activity intervention for patients with RA: A randomized control trial	8

# Effect Sizes

Primary Author (Year)	Effect Sizes [95% confidence interval]				
	PAIN	Functional Ability	HRQoL	Disease Knowledge	Self Efficacy
<b>ERPT vs. single non-pharmacological or waitlist control</b>					
O'Brien (2005)	Not measured	0.03[-0.64, 0.70] -0.21[-0.89, 0.48] 0.12[-0.55,0.80] -0.27[-0.93,0.40] -0.01[-0.96,0.68] 0.04[-0.63,0.71]	Not measured	Not measured	Not measured
Van den Berg (2006)	Not measured	Not estimable	Not estimable	Not measured	Not measured
Buljina (2001)	<b>2.19[2.69,1.69]</b>	<b>0.81[0.40, 1.22]</b>	Not measured	Not measured	Not measured

# Effect Sizes

Author (Year)	Effect Sizes [95% confidence interval]				
	PAIN	Functional Ability	HRQoL	Disease Knowledge	Self Efficacy
<b>PERPT vs. ERPT or waitlist control</b>					
Li (2005)	0.34[1.67, -0.99]	-0.06[-1.38,1.25]	0.18[-0.65, 1.00] 0.29[-0.54, 1.12]	0.60[0.77,1.96]	Not measured
Li (2006)	0.01[0.41,-0.39]	0.03[-0.37,0.43]	Not measured	0.23[-0.17,0.64]	0.24[-0.19,0.67] -0.03[-0.46,0.39] -0.19[-0.24,0.62]
Bell (1998)	0.27[0.62,-0.08]	Not measured	Not measured	0.34[-0.02,0.69]	0.29[-0.06,0.64]
Helewa (1994)	Not measured	Not estimable	Not measured	Not measured	Not measured

# BES Results for Primary Outcomes

## ERPT vs. single non-pharmacological intervention or wait list control

Pain	Limited evidence
Functional Ability	<i>No evidence</i>
HRQoL	<i>Not estimable</i>
Disease Knowledge	<i>Not measured</i>
Self Efficacy	<i>Not measured</i>

## PERPT vs. ERPT or waitlist control

Pain	<i>No evidence</i>
Functional Ability	<i>No evidence</i>
HRQoL	<i>No evidence</i>
Disease Knowledge	<i>No evidence</i>
Self Efficacy	<i>No evidence</i>

\*Based on our effect size calculations

# BES Results for Secondary Outcomes

## ERPT vs. single non-pharmacological intervention or wait list control

↑ Key Grip Strength	Strong evidence
↑ Ability to perform mod-intense PA	Limited evidence
↑ ROM	<i>No evidence</i>
↓ Joint Tenderness	<i>No evidence</i>

## PERPT vs. ERPT or waitlist control

↑ Medication Compliance	Limited evidence
↓ Coping Efficacy	Indicative findings
↓ Morning Stiffness	<i>No evidence</i>

\*Based on findings reported by authors of included studies

# Overall Findings

- Limited evidence supporting treatment provided by entry-level rheumatology trained PTs vs. waitlist control for reducing pain
- No evidence for the effectiveness of treatment provided by PTs with post entry-level rheumatology training vs. ERPT or waitlist control for our primary outcomes

# DISCUSSION



# DISCUSSION

1. Counterintuitive Results
2. Findings for **PERPT**
3. Findings for **ERPT**
4. Strengths & Limitations
5. Implications for Research and Practice



# Why were the results counterintuitive?

1. Heterogeneity of outcomes measures and interventions



Inability to pool data



No meta-analysis



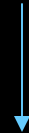
Small sample sizes



Insufficient power

# Why were the results counterintuitive?

2. Not all studies provided necessary data



Limited calculation of effect sizes

\* This resulted in exclusion of some studies in the analysis of the primary outcomes

# Why were the results counterintuitive?

## 3. Methodological limitations of included studies



No control for participants' concurrent medical treatment



Changes in participant outcomes from medical treatment or PT interventions?

# Deterioration in Coping Efficacy?

- Indicative findings for deterioration in coping efficacy from one **PERPT** study (Li 2006)

## WHY?

Increasing disease knowledge linked with changing expectations about prognosis<sup>31</sup>



Decrease in coping efficacy

# Findings for PERPT

- Discrepancy around disease knowledge for PERPT
  - Original studies found statistical significant improvements (Li et al 2006 & Bell et al 1998)
  - No significant results found in our effect size calculation

WHY?

