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Professional issue

# Manual therapy: Exploiting the role of human touch

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A B S T R A C T

*Introduction:* The physiotherapy approach to musculoskeletal pain is currently pointing more towards a hands-off management of patients by education and exercise therapy. However, hands-on techniques still represent a core element of musculoskeletal physiotherapy practice appreciated by patients and widely taught in educational program and clinical professional development training.

*Purpose:* This professional issue explain why hands-on techniques may be considered a specific form of touch and outlines the importance of having a deep and wider understanding of their action mechanisms. Three aspects of the human touch, namely analgesic, affective and somatoperceptual are considered in light of the current literature.

*Implications:* The view of hands-on techniques as a specific form of human touch implies a change of perspective. Primarily, manual therapy techniques are based on the physical properties of the delivered stimulus (requiring knowledge of anatomy, biomechanics and neurophysiology) as well as on the emotional properties that emerge from the sympathetic contact established with the patient. Secondarily, the manual therapists should develop relationship and communicative skills allowing this kind of touch to emerge. Thirdly, accordingly with this new perspective, the study of the multifaceted mechanisms of action of hands-on techniques requires a multidisciplinary team of researchers including specialists apparently far from the clinical field. Finally, the recognition of the therapeutic value of touch as one of the most qualifying professional acts of physiotherapists is needed and guarantees patients of its best evidence-based delivering.

## 1. Introduction

According to a bio-psychosocial framework suggesting that lifestyle and psychosocial factors are among the strongest barriers to recovery after musculoskeletal diseases (Vargas-Prada and Coggon, 2015), patient's education and exercise therapy are currently proposed as recommended evidence-based interventions (Lin et al., 2019), while passive treatments are considered by some to be out-of-date to address the complexity of musculoskeletal disorders. Meanwhile, the benefit of passive treatment observed in clinical practice has posed the question about why these techniques are helpful as a growing body of literature has questioned the constructs that explain the operating mechanism of hands-on techniques (Bialosky et al., 2017).

A large amount of evidence has identified hands-on techniques as a pain modulator playing a role at multiple levels beyond biomechanics that represents only one of the possible explanations of action (e.g., change in spinal stiffness) (Zusman, 2010). Different interpretative frameworks have been proposed to better clarify the mechanism of action of manual techniques (Bialosky et al., 2009; Testa and Rossettini, 2016). The elicitation of neurophysiological effects (e.g., spinal reflex and pain neural networks modulation) and context-related effects (e.g., placebo, nocebo) provide additional interpretations to explain why somatosensory stimuli delivered during the application of a manual technique are capable to modulate the patient's processing of pain condition (Bialosky et al., 2018; Rossettini et al., 2018).

This change of perspective has stimulated a debate among scholars on the role of hands-on techniques (Collins et al., 2017; Karas et al., 2018; Mintken et al., 2018; Oostendorp, 2018; Reid et al., 2017), resulting in two major reflections. As an opportunity, it has increased the awareness of the value of this treatment solution as effective to improve pain, function and to facilitate pain-free movement without 'fixing' or 'cure' any structural deficits (Lewis and O'Sullivan, 2018). As a pitfall, it has left a sense of loss among clinicians and teachers involved in orthopaedic manual therapy, thus considering the possibility to decrease the effort of teaching them or to abandon the techniques from their therapeutic toolbox in favour of active and psychological strategies (e.g., change of lifestyle, exercise therapy, pain education) (Rabey et al., 2017).

