

THE UNIVERSITY OF HULL

The Use of Elastic Therapeutic Tape in Clinical Practice: An exploration of current usage and the evidence base within healthcare professionals.

Being a thesis submitted in partial fulfilment of
The requirements of the Degree of Masters by Research

In the University of Hull

by

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June 2016

Table of Contents

Acknowledgements **i**

Abstract **ii**

Chapter 1: Introduction

1.1	Taping in clinical practice	1
1.2	Athletic or Prophylactic taping	2
1.3	Elastic Therapeutic Tape	5

Chapter 2: Literature Review

2.1	Elastic therapeutic taping	8
2.1.1	Brandings of ETT	9
2.2	Proposed benefits of ETT	10
2.2.1	Muscular activity, peak torque and Grip Strength	11
2.2.2	Range of Movement and Pain Control	17
2.2.3	Improvement of Physical Performance	23
2.2.5	Neurological Conditions	27
2.2.6	Lymphatic conditions	29
2.3	Psychological aspects within healthcare	31
2.4	Clinical Reasoning and evidence based practice within healthcare professions	33
2.5	Aims and Objectives	36

Chapter 3: Methodology

3.1	Piloting	38
3.2	Inclusion and Exclusion criteria	39
3.3	Participants	39
3.4	Ethical Approval and Time Period:	41
3.5	Materials and Procedure	42
3.5.1	Online Survey	42
3.5.2	Interviews	43
3.6	Data Analysis	44
3.6.1	Online Survey	44
3.6.2	Interviews	44
3.7	Researcher bias	45

Chapter 4: Results

4.1	Online survey	46
4.1.1	ETT use in clinical practice	46
4.1.2	Long answer responses surrounding ETT's use, the evidence base and how clinicians view its effectiveness.	50
4.2	Interviews	56
4.2.1	Efficacy of ETT	56
4.2.2	Clinical use of ETT	61

Chapter 5: Discussion and Limitations

5.1	The use of Tape within clinical practice	67
5.1.1	Categories and brands of tape used	67
5.1.2	ETT use within the clinical environment	70
5.2	The efficacy of ETT within population groups as a treatment modality	73
5.2.1	MSK: Primary and Secondary population	73
5.2.2	Neurological conditions: Tertiary population	76
5.2.3	Athletic population group	78
5.2.4	Lower ranking population groups	81
5.3	Perception of evidence base and clinical decision making	83
5.4	Limitations	87
5.4.1	Response and completion rates	87
5.4.2	Interviews	90

Chapter 6: Conclusion

6.1	Conclusion	92
6.2	Future research	93

Chapter 7: References 94

Appendices

A	Professional bodies approached	107
B	Ethical Application	108
C	Participant information	128
D	Online Survey	144
E	Interview questions	147
F	NVivo coding descriptors and themes	150
G	Overarching themes	151

Acknowledgements

First and foremost, I would like to express my profound gratitude to Tom, for his incontestable support, continuous encouragement and patience throughout my years of researching and writing this thesis. You (along with Daisy!) have provided me with the support, stability and sanity to enable me to reach the light at the end of a very long tunnel and this process would not have been possible without you.

Secondly to my parents who although over 300 miles away, have always given exceptional patience, unwavering support and advice. For this and everything, thank you.

I would also like to give thanks to my supervisory team at The University of Hull, although this team changed through my thesis, you have all facilitated my journey to completion.

Finally, to the participants who took time out of their schedules to complete the online survey and the interview process on top of their heavy workload, my thanks go to you all.

Abstract

Aim: The central aim of this study is to explore the current use of elastic therapeutic tape (ETT), the views of the evidence base within healthcare professionals and investigate the reasoning behind its use in clinical practise despite the lack of conclusive evidence.

Method: Six participants piloted the online survey which then went live between 13th October 2014 and 13th December 2014 via Survey Monkey. Active clinicians were recruited via their professional bodies with a link to the survey. To gain further insight, following piloting, interviews took place with six ETT trained and six untrained active clinicians varying in clinical backgrounds.