# Reasons for Discrepancy

1. Type of statistical analysis used
  - Authors used change scores
  - We used point estimates
2. Sample size required to reach significance
  - Li et al (2006) used dichotomous variables
  - We used continuous measures

# Findings for ERPT

- Limited evidence found for use of ERPT to decrease pain
  - Chronic pain common in RA and is shown to increase over time<sup>26-28</sup>
  - Strong positive association between pain & depression<sup>29-30</sup>
  - Pain & depression can further increase personal suffering, health service utilization & societal costs<sup>29-30</sup>



# Findings for ERPT

- No evidence to support ERPT for improvement in functional ability due to conflicting results

Buljina 2001	O'Brien 2006
<u>Result:</u> Strong effect	<u>Result:</u> No effect
<u>Outcome Measure:</u> ADL scale	<u>Outcome Measure:</u> Jebsen-Taylor Hand Fxn Test & AIMS II subscales



# Limitations & Strengths of Included Studies

**L:** Small sample sizes → low power to detect clinically important differences

**S:** Majority of outcomes measures were reliable and valid → change can be attributed to intervention

# Limitations of Review

- Overestimation of quality of included studies → use of PEDro scale
- Language bias → only English articles
- Overestimation bias → potential unpublished negative studies
- Did not evaluate cost-effectiveness → possibly excluded studies that had clinical measures of HRQoL

# Strengths of Review

- External validity → interventions & outcome measures applicable to clinical practice<sup>32</sup>
- Internal validity → rigorous review process
- All RCTs → most reliable form of scientific evidence in healthcare<sup>33</sup>
- ICF → internationally recognized classification system & allows for comprehensive representation of RA patients' experiences

# IMPLICATIONS for RESEARCH



# What does future research need?

- This review limited by heterogeneity of interventions and outcome measures

We Recommend:

- 1) Core set of outcome measures that encompass all categories of ICF
- 2) Clear description of interventions including amount of rheumatology training

Increases possibility of a meta-analysis

# What does future research need?

- Length of interventions as well as presence and length of follow-ups varied among included studies

We Recommend:

3) Future studies conduct follow-up measurements and track participants for longer periods post-discharge

# CONCLUSION



Positive results were found for the effectiveness of **entry-level** rheumatology trained physiotherapy for the secondary outcomes, **key pinch strength** and **ability to perform moderate to intense physical activity**

Limited evidence was found for effectiveness of treatment provided by an **entry-level** rheumatology trained PT versus waitlist control for **reducing pain** in adults with RA



Results were found for the effectiveness of **post entry-level** trained physiotherapy in terms of **increased patient medication compliance** and **decreased coping efficacy**

**Inconclusive evidence** was found for the effectiveness of treatment provided by PTs with **post entry-level** rheumatology training for our primary outcomes

# Implications for Practice

- Evidence to support entry-level rheumatology trained PTs providing comprehensive physiotherapy
- Inconclusive evidence to support that PTs with additional training will produce better outcomes than PTs with entry-level training

# Acknowledgements

Linda Li

BSc(PT), MSc, PhD

Angela Busch

Dip (PT), BPT, MSc, PhD

Charlotte Beck

UBC Reference Librarian



# QUESTIONS ?



# References

1. Engel A, Roberts J, Burch TA. Rheumatoid arthritis in adults. *Vital Health Stat [1 ]* 1966; 11(17):1-43.
2. Lindquist B, Unsworth C. Occupational therapy-reflections on the state of the art. *WFOT-bulletin*. 1999;39:26-30.
3. Marra C. Rheumatoid arthritis: A primer for pharmacists. *Am J Health Syst Pharm*. 2006;63:S4-10.
4. Symmons DP, Barrett EM, Bankhead CR, Scott DG, Silman AJ. The incidence of rheumatoid arthritis in the united kingdom: Results from the norfolk arthritis register. *Br J Rheumatol*. 1994;33:735-739.
5. Vlieland TPMV. CARE: International conference on multidisciplinary care in rheumatoid arthritis. *International Journal of Advances in Rheumatology*. 2003;1:34–36
6. Brosseau L, Robinson V, Wells G, et al. Low level laser therapy (classes I, II and III) for treating rheumatoid arthritis. *Cochrane Database of Systematic Reviews*. 2008;1.
7. Brosseau L, Yonge KA, Robinson V, et al. Transcutaneous electrical nerve stimulation (TENS) for the treatment of rheumatoid arthritis in the hand. *Cochrane Database of Systematic Reviews*. 2008;1.
8. Cardoso JR, Athala AN, Cardoso APRG, et al. Aquatic therapy exercise for treating rheumatoid arthritis. *Cochrane Database of Systematic Reviews*. 2008;1
9. Casimiro L, Barnsley L, Brosseau L, et al. Acupuncture and electroacupuncture for the treatment of rheumatoid arthritis. *Cochrane Database of Systematic Reviews*. 2008;1.
10. Casimiro L, Brosseau L, Robinson V, et al. Therapeutic ultrasound for the treatment of rheumatoid arthritis. *Cochrane Database of Systematic Reviews*. 2008;1.
11. Pelland L, Brosseau L, Casimiro L, Robinson VA, Tugwell P, Wells G. Electrical stimulation for the treatment of rheumatoid arthritis. *Cochrane Database of Systematic Reviews*. 2008;1.
12. Riemsma RP, Kirwan JR, Taal E, Rasker JJ. Patient education for adults with rheumatoid arthritis. *Cochrane Database of Systematic Reviews*. 2008;1.
13. Robinson VA, Brosseau L, Casimiro L, et al. Thermotherapy for treating rheumatoid arthritis. *Cochrane Database of Systematic Reviews*. 2008;1.