Even though we are mature enough to accept a transformation of our heritage as a sign of professional development, we have to recognize that hands-on techniques are a core element of physiotherapy identity (Nicholls and Holmes, 2012) appreciated and expected by patients in the context of a therapeutic ritual historically founded on the use of touch (Rutberg et al., 2013). During the clinical encounter, physiotherapists use their hands to: offer care, obtain information about the patient's complaints during the physical examination, prepare the

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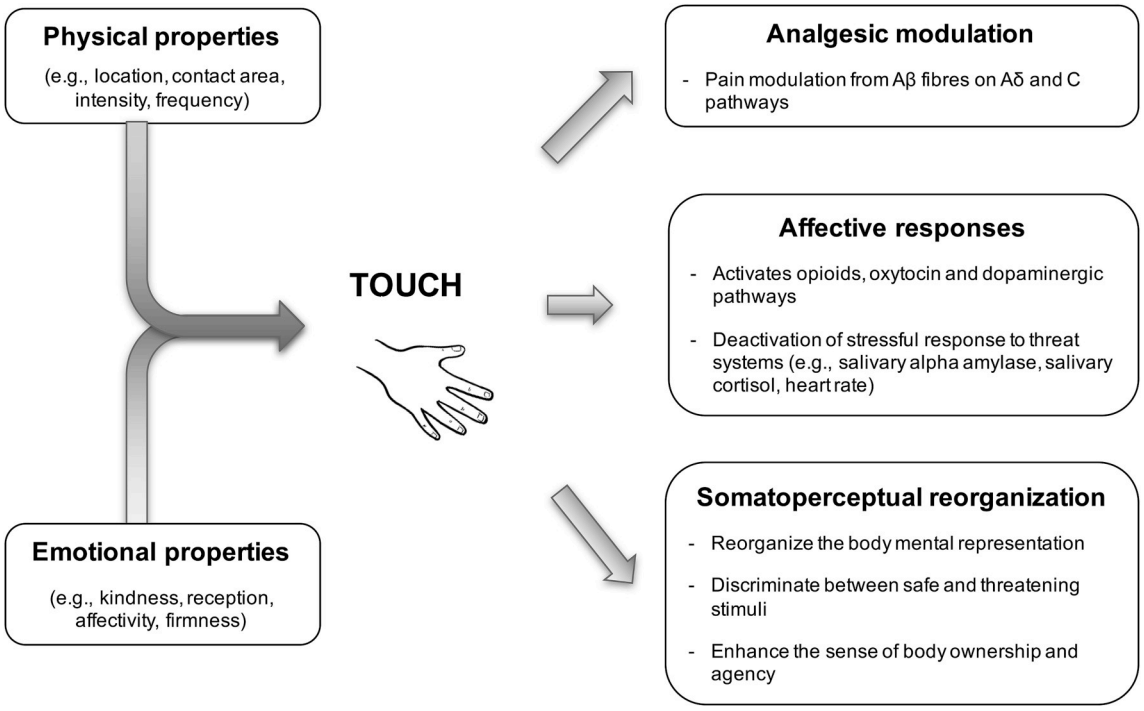


**Fig. 1.** The semantic of touch is characterized by the physical and emotional properties of the applied stimulus. The physical properties encompass the deep knowledge of anatomy and biomechanics and their administration is encoded within the parameters of the technique described in terms of contact area, location of the contact, intensity and frequency of the stimulus. The emotional properties are related to the sympathetic contact with the patients which allows to administer the technique using a different "affective tone" based on non-verbal relationship and communitive skills. The effects of the technique described in the text are analgesic, affective and somatoperceptual.

patient for treatment, and deliver a therapeutic intervention (Roger et al., 2002). In clinical practice the 'hands-on' ritual highlights the technical competence of the professional (e.g., skills for soft tissues palpation or joint mobilisation); express humanization of the healthcare experience (e.g., communicate compassion and support beyond spoken words); and define physical, personal and professional boundaries (e.g., create a safe space where the therapy can be delivered) (Kelly et al., 2018).

All these undeniable aspects imply that physiotherapists should not abandon manual approaches in the treatment of musculoskeletal pain. In contrast, there is the need to improve the awareness of their potentiality and expand the perspective of their utilization. With this vision, we propose to consider the hands-on techniques as a specific form of touch, in which different dimensions (analgesic, affective, somatoperceptual) should be acknowledged for a more comprehensive interpretation of the beneficial effects of manual therapy (Fig. 1). Moving from this premise, this professional issue aims to explore: a) the different dimensions of touch and, b), their implications for physiotherapy.