Results: One hundred and twenty two respondents attempted the survey via the Survey Monkey link, seventy six participants (62.3%) were disqualified from data analysis, fifty nine (77.6%) of these due to the individuals not completing the full twenty one questions. ETT was utilised more in conjunction with athletic taping (n = 29) than ETT alone (n = 17). Results showed the most common population group clinicians worked in was musculoskeletal (n = 23). The majority of clinicians predominate aim of the tape for their primary and secondary population group was injury rehabilitation (n = 15; n = 7), and for their tertiary population was pain reduction (n = 8). Interviews highlighted two main overarching themes, efficacy of ETT and ETT within clinical practice; with the overall conclusion supporting the findings from the online survey of clinicians utilising practice based evidence as opposed to evidence based practice (EBP).

Conclusion: Despite the lack of conclusive evidence, ETT is utilised within clinical practice, although often in conjunction with athletic taping. Furthermore, it can be concluded that clinicians are often using practice based evidence rather than evidence based practice when it comes to defending their application of ETT.

Chapter 1: Introduction

1.1 Taping in clinical practice

Taping within clinical practice presents in two formats; athletic (prophylactic) or Elastic Therapeutic Tape (ETT). Taping is commonly used in clinical practice by healthcare professionals to maintain structural stability, prevent mechanism of injury, or to assist in the musculoskeletal healing process, stimulating the rehabilitation process (Abián-Vicén, Alegre, Fernández-Rodríguez & Aguado, 2009; Constantinou & Brown, 2010; Paulsen & Braun, 2014). Healthcare professionals', such as Graduate Sport Rehabilitators (GSR), Physiotherapists', Sports Therapists', Osteopaths' and Chiropractors', undergraduate training backgrounds vary, yet all professions have the ability to recognise and manage musculoskeletal (MSK) injuries and have the skill set to incorporate taping due to training at undergraduate level (BASRaT, 2015; CSP, 2015; NHS, 2015; SOST, 2015).

Taping originated in the United States in 1895 as an adjunct to traditional medical treatments (Constantinou & Brown, 2010). In the United Kingdom taping originated as Elastoplast in the 1920's by healthcare dispenser Smith and Nephew, with the elastic adhesive bandage (EAB) subsequently manufactured in 1970 (Thackray, 2016). Taping developed from a medical treatment, to become more prevalent in the sporting context from the 1930's, when it was heavily advertised for American Football and Boxing to reduce injuries to the thumbs and the talo crural joint (Constantinou & Brown, 2010; Galland, 1940). There are numerous taping techniques available for MSK conditions, however, to ensure optimum results for a client, anatomical knowledge is key for the taping to be successful to ensure the specific structures are targeted (Berkowitz & Bottoni, 2006; Constantinou & Brown, 2010; McConnell, 1986).

1.2 Athletic or Prophylactic taping

Examples of athletic taping utilised include zinc oxide and EAB for injury prevention (Constantinou & Brown, 2010; Cordova, Ingersoll & Palmieri, 2002), and these materials and their associated techniques have become a prevalent instrument within the sporting context to give mechanical joint support (Hubbard & Cordova, 2010; Miller, Needle, Swankik, Gustavsen & Kaminski, 2012; Raymond, Nicholson, Hiller & Refshauge, 2012). Research has highlighted a greater restriction of inversion and eversion, in comparison to a non-taped group, at the talo crural joint when using the figure of eight and heel lock taping techniques of zinc oxide tape post exercise (Miller *et al.*, 2012). Conversely, research suggests the protective mechanical joint support provided post-taping application, can significantly reduce by 40% after ten minutes of exercise irrespective of technique adopted (Berkowitz & Bottoni, 2006; Greene & Roland, 1989; Manfroy, Ashton-Miller & Wojtys, 2012; McConnell, 1986). Exercise types and intensities which may be affected by this ten minute window, however, have not been made explicit in the available literature. Further research employing valid methodology, exploring these parameters, has the possibility to unveil relationships between joint specific taping techniques and exercise nature and intensity (Refshauge, Kilbreth & Raymond, 2000). Establishing short lived-effects of athletic taping due to its adhesion and tensile abilities, limits the continued effects over time of this type of taping technique.

