

DOES TARGETED MUSCLE REINNERVATION (TMR) AND REGENERATIVE PERIPHERAL NERVE INTERFACE (RPNI) IMPROVE POST-AMPUTATION PAIN? A SYSTEMATIC REVIEW AND META-ANALYSIS

Elemosho Abdulaziz MD¹, Syed A Farhan MD¹, Muhammad M Nasir MBBS², Jude Kluemper BS¹,
Kerry-Ann Mitchell MD-PhD¹, Jason Souza MD¹

¹Ohio State University, Columbus, OH, USA, ²Dow University of Health Sciences, Karachi, Pakistan

INTRODUCTION:

More than 3 million people (about the population of Arkansas) in the US will have an amputated extremity by 2050, as per an estimate (1). Individuals with extremity amputation suffer from multi-faceted pain, which includes, but is not limited to, residual limb pain (RLP) and phantom limb pain (PLP) (2). Targeted muscle reinnervation (TMR), along with regenerative peripheral nerve interface, is a reconstructive technique that is effective in alleviating post-amputation pain and augment prosthesis function (2-5). This systematic review and meta-analysis aim to congregare the current evidence on TMR for post-amputation PLP and RLP.

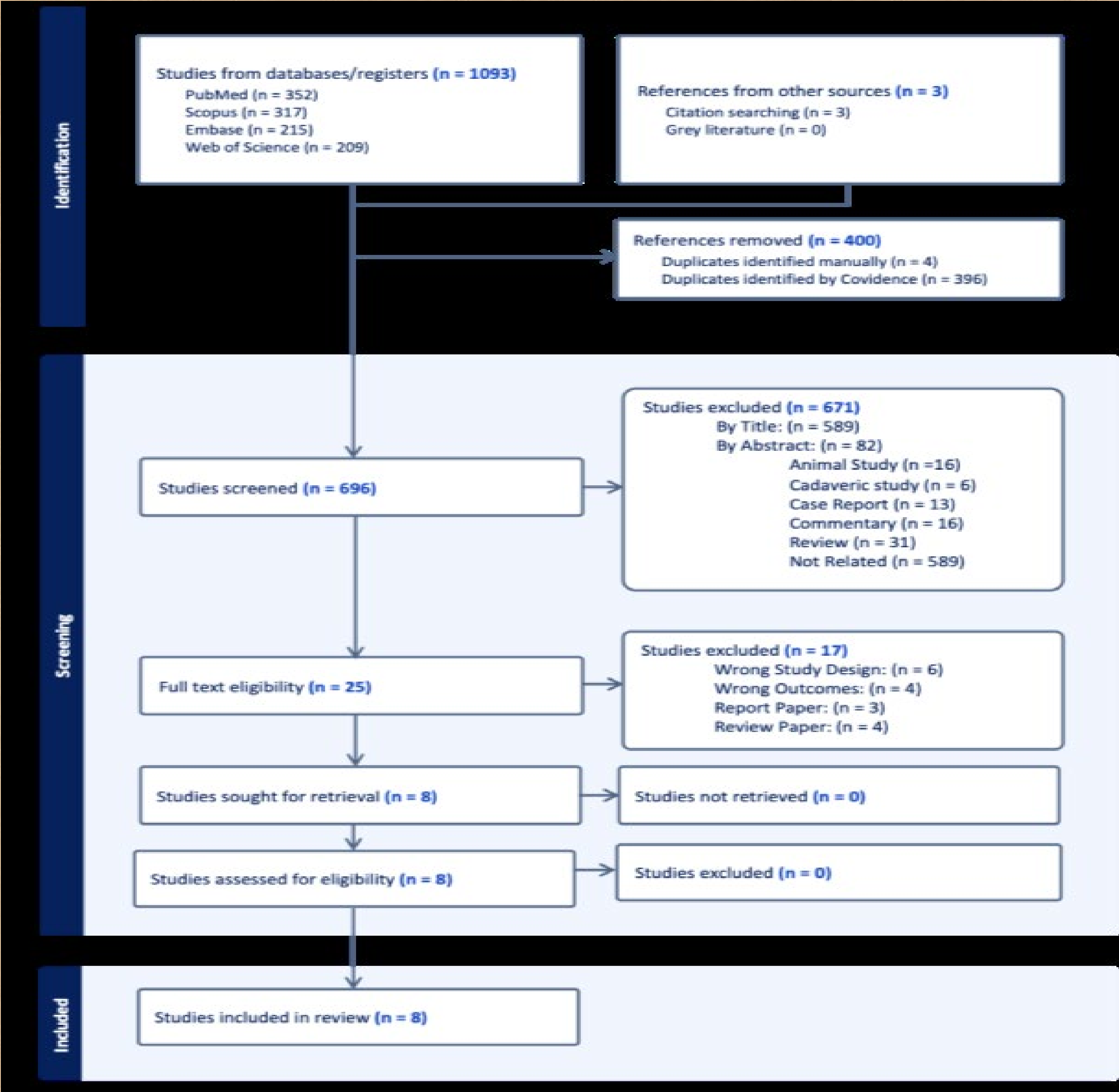
PURPOSE

The goal of this systematic review and meta-analysis was to aggregate the current evidence on TMR and/or RPNI for improving post- amputation Phantom Limb Pain (PLP) and Residual Limb Pain(RLP)

METHODS

Searching the five main databases including, extensive snowballing of all eligible articles was conducted. Different keywords and Boolean operators were used in our search strategy, considering different spellings and wordings. Articles comparing patients who had either TMR or RPNI before or at the time of their amputation, to those who had traditional amputation were included. Case series, reports, review articles and other systematic reviews and meta-analysis were excluded.

