



Physical Fitness in Rice Farmers with Chronic Low Back Pain : A Cross-sectional Study

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Scope of presentation

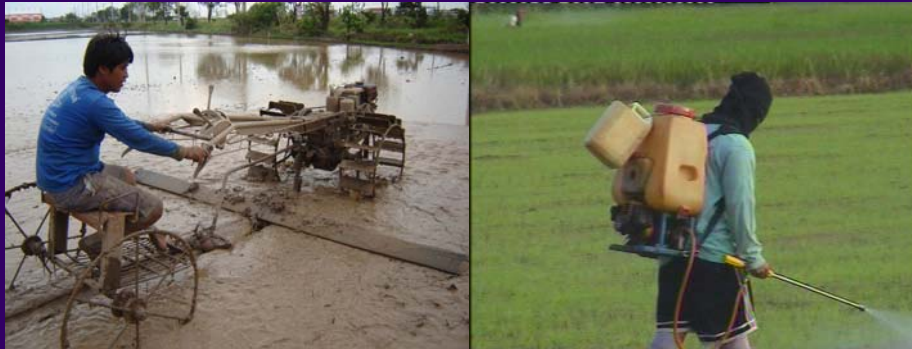
- Introduction
- Study Objective
- Methodology
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 - Data analysis
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Introduction

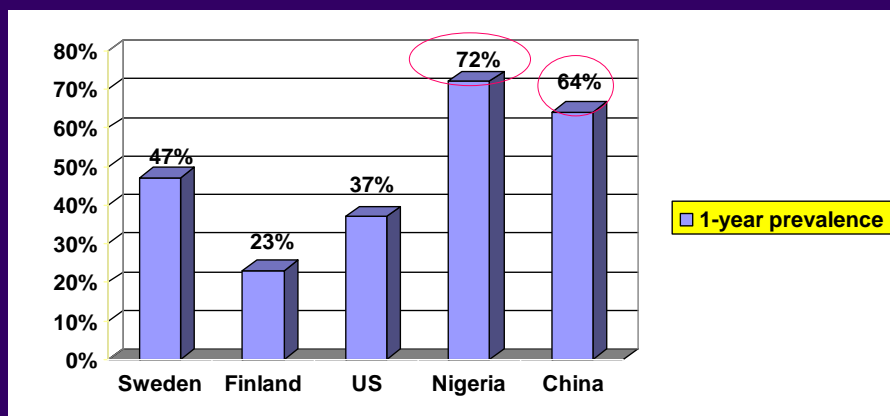
- Many studies reported high prevalent rates of low back pain (LBP) among farmer population.



(Fabunmi, 2006; Barrero, 2007) 3

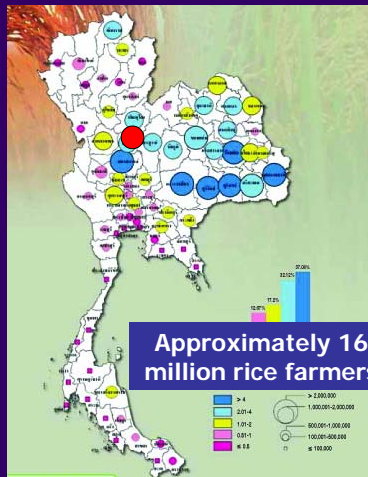


Introduction





Introduction



(Office of Agricultural Economic 2007/2008)

- In Thailand rice farmers are facing LBP problem.
- 49% for the point prevalence of LBP among rice farmers in Wangnamkhu sub-district, Phisanulok.

(Taechasubamorn, 2008)



Introduction

- LBP causes both disability and economic burden especially related to production losses.

(Andersson,1999; Wenig, 2008)

- In fact, most cost is consumed by the chronic low back pain (CLBP) patients (> 3 months).

(Krismer ans van Tulder, 2007)



Introduction :

Cost of LBP

Cost (US\$ Million)	Netherlands (% of total)	UK (% of total)	Sweden (% of total)	USA (% of total)
Direct cost	368 (7.4)	385 (11.5)	213 (8)	-
Indirect cost	4,600 (92.6)	2,948 (88.5)	2,262 (92)	-
Total cost	4,968 (100)	3,333 (100)	1,475 (100)	50,000 (100)

(Moffeh et al, 1995)

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Introduction

- How to develop treatment services and how to prevent acute LBP farmers from becoming chronic are challenged questions.
- To answer these questions, physical fitness in CLBP farmers needs to be investigated.