Contradicting the negative characteristics of longevity, literature outlines athletic taping's provisions as a protective element to an anatomical joint, through the mechanism of reducing accessory joint range of movement (Hubbard & Cordova, 2010; Miller *et al.*, 2012; Raymond *et al.*, 2012). Research has highlighted how the supportive

properties of athletic taping can be beneficial towards outcome measures in addition to reducing injury risk. Chinn *et al.* (2014) found a reduction in plantar flexion and inversion in participants' gait cycles, which is typically the mechanism of an inversion injury. In participants with chronic talo crural joint instability, a figure of eight and heel lock taping technique of zinc oxide was applied to the talo crural joint, showing results that athletic taping caused a neutral talo crural joint position during walking and jogging. Although a small sample size was employed, this could suggest how there is a protective element of athletic taping to prevent injury. In addition, Paulsen and Braun (2014) found when a zinc oxide, figure of eight and heel lock taping technique was applied to the talo crural joint, all available ranges of movement decreased when athletic taping was applied. Furthermore, Miller *et al.* (2012) stated a significant restriction in range of movement, mechanically restricting the joint preventing a possible injury to occur to specific ligaments and tendons. These aforementioned studies have showed athletic taping with zinc oxide is beneficial to restrict movement and provide stability at a joint, which aligns with its properties to be a supportive mechanism (Hubbard & Cordova, 2010).

Raymond *et al.* (2012) presents the understanding of athletic taping to be able to increase proprioceptive acuity with enhanced stimulation of mechanoreceptors, however states research has varied results. This contrast in literature is highlighted by Jerosch, Hoffstetter, Bork & Bischof (1995) finding improvements in proprioceptive acuity, as opposed to Refshauge *et al.* (2012) reporting no significant changes and Refshauge, Raymond, Kilbreath, Pengel and Heijnen (2009) presenting worsening effects and restricting proprioceptive acuity in the inversion-eversion plane in participants with recurrent talo crural sprains. Handoll, Rowe, Quinn and de Bie (2001) discuss how athletic taping can have as much as a 50% reduction on re-injury rates with appropriate

taping techniques, however this finding was made alongside the use of neuromuscular and proprioceptive exercise programmes, possibly attributing positive effects to other contributing parameters. Furthermore, it is reiterated by Hootman, Dick and Agel (2007) that preventative methods undertaken pre-match such as neuromuscular and proprioceptive exercise programmes, could decrease the likelihood of injury alongside athletic taping. Clearly outlined is an opinion that there is no gold standard or clinical guideline to direct a clinician to the best way to tape a joint to reduce injury or facilitate a rehabilitation programme (Hootman *et al.*, 2007).

Following reviewing the vast array of research into athletic taping, its conflicting findings and clinical experience, ETT was subsequently developed by a Japanese Chiropractor, Dr. Kenzo Kase to treat MSK pathologies and sporting injuries half a century after the first athletic taping was available in the United Kingdom (Carmo Silva Parreira, de Cunha Menezes, Carlos Hespanhol Junior, Dias Lopes & Oliveira Pena Costa, 2013; Hosp *et al.*, 2014; Kalron & Bar-Sela, 2013). ETT was originally developed to provide a longer lasting treatment following initial consultation to elderly arthritic patients, which although athletic taping had some short term effects, it often resulted in patients returning to their previous poor posture or joint positioning, with added complications such as skin reactions (Kalron & Bar-Sela, 2013; Kinesio UK, 2014). Therefore, after working with product engineers a tape was developed that was flexible, hypoallergenic, lightweight and could preserve range of movements, mimicking the thickness and resilience of human skin (Carmo Silva Parreira, de Cunha Menezes, Carlos Hespanhol Junior, Dias Lopes & Oliveira Pena Costa, 2013; Hosp *et al.*, 2014; Kalron & Bar-Sela, 2013).