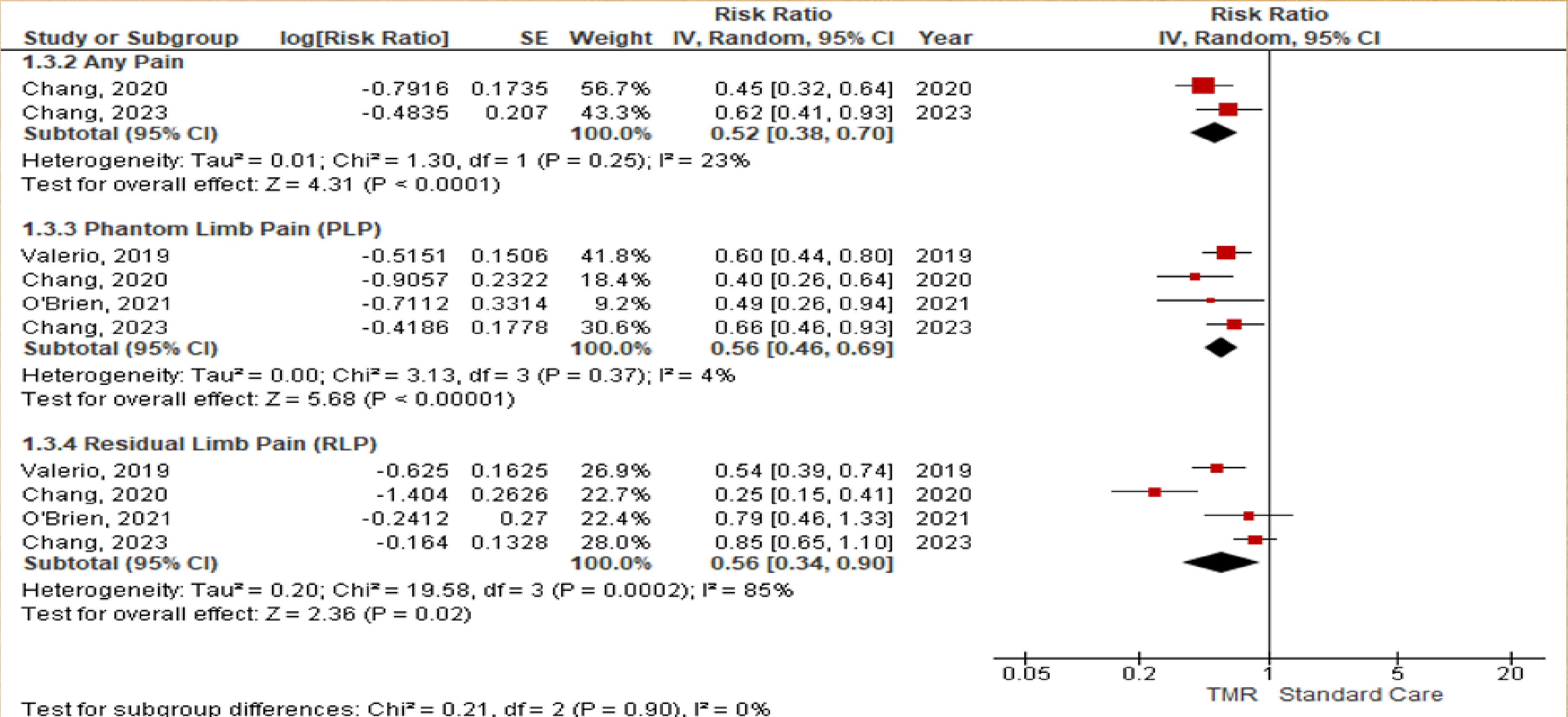
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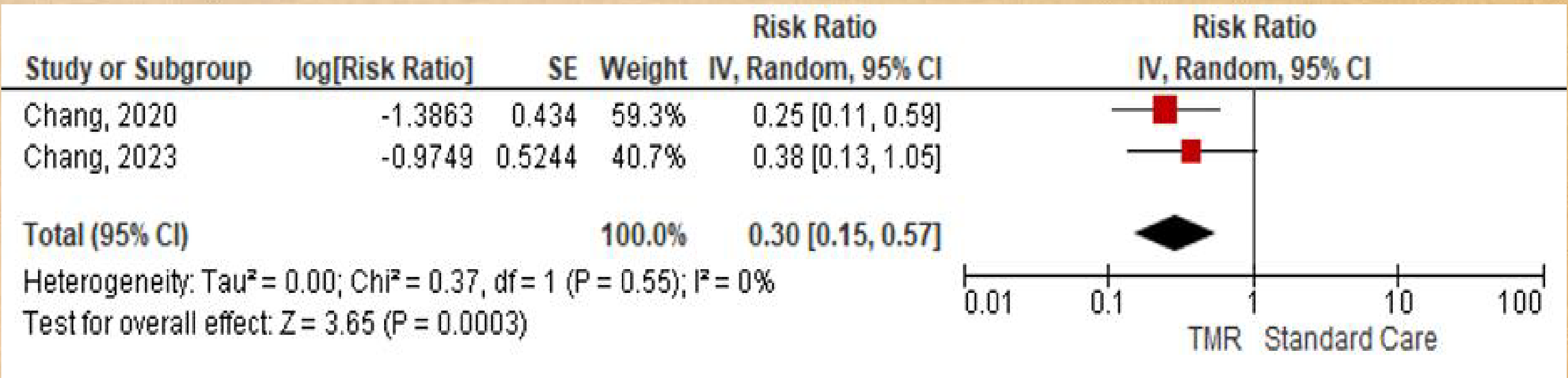
RESULTS

After removal of duplicate and irrelevant articles, eight studies were selected for qualitative review, and six for quantitative review with a total of 972 patients. Pooled analysis revealed that TMR when compared to standardized care showed significant reduction in any type of pain (RR: 0.52 (95% CI: 0.38, 0.70) P<0.0001, I² = 23%), phantom limb pain (PLP) (RR: 0.56 (95% CI: 0.46,0.69) P<0.00001, I² = 4%), and residual limb pain (RLP) (RR: 0.56 (95% CI: 0.34, 0.90) P=0.02, I²=85%). Moreover, TMR also demonstrated significant reduction in usage of narcotic post-operatively (RR: 0.30 (95% CI: 0.15, 0.57) P=0.0003, I² =0%).

Differences in post-amputation pain between TMR and Standard Care groups



Narcotics usage post-operatively between either treatment groups



CONCLUSIONS

This study concludes that TMR and RPNI significantly decreases PLP, RLP, and subsequently narcotics in the post-amputation setting when compared to standard care.

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