The Use Of Phototherapy In The Treatment Of Tendinopathy: Physiotherapist Experiences And Practices In Jordan


Abstract— Physiotherapists play a key role as healthcare providers directly involved with patients. A successful physiotherapy treatment is dependent on both patient and physiotherapist. Light-based therapy (phototherapy) is now used as a treatment modality in musculoskeletal disorders such as tendinopathy. Little is known about the use of phototherapy as a treatment modality in Jordan. In this study, semi-structured interviews were employed addressing the practices and experiences of practicing Jordanian physiotherapist regarding phototherapy use with emphasis on tendinopathy. Thematic analysis of collected data revealed three major themes including; knowledge and skills, trustiness of phototherapy and barriers in using phototherapy. Findings showed a generally limited basic knowledge and practical skills at pre- and post-graduation especially in public sector. A trustiness issue regarding effectiveness and acceptability of phototherapy (i.e. device and light) by most physiotherapists and the competition of other modalities such as hot packs and interferential therapy. Principal barriers regarding light therapy devices were availability, knowledge and tangibility which was obvious in public sector. This study recommends the integration of phototherapy as theoretical topics and practical training programs into the undergraduate curricula of physiotherapy and suggest workshops and scientific research projects as part of continuous learning programs in physiotherapist settings to increase the awareness of phototherapy as potential treatment modality.

Index Terms— Tendinopathy; Physiotherapy; Phototherapy; Qualitative Interviews

INTRODUCTION

Incidence of tendon disorders associated most commonly with the Achilles, patellar, hand extensors and rotator cuff tendons has increased in recent years (Min et al., 2013)(Alfredson, 2005, Franchi et al., 2007). Tendinopathy is a significant cause of pain and disability consequently has a high financial cost and time both to the patient and the health service, in addition, no single treatment will heal all conditions completely. So, these are driving factors in developing treatment modality (Bjur et al., 2005, Re es et al., 2009, Warden and Scott, 2011).Conservative treatment modalities are considered as the primary treatment choice for tendinopathy, as they have the advantage of being effective and of low cost with minimal complications (Ackermann and Renstrom, 2012). It includes physical, chemical, biological, or a combination of modalities (Alfredson and Lorentzon, 2000, Kampa and Connell, 2010, Skjong et al., 2012). Physically based treatments encompass a wide range of options, such as eccentric exercise, ultrasound therapy, light-based therapy (phototherapy), hyperthermia and extracorporeal shock wave therapy, functional electrical stimulation, heat, and aquatic therapy (hydrotherapy) (Andres and Murrell, 2008, De Vos et al., 2010, Sharma and Maffulli, 2005).

Eccentric exercise remains the preferred conservative first choice, either singly or in combination with other treatments, such as light therapy or hydrotherapy and ultrasound therapy (Tumility et al., 2010).

Jihad A. M. Alzyoud, Assistant Professor. Faculty of Applied Health Sciences. The Hashemite University
Taghreed Muharib, Lab Technician. Faculty of Applied Health Sciences. The Hashemite University
Light-based therapy (phototherapy) is now widely used for conservative and non-conservative (invasive) treatment modalities in several medical conditions such as, ophthalmic, vascular, dermatological and musculoskeletal disorders (e.g. tendinopathy) (Eenwemeka and Reddy, 2000, Iacopetti et al., 2015, Mang, 2004, Mester et al., 1971).

A successful physiotherapy treatment is dependent on both the physiotherapist and the patient and the choice of treatment modality (Praestegaard et al., 2011). Physiotherapists play a key role as part of the healthcare providers as practitioners directly involved with patients, in addition to their educational role and involvement in scientific research and public health programs (Ohtake, 2010). No studies have been retrieved addressing the practices and experiences of physiotherapist in Jordan regarding the use of phototherapy as a treatment option.

This study aimed at shedding the light on the experiences and practices of Jordanian physical therapists working in the field of physical therapy regarding the use of phototherapy devices for the treatment of musculoskeletal disorders with especial emphasis on tendinopathy with the overriding aim of improving healthcare outcomes. Secondary aims, include identify what is the most common conditions
encountered, what devices available, and what barriers faced by physiotherapies

**METHODOLOGY**

A qualitative approach employing a semi-structured interview (open-ended questions) using a purposive convenience sample recruited from a population consisted of all practicing physical therapist in Jordan health sectors (i.e. private and public (including military royal services)) with at least one year of experiences. Demographic features questionnaire and signed informed consent were collected from participants at time of interview. Interview records and note taking were employed to collect data. A pilot study was conducted, to ensure credibility and avoid bias in data collection and analysis, involving one physiotherapy who fits the criteria (not included in the main study) and it was to optimize the main interview process.