1.3 Elastic Therapeutic Tape

ETT was introduced as Kinesio Tape (KT) in 1970, growing in popularity within the United States and the United Kingdom as a treatment option in the early millennium (Carmo Silva Parreira, de Cunha Menezes, Carlos Hespanhol Junior, Dias Lopes & Oliveira Pena Costa, 2013; Firth, Dingley, Davies, Lewis & Alexander, 2010; Hosp *et al.*, 2014; Kalron & Bar-Sela, 2013). ETT has been defined as a therapeutic tape which is applied to the skin for the management of muscular, neurological and lymphatic pathologies and injuries (Gomez- Soriano *et al.*, 2014; Griebert, Needle, McConnell & Kaminski, 2014; Kalron & Bar-Sela, 2013; Kara *et al.*, 2014; Kase, Wallis & Kase, 2003; Kase, Hashimoto & Tomoki, 1996; Montalvo, Cara & Myer, 2014; Morris, Jones, Ryan & Ryan, 2013). The general theories for ETT is to target different receptors within the somatosensory system and increase the interstitial space within tissue, thus aiding in pain reduction and muscle activation, and decreasing inflammation through lymphatic drainage respectively (Carmo Silva Parreira, *et al.*, 2013). The tape is substantially thinner than athletic tape and is hypothesised to give a greater range of mobility to allow a greater tension to be applied through the tape to target specific muscles in a stretched position (Kalron & Bar-Sela 2013; Kase *et al.*, 2003).

ETT first saw worldwide exposure during the Seoul Olympics in 1988; however, the tape began to become noticed in the public domain after the Olympic Games in 2008 where athletes from selected countries trialled the tape as a therapeutic tool, after a donation by The Kinesio Taping International Association[®] (Firth *et al.*, 2010; Kara *et al.*, 2014; Williams, Whatman, Hume & Sheerin, 2012). After this exposure, it became more common to see athletes wearing the tape within the public domain, for example the London 2012 Olympic Games and The Wimbledon Championships, indicating the

increasing awareness of its possible role in clinical practice (Firth *et al.*, 2010; Kara *et al.*, 2014; Kinesio UK, 2014; KTAI, 2014; Williams *et al.*, 2012).

ETT has often been referred to as a glorified sticking plaster, a fashion statement and a miracle cure by journalists (Kalron & Bar-Sela, 2013), which has posed many unanswered questions as to its use in clinical practice, with limited conclusive evidence to highlight the modality's effectiveness (Morris *et al.*, 2013; Williams *et al.*, 2012). The media circle surrounding ETT has increased within the eyes of the general public, with the rising presence of the tape in everyday shops, pharmacies, newspapers and television publicity, which is a mission stated by the governing body, Kinesio Taping International Association[©] to ensure the growth and expansion of the tape (KTAI, 2014). However, ETT is currently only being publicised through the media, endorsement of sporting teams and health service environments, without the support of a conclusive evidence base.

Mostafavifar *et al.* (2012) systematically reviewed the use of ETT, and found insufficient evidence to support its use in clinical practice, although the authors stated the perceived benefits should not be overlooked. This is supported by Carmo Silva Parreira *et al.* (2013) who discovered articles that produced small, positive effects, however without statistical significance. It was stated that a minority of the studies were of "low quality", meaning their methodology lacked rigour but their findings should not lack consideration. Williams *et al.* (2012) similarly reported that ETT was widely used in clinical practice, however larger participant based randomised controlled trials are needed to be administered to justify its use, as currently clinicians cannot base their judgement on the evidence available.

