# EFFECTS OF LOW-INTENSITY PULSED ULTRASOUND ON PAIN AND RECOVERY OF RANGE OF MOTION AFTER TOTAL KNEE ARTHROPLASTY: PRELIMINARY STUDY

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## INTRODUCTION

- Pain and decreased knee mobility after total knee arthroplasty (TKA). (Vuorenmaa et al. 2008)
- Cryotherapy: the use of cryotherapy following TKA is still inconclusive. (Thacoor et al. 2018, Chughtai et al. 2017)
- Only one study: low-intensity pulsed ultrasound in combination with cryotherapy → relieve inflammation, improve range of motion (ROM) and joint function of patients with TKA. (Kang et al. 2014)



### Research questions

- In post-TKA patients, is the use of low-intensity pulsed ultrasound as an adjunct to conventional physiotherapy yields better outcomes on recovery of pain and knee ROM compared to conventional physiotherapy alone?
- Is there a relationship between the recovery of knee ROM and pain following the combined intervention?

# **METHODOLOGY**

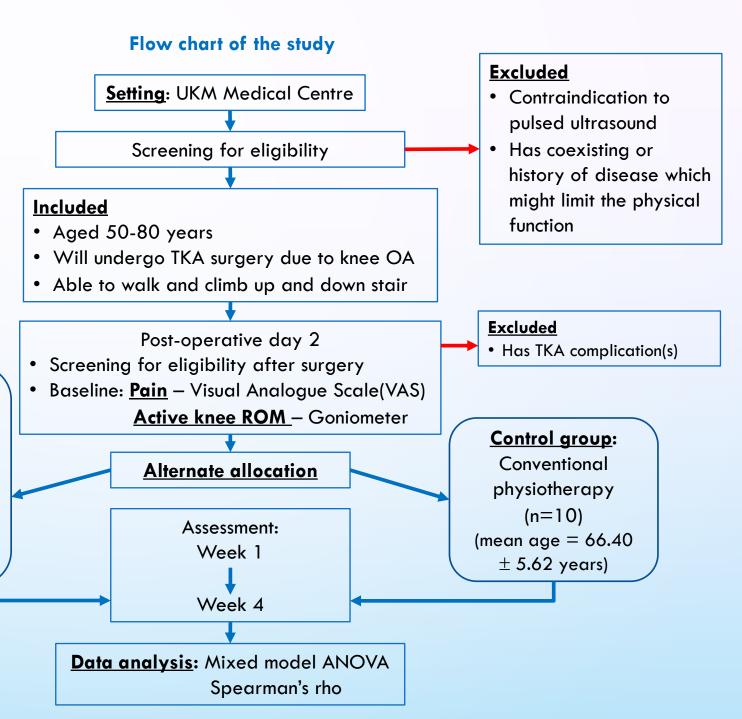
Study design:
Assessor-blinded
quasi-experimental
study

#### **Intervention**

- Pulsed-ultrasound: 3MHz, 1:4, 0.2 Wcm<sup>2</sup>, 5 min
  - First-week: 4 times
  - Further 2 weeks: 1x/week
- ☐ Conventional physiotherapy
  - First-week: 4 times
  - Further 3 weeks: 1x/week

#### **Experimental**

group: Pulsed
ultrasound-added
conventional
physiotherapy
years) (n=10)
(mean age = 66.40
± 9.14 years)



ţ	Outcome:		seline	Week 1		Week 4	P-value	
 He	Mean (SD)	(n=20)		(n=20)		(n=20)		
U U	Pain	4.25 (2.36)		3.80 (1.61)		2.77 (1.64)	0.042*	
Table 1: Time effect	Active knee	47.90 (20.36		75.52 (19.85)		96.08 (12.46)	0.000**	
라 드	flexion (°)							
Table 2: Group effect	Outcome: Mean (95% CI)		Experimental group (n=10)		Control group (n=10)			P-valu
	Pain 3		3.03 (2.22 – 3.83)		4.19 (3.38 – 4.99)		0.047	
Tab Gro	Active knee 80 flexion (°)		80.75 (72.6	80.75 (72.67 – 88.84)		65.59 (57.50 – 73.6		0.012
	Outcome: Baseline					Week 1		

# FINDINGS AND **DISCUSSION**

- Consistent with previous study by Kang et al. (2014) relating to ROM.
  - did not examine the effect of lowintensity pulsed ultrasound on pain.

\*P<0.05; \*\*P<0.001

	Outcome:	Baseline	Week 1			Week 4		
ction	Mean (SD)	Experimental (n=10)	Control (n=10)	Experimental (n=10)	Control (n=10)	Experimental (n=10)	Control (n=10)	P-value
era ect	Pain Active knee	4.00 (2.94)	4.50 (1.72)	3.20 (1.48)	4.40 (1.58)	1.88 (1.61)	3.66 (1.16)	0.452
Inte	Active knee flexion (°)	53.00 (17.19)	42.80 (22.84)	84.30 (19.56)	66.75 (16.66)	104.96 (9.91)	87.21(7.38)	0.611

Table 4: Correlation					
	Pain	P-value			
Active knee	-0.166	0.646			
flexion					

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Table

☐ Inconsistent with previous studies (Kocic et al. 2015 & Park et al. 2007)

• examined the relationship between ROM and pain but not on the effects of low-intensity pulsed ultrasound.

- Non-randomized control trial
- Small sample size

The combined intervention demonstrated more promising results in pain alleviation and recovery of knee motion following TKA.

Possible impact of the research outcome

Fills the gaps in knowledge relating the benefits of including pulsed ultrasound with low intensity into conventional physiotherapy for patients with TKA

Our results suggest low-intensity pulsed ultrasound as a possible adjunct modality to the acute physiotherapy management in enhancing the recovery following TKA.

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