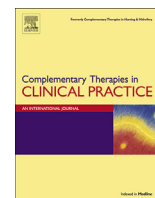




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## TENS and heat therapy for pain relief and quality of life improvement in individuals with primary dysmenorrhea: A systematic review



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### ABSTRACT

The present systematic review aimed to synthesize evidence for the effectiveness of TENS and heat therapy interventions from randomized trials. Six relevant databases were searched for studies on TENS and heat therapy for primary dysmenorrhea. Menstrual pain intensity and quality of life were the primary and secondary outcomes respectively. The search yielded 46 citations from which six studies on TENS and three studies on heat therapy were systematically reviewed. On the PEDRO quality scale, the trials methodological quality was 4.8 out of 10 for TENS and 6.3 out of 10 for heat therapy. TENS and heat therapy both showed evidence of pain reduction, but no study included quality of life as an outcome. Meta-analysis was not possible due to substantial heterogeneity in included studies. TENS and heat therapy show potential as adjunct remedies in the management of primary dysmenorrhea, but rigorous high quality trials are still needed to made conclusive recommendation.

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## 1. Background of study

Primary dysmenorrhea (pain during menses in absence of underlying pathology), constitutes a high health, social and economic burden. Absenteeism from school or work at least once sequel to the symptoms of primary dysmenorrhea has been reported as between one third to half, with 5%–14% of these absenteeism occurring frequently [1]. Non-steroidal anti-inflammatory medications (NSAID), and oral contraceptive pills are primary choice for routine relieve of pain primary dysmenorrheal [2]. However, these have side-effects in some individuals [3], many individual do not get pain relief from these choice interventions.

Therefore effective alternative therapy for primary dysmenorrhea that have minimal side effect is of potential value. Among these alternative are heat therapy and transcutaneous electrical nerve stimulation (TENS). TENS is belief to effect relief of primary dysmenorrheal pain by three mechanisms. First is by gating afferent ascending pain signal at the spinal cord [4]. The second is the release of endogenous morphine for onward delivery through descending efferent fibre [5,6]. Lastly, TENS is believed to reduces uterine muscle ischemia via enhanced corresponding skin perfusion brought about by local vasodilation in the same dermatome area after skin stimulation with TENS [7].

TENS and heat interventions have been advocated as a major non-medical intervention for the relief of dysmenorrhea [8,9]. However, there is conflicting evidence regarding the main issue of how the different interventions are beneficial. The major challenge in translating research evidence to clinical guideline for regarding utilization of TENS and heat therapy for primary dysmenorrheal has heterogeneity of the different protocols, doses and contradicting finding from different trials. A systematic review is warranted to aggregate available research literature into a high quality evidence translatable a clinical guideline for or against the routine use of heath and TENS treatment as an adjust therapy for individuals with to primary dysmenorrhea. The objective of this systematic review is to investigate the effect of heath and TENS in pain relief and quality of life improvement in individuals with primary dysmenorrheal via review of RCTs.

## 2. Methods

**Research design:** This is a systematic review of outcome and quality of various trials on TENS and heat therapy in pain relief and quality of life of females with primary dysmenorrhea.

**Source of data:** A comprehensive search strategy was conducted on Ovid Medline, Science Direct, PEDro, CINAHL, PsycINFO, and AMED were searched. The search was performed using the following key indexing terms independently; 'TENS', 'Electrical stimulation', 'primary dsymenorrhea', 'TENS therapy', 'heat therapy', 'hot water bottle therapy', 'infra-red therapy', 'physiotherapy', 'primary dsymenorrhea' 'quality of life', 'physical intervention'. The literature was searched until October 2015.

### 2.1. Selection criteria

Studies with the main focus on the efficacy, effectiveness, or effect of different heat therapy and TENS modalities used for primary dysmenorrhea were included. Limiters include peer

review journal or conference publications on human participants published in English language. All study abstracts meeting these broad criteria were initially included. In the case that decision could not be made based on the title and abstract of the paper, the authors were contacted for any missing data in the included studies and the full text of the paper was included for further decision.

Subsequent inclusion, based on the inclusion criteria was then assessed independently by two review authors. When a difference of opinion occurred, consensus was reached on inclusion or exclusion by discussion and reflection, or in consultation with a third review author.

The following inclusion criteria determined eligibility for the trials that were included in the review: primary dysmenorrhea (pain affecting daily activity or with a high baseline score  $\geq 3$  on VAS or equivalent tool); Primary dysmenorrhea in the majority (>50%) of menstrual cycles; Primary dysmenorrhea for at least one day of menses. Studies were excluded if participants had irregular or infrequent menstrual cycles (usually outside of the typical range of a 21–35 day cycle); using an intra-uterine contraceptive device (IUD), report of usage of oral contraceptive pills (OCP).

**Outcomes:** The primary outcome was pain intensity. Secondary outcome was quality of life. Any pain intensity outcome measure tool was included in as much as it can easily convert to 1–10 on VAS. Only validated QoL outcome measurement tool was eligible.

### 2.2. Data extraction and management

Data extraction was independently completed by the last two review authors, later harmonized by discussion and reflection where there were differences between the two. Because prior standardization of the data extraction procedures was required for consistency in method used by both review authors, a trial was conducted on two similar papers not related to the present review topic. The result of the extraction was then discussed until procedure was clear. The first author was consulted when there were agreement could not be reach between the last two authors on data items. First author's opinion stimulated further discussion to arrive at a consensus. This data extraction method (double data extraction) has been shown to have a lower rate of error than simple data extraction [10]. Pooling of data was undertaken where adequate homogeneity of results existed. Discrepancies were resolved by discussion. For each included trial, data were extracted regarding the participants (age range, eligibility criteria), the nature of the interventions, and data relating to the outcomes of pain intensity and quality of life.

**Data extraction form:** This form consists of descriptive characteristics (see Table 1) and a quality appraisal tool (see Table 3). Data was extracted based on the elements of this form which are related to the research questions and aims of this systematic review.

**Quality appraisal:** The quality of paper was assessed using the PEDro quality appraisal tool. Answers to the quality appraisal items were defined as Yes, No, Not applicable or Unclear. A score of one was given to each yes answer and zero to no, unclear and not applicable (N/A) answers. The overall score was reported as a tally of all yes answers out of 10 based on the applicable answers for each study. Scores of individual item from the critical appraisal tool were added to present a total score.

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