With over 100,000 practitioners worldwide trained in the use of ETT, over 4,000 in the United Kingdom alone, the taping trend is increasing rapidly, with the evidence base struggling to keep up with demand of the prevalent use (Mostafavifar, Wertz, & Borchers, 2012; Thelen, Dauber, & Stoneman, 2008). In addition to being required to adhere to the role delineation and code of conduct documentation set out by their professional bodies, clinicians are required to be active in continued professional development and to maintain a high level of awareness of current evidenced based practice (French & Dowds, 2008; Weglicki, Reynolds, & Rivers, 2015). It can be hypothesised however, that ETT is utilised within clinical practice even though there is limited and conflicting research referring to its effectiveness and use, as clinicians are opting for practice based evidence as opposed to EBP. Current research suggests that the use of ETT in clinical practice is beneficial and advantageous in the treatment and management of injuries, however it is often stated that an increase in the research into this field, could see practice based evidence evolving into evidence based practice. This thesis therefore aims to investigate how ETT is currently utilised within clinical practice, the populations it is commonly used with, and how clinicians view the current effectiveness and evidence base surrounding the tape.

Chapter 2: Literature Review

Although this thesis aims to investigate clinicians' perceptions and clinical usage of ETT, thus far there is limited research in this area, therefore this review of literature encompasses all aspects of the current evidence base surrounding the modality.

2.1 Elastic therapeutic taping

The popularity of ETT as a treatment option has only grown worldwide since the early millennium (Firth *et al.*, 2010) highlighting the infancy of ETT in comparison to athletic taping within the research setting (Carmo Silva Parreira *et al.*, 2013). Compared to athletic taping, ETT is an elastic cotton strip applied with adhesive acrylic to ensure it can be worn for three to five days without re-application, making the tape cost effective and have longer lasting treatment effects than other hands on techniques or athletic taping (Campolo, Babu, Dmochowska, Scariah, & Varughese, 2013). Firth *et al.* (2010) also state ETT was invented to assist muscle, fascia and joint support whilst also benefiting the lymphatic system, without having the restricting effects of athletic taping (Gomez- Soriano *et al.*, 2014; Hosp *et al.*, 2014; Kase *et al.*, 1996, Kase *et al.*, 2003; Parreira *et al.*, 2014). This could highlight the role that both ETT and athletic tape have within the clinical setting, with athletic taping being utilised for its supportive properties and ETT being employed for a more adaptable, therapeutic effect.

ETT is believed to mimic the human skin, as the tape is approximately the same weight and thickness of the epidermis (Gomez- Soriano *et al.*, 2014; Hosp *et al.*, 2014; Kase *et al.*, 1996, Kase *et al.*, 2003; Parreira *et al.*, 2014). Incorrect application with either too much tension or incorrect technique, can result in negative outcomes such as increasing

pain and irritation of the skin, due to increasing stimulation of the tape creating higher levels of stimulus to the target tissue (Murray & Husk 2001; Nakajima & Baldrige, 2013). ETT's mechanics are presented to increase the interstitial space, through channels in the tape allowing lymph to drain more effectively and decrease the pressure caused by oedema, in turn decompressing nociceptors to reduce pain levels (Bassett, Lingman & Ellis, 2010; Lipińska, Sliwiński, Kiebzak, Senderek & Kirenko 2007; Yasukawa, Patel & Sisung, 2006; Yoshinda & Kahanov, 2007). Lipińska *et al.* (2007) state this can accelerate recovery through improving the delivery of fresh blood and nutrients and the removal of waste products. Irrespective of using athletic taping or ETT, a full MSK assessment is required to clinically reason a treatment modality's use (Brukner & Khan, 2006). Correct tension and tape placement through clinical reasoning is also essential to create a positive outcome for the patient or client (Nakajima & Baldrige, 2013).