**DATA ANALYSIS**

Interviews records were translated into written text verbatim. Data collected (Translated records and written notes) were analyzed using a thematic analysis method (Braun and Clarke, 2006, Krueger and Casey, 2009, Onwuegbuzie and Leech, 2007). A systematic coding process were used to identify patterns in the collected data for each participant, then similar patterns were allocated into major category. All participants data were thematically analyzed and emerged categories were compared and linked together. This research study was carried out with approval from the Hashemite University institutional review board (IRB). All participants signed informed consent at their departments. Confidentiality, anonymity, privacy and security of data were maintained throughout the study. All data will be kept safe for five years at PI office.

**RESULTS**

Demographic features among all participants showed a total of twenty-one physiotherapists were interviewed, nine females and twelve males. The average age of participants was 33 years (25 – 50) and the average work experience was 10 years (2 – 30). All participants hold bachelor degree and 57% of them are males. Three work settings were involved, ministry of health, royal medical services and private health sector (Table 1).

**Findings**

Thematic analysis findings have revealed three main themes; knowledge and skills, trustiness of phototherapy and barriers of phototherapy (Figure 1). Summary of extracted data were presented in table 2, 3 and 4.

**Theme I: Knowledge and Skills**

**Subtheme 1: Phototherapy knowledge (Pre/Post graduation)**

Most physiotherapist expressed their limited knowledge in phototherapy during their university educations. There were no specific courses designed for light therapy in their curricula. Their knowledge is stemmed from their practical training period where they exposed to infrared device and later acquired knowledge regarding the use, instructions, and settings from senior physiotherapist

P2: ‘during our undergraduate study, little was told about light therapy and devices in physical therapy courses.

**Subtheme 2: Phototherapy skills (Pre/Post graduation)**

Physiotherapist skills is also similar to their knowledge as most of them did not have the chance to use it during their education and acquired skills were built upon senior physiotherapist

P9: ‘A senior physiotherapist teaches me how to use infrared and give me the instructions.

**Theme II: Trustiness of phototherapy**

**Subtheme 1: Phototherapy as a modality**

Most physiotherapist look at phototherapy as a source of heat and enhance circulation and think as an alternative rather than indicatable. If present would combine with physical therapy. Another important factor influence phototherapy is the patients.

P1: ‘we use infrared for muscle pain and ultraviolet for vascular lesions’

**Subtheme 2: Safety of modality**

Some physiotherapist was worry regarding the safety measures especially when using laser

P13: 'Laser is dangerous and some patients would show fear”

**Subtheme 3: Evidence and Tangibility**

There was a undesirable perception regarding the use of light therapy and its effectiveness in MS conditions and this was driven by the lack of a tangible feeling of the treatment by both physiotherapy and patients compared to other

P1: ‘during Infrared treatments there is no tangible feeling of the treatment by both

**Theme III: barriers**

**Subtheme 1: Optical device availability**

The most common barrier is the unavailability of optical devices which was restricted to infrared devices in public sectors and limited devices were seen in military and private. Secondly, interest in private settings is more than public. Some physiotherapists were reluctant in using available phototherapy device due to fear of safety and lack of knowledge.
P3: ‘we have only infrared’
P11: I used both infrared and laser device for treatment’

**Subtheme 3: Referral process / Mixed role**

The process of referral is varying between different health care systems, private sectors allow the physiotherapist evaluates the clinically diagnosed case and put the plan while public settings including royal military medical services require a referral form signed by a physician including details of treatment plan. This mixed system influences its use.
P18: ‘physicians diagnose and send us physical treatments and they indicate the name of treatment. We do complete evaluation and put treatment plan with patients.

**Subtheme 2: Competing other modalities**

Several factors influence the choice of phototherapy over comparable alternative modalities most importantly, nature of the case, patient’s perception of light, and safety measure.

**DISCUSSION**

The power of the study was determined by the number of participants which was chosen to be 30, however, in this study only twenty-one physiotherapists were interviewed because a saturation level was reached and a redundancy is achieved at which no new information could be mined and this was in accordance with published literature (Guest et al., 2006). Different treatment methods were seen in physical therapy clinics which include, physical exercise, electrical stimulation, diathermy, ultrasound, manual therapy, wax and light-based therapy such as infrared and laser devices. In addition, a spectrum of musculoskeletal conditions were treated including, low back pain, shoulder pain, knee pain and postoperative surgery (Table 2). Findings suggest that physiotherapist experiences and practices in Jordan were influenced by several factors including; clinic type (public vs. private), education, work duration and work environment.

This study identifies that phototherapy as part of the physical treatment options in clinics is limited in use and this was attributed to barriers which includes, limited knowledge and skill during study and at work, unavailability of light devices, alternative treatment options and governance. Sedláčková and Ryan (2016) stresses the importance of practical education in preparing the physiotherapist. All participants have an experience with at least one phototherapy device. Experiences were seen when they have opportunity to practice using light devices and lack of devices made responses reluctant and rely merely on senior physiotherapist experiences (if any). Also their perception was influenced by nature of the treatment as lack of a physical feeling (tangible) during light treatment. In addition, the responses were always influences by comparisons with other alternative physical modalities such as ultrasound, hot packs or electrical stimulation. These findings are comparable with findings reported by Nuhu et al (2014) regarding the perceptions of physiotherapists on using ultraviolet light as a treatment modalities in respect to barriers facing phototherapy.