14. Van den Ende CHM, Vliet Vlieland TPM, Munneke M, Hazes JMW. Dynamic exercise therapy for treating rheumatoid arthritis. *Cochrane Database of Systematic Reviews*. 2008;1.
15. van der Giesen F, Vliet vlieland TPM, Schoones JW, Brosseau L. Exercise therapy for the rheumatoid hand. *Cochrane Database of Systematic Reviews*. 2008;1.
16. Verhagen AP, BiermaZeinstra SMA, Boers M, et al. Balneotherapy for rheumatoid arthritis. *Cochrane Database of Systematic Reviews*. 2008;1.
17. Bell MJ, Lineker SC, Wilkins AL, Goldsmith CH, Badley EM. A randomized controlled trial to evaluate the efficacy of community based physical therapy in the treatment of people with rheumatoid arthritis. *J Rheumatol*. 1998;25:231-237.
18. Glazier R. Managing early presentation of rheumatoid arthritis. *Canadian Family Physician*. 1996;42:913-922.
19. Vliet Vlieland TP, Li LC, MacKay C, Badley EM. Does everybody need a team? *J Rheumatol*. 2006;33:1897-1899.
20. Cott CA, Boyle J, Fay J, Sutton D, Bowring J, Lineker S. Client-Centred Rehabilitation. 2001-03. 2001. Toronto, Arthritis Community Research & Evaluation Unit (ACREU).
21. Li, LC, Iverson MD. Outcomes of patients with rheumatoid arthritis receiving rehabilitation. *Curr.Opin.Rheumatol*. 2005;17:2 172-176
22. Maher CG, Sherrington C, Herbert RD, Moseley AM, Elkins M. Reliability of the PEDro scale for rating quality of randomized controlled trials. *Phys.Ther*. 2003;83:8 713
23. Scholten-Peeters , Verhagen AP, Bekkering GE, van der Windt DA, Barnsley L, Oostendorp RA, Hendriks EJ. Prognostic factors of whiplash-associated disorders: a systematic review of prospective cohort studies. *Pain* 2003;104:1-2 303-322
24. Li LC, MacKay C. CARE III Local Planning Committee. CARE III Online Patient Survey - Summary of Preliminary Analysis. Available at: [www.arthritis.ca/look%20at%20research/surveys/caresummary/default.asp?s=1](http://www.arthritis.ca/look%20at%20research/surveys/caresummary/default.asp?s=1). Accessed 07/15, 2008.
25. van Tulder MW, Cherkin DC, Berman B, Lao L, Koes BW. The effectiveness of acupuncture in the management of acute and chronic low back pain. A systematic review within the framework of the cochrane collaboration back review group. *Spine*. 1999;24:1113-1123.

26. Yelin E, Callahan LF. The economic cost and social and psychological impact of musculoskeletal conditions. national arthritis data work groups. *Arthritis Rheum.* 1995;38:1351-1362.
27. Felts W, Yelin E. The economic impact of the rheumatic diseases in the united states. *J Rheumatol.* 1989;16:867-884.
28. Gabriel SE, Crowson CS, Campion ME, O'Fallon WM. Indirect and nonmedical costs among people with rheumatoid arthritis and osteoarthritis compared with nonarthritic controls. *J Rheumatol.* 1997;24:43-48.
29. Turner JA, Romano JM. Self-report screening measures for depression in chronic pain patients. *J Clin Psychol.* 1984;40:909-913.
30. Kazis LE, Mcenan RF, Anderson JJ. Pain in the rheumatic diseases. *Arthritis and Rheumatism.* 1983;26:1017-1022.
31. Sprangers MA, Schwartz CE. Integrating response shift into health-related quality of life research: A theoretical model. *Soc Sci Med.* 1999;48:1507-1515.
32. Rothwell PM. External validity of randomised controlled trials: "to whom do the results of this trial apply?". *Lancet.* 2005;365:82-93.
33. Lachin JM. Randomization in clinical trials: Conclusions and recommendations. *Controlled clinical trials* [serial online]. 1988;9:365.