Although ETT is accessible to a variety of clinical disciplines (Kinesio UK 2014; Rocktape 2014), current evidence does not adequately investigate the MSK pathologies and clinical environments ETT can be utilised in. This is due to the minimal number of current randomised control trials published which often have methodical flaws, which will be discussed in Chapter 2.2 (Carmo Silva Parreira *et al.*, 2013; Lumbroso, Ziv, Vered & Kalichman, 2013; Thelen *et al.*, 2008; Williams *et al.*, 2012).

2.1.1 Brandings of ETT

Due to the recent increasing exposure and uptake of ETT with clinical practitioners, a substantial number of ETT products have since been developed in addition to KT, for example: Rocktape, Mueller Kinesiology, Curatape, KinTape, KinsioTape, Kineisology

Korea, K-Active and SpiderTech. Differing brands of ETT attempt to claim superiority as the best performing tape, however the similarities in their descriptions of the tape's roles, indicates a need for clarity on the diversities, if present, between the effectiveness of their products (Morris *et al.*, 2013).

ETT brands state the tape may have positive physiological effects on the fascia, muscles, ligaments, tendons, and joints, resulting in the ability to re-educate the neuromuscular system, reduce pain and inflammation, prevent injury, promote circulation and assist in returning the body to homeostasis (Kase *et al.*, 2003; Morris *et al.*, 2013; Williams *et al.*, 2012). Rocktape (2014) additionally state their specific brand of ETT provides a stimulus to increase proprioceptive abilities enhancing performance, and has the ability to withstand a high level of excursion in a competition for example a Football match or Weight lifting event. However to date, no brand of ETT has been sufficiently researched, scrutinising its physiological and neurosensory effects. As competition between ETT brands exists, the producers of KT state “using a tape that has different adhesive, thickness and elastic properties will not produce the same results” (Kase *et al.*, 2003, p14). The increased level of competition across brands and their condemning of competitors products and theories, fuels the scepticism and criticism on the lack of evidence of ETT's benefits and clinical effectiveness.

2.2. Proposed benefits of ETT

As previously mentioned in Chapter 2.1.1, numerous brandings of ETT exist, and throughout this sub-section all brands will be noted as ETT with the specific brand stipulated in brackets, if provided within the study.

2.2.1. Muscular activity, peak torque and grip strength

A variety of studies have assessed the use of ETT on muscular activity, grip strength and peak torque (Briem *et al.*, 2011; Fratocchi *et al.*, 2013; de Hoyo, Alvarez-Mesa, Sanudo, Carrasco, & Dominguez, 2013; Lumbroso *et al.*, 2013; Poon *et al.*, 2014). Briem *et al.* (2011) investigated the effects of ETT (KT) on muscle activity of the fibularis longus in thirty male athletes, comparing an ETT facilitation technique against a figure of eight athletic bracing technique and a control group of no ankle taping technique. The authors reported that athletic taping produced an increase in muscle activity compared to the ETT technique and control groups. Upon interviews, the majority of those who were classed as having poor stability, following a pre-test star excursion balance test, described ETT as feeling the most stable of all three variables. When analysing the main aims of the study, subjective perceptions of the different types of tapes was not primarily alluded to, this highlights the possible bias of the study to identify any positive impact of ETT on the talo crural joint and the individual. Additionally, the techniques applied by each type of tapes were contrasting in their therapeutic aims, with the athletic technique targeting a restriction in accessory joint movement in comparison to a muscle facilitation technique with ETT.