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The objective of this study

- To compare physical fitness batteries of rice farmers with CLBP and healthy farmers.
 - Body composition
 - Lifting capacity
 - Leg strength
 - Handgrip strength
 - Static back and abdominal endurance
 - Hamstrings flexibility
 - Posterior leg and back muscles flexibility
 - Abdominal flexibility

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Study design

- A comparative, cross-sectional study
- Matched pairs design on age and sex because previous studies revealed that sex and age might have an effect on physical fitness.

(Portney and Wilkin, 1993)

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Population & Sample

- Volunteered male and female rice farmers aged between 30 – 72 years who have been living in Wangnamkhu sub-district, Phitsanulok.
- Currently working on rice farm and growing at least 2 crops of rice per year for longer than one year.

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Inclusion criteria

- **For CLBP group**
 - Experiencing LBP for longer than 3 months.
 - Having pain score equal to or less than 5/10.
 - No radiating pain and numbness in legs.
- **For control group**
 - No LBP during the study periods.
 - No previous history of LBP or having a history of LBP in the past 1-2 years without any change in activities.

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Exclusion criteria

- Experiencing pain in other body parts
- Having blood pressure higher than 140/90 mmHg, heart diseases, asthma
- Having obvious abnormal posture such as scoliosis
- Experiencing significantly increased pain in low back during testing
- Refuse to continue the tests

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Reliability study

- 20 subjects with mean age of 27 ± 10.53 years.
 - 12 normal
 - 6 with current LBP
 - 2 had history of LBP
- They underwent 9 physical fitness tests.
- Each test was performed by a well-trained senior physiotherapy student.
- Each test was repeated by the same tester after 2 days.

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Nine physical fitness tests

- Percent body fat
- Lifting test
- Back extensor endurance test (ExtEn.)
- Leg strength test (Leg str.)
- Abdominal endurance test (AbdEn.)
- Handgrip strength test (Grip str.)
- Straight leg raise test (HamFI)
- Sit and reach test (Sit reach)
- Abdominal flexibility test (AbFI)

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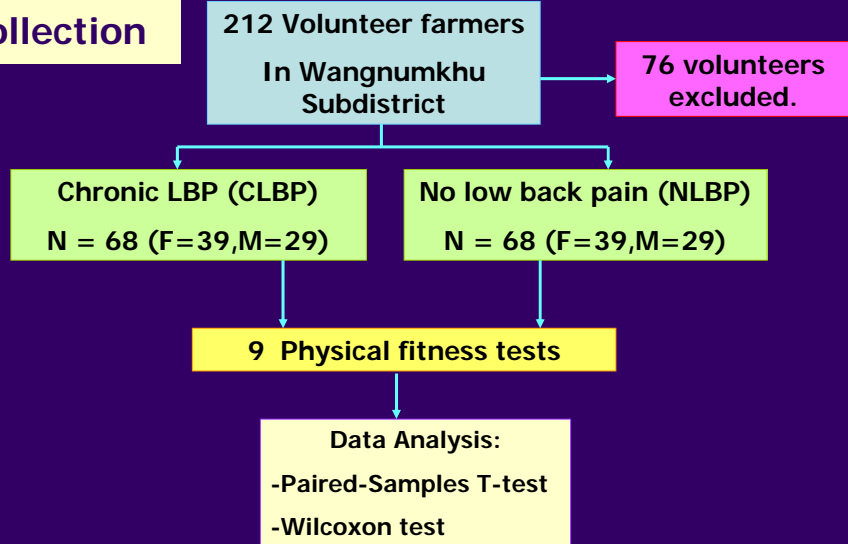
The ICCs of test-retest reliability

Physical fitness tests	N	ICC (1,1)
Percent body fat	20	0.99
Lifting test	20	0.97
Leg strength test	20	0.93
Handgrip strength	20	0.91
Static back endurance	20	0.94
Static abdominal endurance	20	0.98
Straight leg raise test	20	0.80
Sit and reach test	20	0.97
Abdominal flexibility test	20	0.91

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Data collection

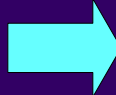


Body composition: Percent (%) body fat





Lifting test



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Static back extensor endurance (Modified Sorensen test)