## 2. The dimensions of touch in manual therapy

### 2.1. Analgesic touch

Instinctively, each of us is unwittingly inclined to place a hand on a hurting body part, caressing, pressing, sustaining it, checking for body integrity or simply providing some form of self-support for anxiety reduction. The instinctive body touching to reduce pain is probably ancient like the human history and its origin is lost in the mists of time. Since the first studies of Melzack and Wall (1965) on gate control theory to more recent neurophysiologic experiments (Mancini et al., 2014; Nahra and Plaghki, 2003), researchers have confirmed the pain modulatory power of touch. Touch is able to produce pain modulation in a body area around to the location where painful stimuli are simultaneously administered, biasing signal detection, buffering the rating of pain intensity and quality of sensation (Mancini et al., 2014). In this sense, the tactile interaction appears to act through sensory interaction, rather than simply by distraction or other cognitive processes (e.g. lowering levels of anxiety, hypervigilance and fear of pain) (Harper and Hollins, 2012). This down regulation of pain levels (the tactile analgesia) seems to be expression of the pain modulatory function of Aβ fibres on Aδ and C pathways, and may be mediated at brainstem level by subcortical neural circuitry (Mancini et al., 2015).

### 2.2. Affective touch

Touch is able to both communicate and elicit emotions (Hertenstein et al., 2009, 2006; Smith and MacLean, 2007). The touched person can recognize emotions conveyed by the toucher, but only if the touch is contextual (Goldstein et al., 2016). The fact of being immersed in a therapeutic context with expectations of being touched, per se positively prepares the brain to be touched (Andersen and Lundqvist, 2019). On the other hand, caressing, like applying any other kind of manual approach adequate enough to stimulate C-Tactile fibres (the so called 'affective touch') (Croy et al., 2016), may represent a rewarding and pleasant therapeutic experience that facilitates affiliative behaviours (Walker et al., 2017) and pain reduction. These effects are mediated by neuroendocrine signals, including the activation of endogenous opioids, oxytocin and dopaminergic pathways (Ellingsen et al., 2016; Grandi, 2016).

Thus, the sympathetic contact with the patients carries the physiotherapist's touch with the meaningful dimension of non-verbal, context-depended communication (Pinto et al., 2012). Touching with this intention promotes positive emotional responses like feelings of safety and relaxation (Walker et al., 2017) and reduces negative affective feelings, avoidance and stress-related biomarkers (e.g. salivary alpha amylase, salivary cortisol, heart rate) through the deactivation of systems related with stressful response to threat (Maratos et al., 2017).

When the 'right' emotions are delivered according to the patient's emotional status (a more psycho-than physio-oriented duty), hands-on approaches are capable of producing a dyadic empathetic touch-relationship, helping the removal of psychosocial barriers involved in patient's emotional response (Grandi, 2016).

### 2.3. Somatoperceptual touch

Beyond the biomechanical constructs, the hands-on approach may improve the patient's body perception by promoting the reorganization of body mental representations (Longo, 2015), especially for those body regions hidden to the vision, as the spine (Nishigami et al., 2015). The physiotherapist's touch can guide the patient to better find the localisation of pain and tactile stimuli on his body surface (Puentedura and Flynn, 2016). This way, hands-on techniques offer the patient the chance to discriminate between safe and threatening stimuli, promoting the conscious perception of an intact body. Realizing that the body is not damaged, nor threatened (Wand et al., 2016) reduces anxiety, avoidance and defensive responses (Harvie et al., 2016). Overall, exteroceptive stimuli provided by physiotherapist may promote a more integrated patient's body perception (Serino and Haggard, 2010). Recent findings suggest a positive influence of visual feedback on pain perception (Heinrich et al., 2019). In this sense physiotherapists' hands may act similarly to patients' eyes, enhancing the sense of body ownership ('this is my body'), and improving the perceived sense of agency ('I'm in control of my body') (Longo et al., 2008).