Poon *et al.* (2014) explored how ETT (KinTape) may facilitate contractile times, peak torque and total work output of the quadriceps muscle group during isokinetic testing, and demonstrated no significant difference between ETT, placebo (sham) taping, and no taping, in creating more positive results through isokinetic testing at 60° and 180°/s in thirty participants. de Hoyo *et al.* (2013) also reported a lack of positive statistical significance across all interventions (counter-movement jump, timed 10m sprint and a linear encoded weighted squat) when comparing an ETT (CureTape) applied group

against a control group in eighteen elite soccer players. It is difficult for direct comparisons to be made between Poon *et al.* (2014) and de Hoyo *et al.* (2013), as different brands of ETT and application techniques were used. As discussed in Chapter 2.1.1, opposing brands claim their products have different attributes, possibly affecting study results suggesting the requirement of further research for different ETT brands to be the dependant variable when assessing physical parameters. Further criticism is that the physical tests used in both studies were not comparable as Poon *et al.* (2014) employed a single plane movement as opposed to de Hoyo *et al.* (2013) who utilised a series of multi-plane, more functional movements; this could also benefit future research through the assessment of ETT brands in opposing movement patterns and sequences. Correlation with the prevention of injury at functional joint speeds (Lockie, Jeffriess, McGann, Callaghan & Schultz, 2013), was limited with Poon *et al.* (2014) as the authors investigated muscle facilitation at 100°/s using isokinetic dynamometry assessing the parameters noted earlier. Although the dynamometry speed utilised was not at a functional speed as those that could be reached during the movements employed by de Hoyo *et al.* (2013) investigation into the effects of ETT on slower and faster dynamometry speeds could be useful to better gauge the tapes response to joint movement and muscle activation.

Wong, Cheung and Li (2012) investigated peak torque for the vastus medialis in thirty participants and concluded no significant improvement in peak torque with ETT (KT). However, the time to reach peak torque decreased in knee extension in the ETT group, implying the potential reduction in risk of injury as reactive response to protect muscle tissue or joint structure could be improved. These effects however, cannot be completely eliminated due to the lack of comparison of ETT with a sham taping or control group. In contrast, Lumbroso *et al.* (2013) concluded peak torque was increased

from immediate application to continued application two days post with the use of ETT (KT) on the gastrocnemius on thirty-six participants. Application techniques are questionable in this study with the use of different physical therapy students applying the tape under no direct supervision, with no indication of standardisation. ETT brands allude to the importance of corrective procedure and training when applying the tape for the greatest potential benefit (Kase *et al.*, 2003; KTAI, 2014; Rocktape, 2014; Spidertech, 2015). Fratocchi *et al.* (2013) significantly improved elbow peak torque ($p = 0.05$) compared to standardised sham tape and non-tape interventions spread five days apart in assessing the use of an ETT (KinsioTape) standardised taping technique from Kase *et al.* (2003) in twenty participants with an isokinetic pulley system. These three studies highlight the conflicting research surrounding the use of ETT, however even though different muscle groups were examined, this possibly identifies the importance of standardised tape application and choice of ETT brand increasing effectivity of the intervention.

Gomez-Soriano *et al.* (2014) found ETT (Curetape) had no effect on muscle tone, increase of strength or extensibility of the gastrocnemius in comparison to placebo taping with nineteen participants. Nevertheless, some short term increases in electromyography (EMG) activity on the gastrocnemius during the final degrees of ankle dorsiflexion (Gomez-Soriano *et al.*, 2014) were apparent, suggesting some activation of the central nervous system may be positively affected by the use of ETT. Gomez-Soriano *et al.* (2014) conducted the study with non-injured subjects, assessing only short term effects (twenty four hours), which Kase *et al.* (1996) explains could be the reason the diminished results were seen. It is hypothesised that ETT is most effective with the greatest effects on movement quality when there is a pathology to correct, and the longevity of ETT's application could have had further beneficial

outcomes beyond the tested period of Gomez-Soriano *et al.* (2014) (Kase *et al.*, 2003). These points only strengthen the argument that insufficient scientific evidence is present identifying ETT has an increased beneficial effect on the body when a musculoskeletal pathology is present exists. (Gomez-Soriano *et al.*, 2014; Lins, Neto, Amorim, Macedo & Brasileiro 2013).