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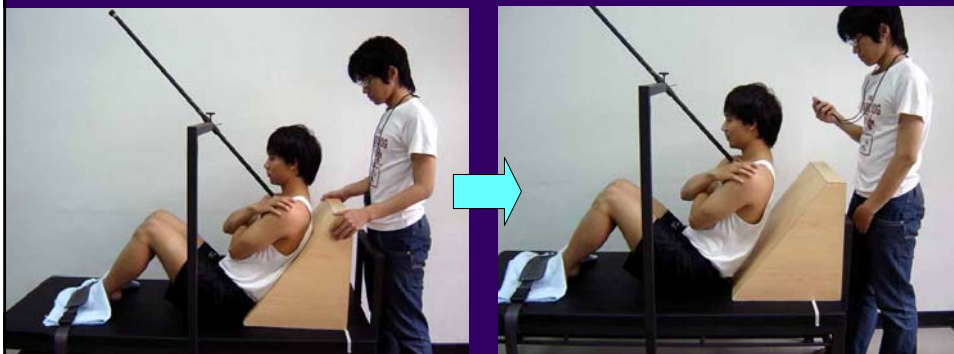
Leg strength test : Back-leg dynamometer



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Static abdominal endurance



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Handgrip strength test



Handgrip dynamometer



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Hamstrings flexibility: Straight leg raise test



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Posterior leg and back muscle flexibility: Sit and reach test



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Abdominal flexibility test: Backward fleximeter



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Data analysis

- using Komogorov-Sminov test to assess normal distribution.
- For normal distributed data, paired-samples t-test was used to compare the physical fitness values between CLBP group and NLBP group.
- If data did not distribute normally, the Wilcoxon test was used instead.

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Results

Characteristics	Mean \pm SD		P-value
	LBP gr. (n=68)	NLBP gr. (n=68)	
Age (yr.)	49.5 \pm 8.2	52.2 \pm 8.2	0.053
Wt. (kg.)	62.2 \pm 11.0	60.5 \pm 9.2	0.339
Ht. (m.)	1.6 \pm 0.1	1.6 \pm 0.1	0.196
BMI (kg/m ²)	25.1 \pm 4.0	24.0 \pm 3.4	0.072

Significant difference at P<0.05

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Results : Analysed by paired samples t-test

Physical fitness	Mean ± SD		P-value
	CLBP	NLBP	
% body fat	30.5 ± 9.7	28.0 ± 9.6	.130
Lifting cap. (Kg)	30.7 ± 11.6	32.4 ± 8.9	.328
Leg str.(Kg)	117.7 ± 41.1	120.2 ± 36.3	.699
Grip str. (Kg)	32.9 ± 9.0	33.1 ± 7.7	.888
AbdEn.(sec)	122.3 ± 58.2	107.7 ± 44.4	.103
HamFl.(dg)	90.4 ± 10.4	89.2 ± 8.2	.448
Sit.reach(cm)	16.9 ± 6.2	15.5 ± 6.9	.221
AbFl(cm)	34.0 ± 5.6	34.0 ± 6.4	.956

Significant difference at P<0.05

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Results : Analysed by Wilcoxon test

Physical fitness	Median (Q1, Q3)		P-value
	CLBP	NLBP	
BackEn (sec)	86.3 (66.0, 104.0)	102.7 (82.9, 120.7)	0.001*
Ab/Ext en.	1.3 (0.9, 1.8)	1.0 (0.7, 1.3)	0.001*

Significant difference at P<0.05

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Discussion

- Normally the back extensor endurance is higher than the trunk flexion endurance because they are anti-gravity muscles. (McGill, 2002, Taechasubamorn, 2003)
- This study obviously showed significant decreased back extensor endurance in the CLBP group.

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Discussion

- The flex/ext ratio of endurance being greater than 1 indicated imbalance which may be found in patients with CLBP (McGill, 2002).
- The results of this study is consistent with the results of McGill's study.
- The median of abdominal/back extensor endurance ratio in the CLBP group is equal to 1.3 which is higher than 1.0 of the control group.

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Conclusion

- Rice farmers with CLBP have lower extensor endurance times than those of normal farmers which may result in imbalance of trunk muscles.
- Measurements of trunk endurance times and their ratio are beneficial for evaluation and for training target in management of CLBP among rice farmers.
- Extensor endurance exercises should be added into treatment program for rice farmers with CLBP rather than flexion exercises.



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- Village health volunteers and rice farmers in Wangnamkhu, Phitsanulok



Reasons for exclusion

Reason	number
Pain in other body parts	22
Co-morbid; HT, Heart, etc.	20
Refuse to continue testing	10
Pain increased during testing	6
No longer active on farm	6
Pain less than 3 months	5
Severe abnormal posture	1
Cannot be matched	6
Total	76

Home

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