In general, participants express a cautious attitude and trustiness about the use and efficiency of light devices (if present). Importantly, most of the physiotherapist built their attitudes and views based on the use of single light device (infrared and to lesser extent on laser) or transferred from senior physiotherapists whom experience was based on similar devices. Some of the physiotherapist were concern regarding the safety of light devices such as skin burns and eye safety. Another important issue regarding the use of phototherapy was the influence of patient’s related factors in treatment decision making which was evidence by most physiotherapist such as fear of patients, lack of physical feeling and culture and education. Referral system is important factor that can be an enhancing factor in the use of phototherapy which needs cooperation between physiotherapist and physicians. This finding is comparable with results of Rush and Shore (1994) in survey study regarding the perceptions of physicians on different treatment modalities including light therapy which stresses the important of cooperation between physiotherapist and physicians.

**CONCLUSIONS, LIMITATIONS AND RECOMMENDATIONS**

This study revealed experiences and practices of physiotherapist in Jordanian settings. Findings of the study suggest a limited knowledge and training regard phototherapy (light-based therapeutic devices) which is reflected by the limited number of light devices and unfavorable perspective. Integrating phototherapy and light-based devices in the learning material of the student’s curricula and emphasizing phototherapy as a modality in physiotherapist clinics by providing light devices and a training program would modify this perspective. Further research is suggested which could increase the recognition of phototherapy in physiotherapy.

In thematic analysis, representation of the sample may be a limiting factor. Another factor is the geographic area is limited to Amman and Zarqa. Including other areas would be more representative, although it may not reveal any new data since apart from Amman, other cities would not differ.
noticeably. Data were analyzed by a single researcher which would limit the independent ability of analysis, however, because of the researcher is not a physiotherapist the effect is limited. This study recommends the integration of phototherapy as theoretical topics and practical training programs into the undergraduate curricula of physiotherapy and suggest workshops and scientific research projects as part of continuous learning programs in physiotherapist settings to increase the awareness of phototherapy as treatment modality.

Table 1: Demographic features of participants

<table>
<thead>
<tr>
<th>Participant</th>
<th>Age</th>
<th>Gender</th>
<th>Education</th>
<th>Experience years</th>
<th>Practice place</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>35</td>
<td>F</td>
<td>Bachelor</td>
<td>11</td>
<td>Royal services</td>
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<tr>
<td>2</td>
<td>50</td>
<td>M</td>
<td>Bachelor</td>
<td>30</td>
<td>Private</td>
</tr>
<tr>
<td>3</td>
<td>30</td>
<td>M</td>
<td>Bachelor</td>
<td>8</td>
<td>Private</td>
</tr>
<tr>
<td>4</td>
<td>35</td>
<td>F</td>
<td>Bachelor</td>
<td>12</td>
<td>Royal services</td>
</tr>
<tr>
<td>5</td>
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<td>F</td>
<td>Bachelor</td>
<td>6</td>
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</tr>
<tr>
<td>6</td>
<td>35</td>
<td>F</td>
<td>Bachelor</td>
<td>11</td>
<td>Royal services</td>
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<tr>
<td>7</td>
<td>36</td>
<td>M</td>
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<tr>
<td>12</td>
<td>25</td>
<td>M</td>
<td>Bachelor</td>
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<td>Private</td>
</tr>
<tr>
<td>Total</td>
<td>33</td>
<td>F/M = 9/12</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

Wax therapy | Sport injuries (ACL, Achilles)
Diathermy | Temporomandibular Joint pain
hydrotherapy | Low Back Pain
Infrared / LASER | Facial Palsy
Physical Exercise | Postoperative

TABLE 2: DISTRIBUTION OF PHYSIOTHERAPIST BASED IN TYPE OF LIGHT DEVICES USED PER CLINIC PLACE

<table>
<thead>
<tr>
<th>Clinic Place</th>
<th>Number of Physiotherapist</th>
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<tbody>
<tr>
<td></td>
<td>Infrared</td>
</tr>
<tr>
<td>Royal services</td>
<td>6</td>
</tr>
<tr>
<td>Private</td>
<td>10</td>
</tr>
<tr>
<td>Public</td>
<td>5</td>
</tr>
<tr>
<td>Total</td>
<td>21</td>
</tr>
</tbody>
</table>

TABLE 3: A LIST OF COMMON CONDITIONS AT CLINICS AND DIFFERENT TREATMENT OPTIONS

<table>
<thead>
<tr>
<th>Common treatments options</th>
<th>Common conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manual Therapy</td>
<td>Rotator Cuff</td>
</tr>
<tr>
<td>Electrical Stimulation</td>
<td>Cervical spondylosis</td>
</tr>
<tr>
<td>Hot / Cold packs</td>
<td>Cerebrovascular accident CVA</td>
</tr>
</tbody>
</table>

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REFERENCES

Tendinosis. Sports Medicine, 29, 135-146.