## 3. Implications

The expanded framework to include touch for the manual techniques will offer the patient a treatment oriented not only somato-topically but also 'emotion-topically'. This can be achieved with a 'semantic' approach that gives a relational meaning to the hands-on technique, administered respecting the patient's health and emotional conditions.

The exploitation of hands-on techniques as a specific form of touch offers four main important consequences to the physiotherapy profession.

1. *It is not therapeutic if it is not sympathetic.* Clinicians should remember that manual techniques are not tools to fix the patient's body, rather they provide the opportunity to communicate with the patient's brain similar to words. For instance, during the interaction with a person, we can talk using a high or light tone of voice, speaking slowly or speedily, with emphasis or dosing the brakes (what is called "dynamics" in a music performance) with different relapses on our communication. Communication mediated by the touch occurs in the same way. Consequently, clinicians should select the appropriate "dynamics" when administering hands-on techniques, characterized through the properties of the physical (e.g., location, dimension of contact area, intensity, velocity of execution, contact frequency and timing) and emotional (e.g., kindness, reception, affectivity, firmness) stimulus. Therefore, it would be appropriate to focus future research efforts on the physical properties, location and administration methods of the stimulus conveyed to the patients, independently of the kind of manual technique applied (e.g., joint mobilisation, soft tissues intervention, neural sliding). This perspective may help the comparison of manual techniques beyond the supposed biomechanical or neurophysiological rationale.
2. Educators should be aware of the overall therapeutic possibilities of touch that span from the correct execution of manual techniques to the wider consideration of the connection to the patient's body perception and emotions. This paradigm shift requires a continuous development of relation skills to establish an emotional communication with the patients. Teachers should develop a formalization and a more comprehensive science of the "affective touch". To do this, students should be trained in manual techniques as well as in communication skills with a paradigm shift from the use of biomechanical and neurophysiological constructs alone, to the wider consideration of the patient pain experience and emotional communication as informative for technique design. These two aspects need special attention to establish an empathetic contact with the patients that would ease the emergence of the affective touch. Knowledge of biomechanical and anatomical features maintains nevertheless its importance to support the correct execution of hands-on techniques to achieve the intended physical stimulus.
3. Researchers should orient their investigations on two emerging areas: the "affective touch" and the reorganization of mental representation. From the former research field, we may improve the understanding on how to use more proficiently the physical properties of touch in a more "emotionally"-oriented perspective. Through the latter, we may refine the modalities in which we already use hand-on techniques, in order to promote body map reorganization (e.g., through interactive patient involvement in drive selective attention on body sites where tactile stimuli were applied). This perspective reinforces the need for an enlarged multidisciplinary research approach to musculoskeletal pain involving, for example, specialists from fields apparently distant from the clinic e.g. semantics, psychology, ethnology
4. Physiotherapy associations should promote the therapeutic role of hands-on techniques and claim their specificity, even though not exclusive, for the physiotherapy profession. There is the need to state firmly that touching a person is a therapeutic act per se, delivered according to precise theoretical constructs (e.g., neurophysiological, biomechanical, psychological) to insure its results. The relationship between the patient and the physiotherapist, unlike any other ones, represent a particular context in which the physiotherapist has the legitimate permission to have a close contact with the patient's body. Considering also the emotional component carried with the touch, only trained and registered healthcare providers should use this approach in clinical setting.

## 4. Conclusion

In summary, the complex and multidimensional patient-provider interaction exploits manual therapy as a specific form of human touch. In this perspective, tactile stimulation induced by physiotherapist's hands not only meet the patient's expectations but represents a special tool to non-verbally communicate meaningful messages to patients' brain, able to produce analgesia, regulate patient's emotions and reorganize mental representations. We hope that this change of perspective would offer to the physiotherapy community the opportunity to better appreciate the implicit working mechanisms of manual therapy.

## Conflicts of interest

None declared.

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Not applicable.

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