In comparison, Aguilar-Ferrández *et al.* (2013) established that ETT (KT) enhanced gastrocnemius muscle activity, tone, and improved symptoms such as venous flow within women with chronic venous insufficiency compared to a placebo (sham) taping group in one hundred and twenty women. However, although the research looked at participants with a specific pathology, this was a single gender study, meaning the results should not be assumed to the male population and a mixed gender study would validate the results further. Furthermore, although both studies used the same technique, the branding of the ETT varied, which with limited evidence comparing the abilities of each brand, reiterates the need for greater awareness of self-nominated brand superiority (Kase *et al.*, 2003; KTAI, 2014; Rocktape, 2014; Spidertech, 2015).

Lins *et al.* (2013) established within sixty females that ETT (KT) did not alter the neuromuscular performance of the quadriceps by investigating EMG activity during single and triple one-legged hops. Lins *et al.* (2013) discussed the hypothesis of Kase *et al.* (1996) of ETT increasing interstitial space and blood flow causing an increase in muscle activity additionally to the application of ETT stimulating cutaneous receptors of the skin, thus having beneficial effects on muscle activity. To investigate this, a sham taping group was employed as well as a bandage group to simulate the stimulation of cutaneous receptors; the lack of significant results of this study disputes the hypothesis

of Kase *et al.* (1996). Lins *et al.* (2013) criticise their own methodology due to the participants being healthy and active, and suggest future research should be focussed and conducted with participants under a rehabilitation programme who may have decreased musculature recruitment, perhaps aligning better with the theories of ETT brands (Kase *et al.*, 2003; KTAI, 2014; Rocktape, 2014; Spidertech, 2015). Furthermore, due to the research primarily investigating healthy subjects it can be difficult to relay these theories into practice.

Lin, Hung and Yang (2011) investigated how the EMG of shoulder muscles (upper and lower trapezius, serratus anterior and anterior deltoid) during mid and outer range, elevated tasks and shoulder proprioception were affected by application of ETT (KT). Two experimental conditions were applied to twelve subjects with no history of shoulder injuries: ETT applied to the scapula and a no tape condition. Proprioception index figures were derived from timings to reproduce set movements and reproduction of joint positioning, and were seen to be significantly higher when taping was applied. EMG results displayed that upper trapezius and anterior deltoid activities decreased in comparison to the non-taped intervention, however serratus anterior activity increased in the taping group. This highlights ETT can have an effect on muscle activity and that this can be correlated with proprioceptive feedback, supporting the branding theories stating ETT can facilitate muscular control as well as proprioceptive enhancement (Kase *et al.*, 2003; KTAI, 2014; Rocktape, 2014; Spidertech, 2015).

Chang *et al.* (2013) studied the effectiveness of ETT (KT) with medial epicondyle tendinopathy compared to a placebo (sham) tape and a control non-taped group with twenty-seven athletes. Results indicated that ETT made no significant difference in grip

strength compared to the placebo and non-taped group. Merino-Marban, Mayorga-Vega and Fernandez-Rodríguez (2012) also found no significant increase in grip strength immediately or forty eight hours after application of ETT (Kinesiology Korea) with thirty-one participants. The tape used within Merino-Marban *et al.* (2012) was similar to the placebo (sham) used by Chang *et al.* (2013) and neither yielded positive outcomes on grip strength. Suggestions have been made that the grain on the material and adhesive varies on ETT branding, creating contrasting levels of stimulation of the cutaneous receptors of the skin (Lins *et al.*, 2013) and this could have negatively affected results (Chang *et al.*, 2013).

An earlier study conducted by Chang *et al.* (2010) examined the immediate effects of ETT (KT) on maximal grip strength under three conditions: no tape, placebo tape and ETT, reporting no statistical difference in maximal grip strength in twenty one athletes when using a handheld dynamometer. In contrast, Donec, Varžaityte and Kriščiūnas (2012), also using handheld dynamometry, reported greater increases in grip strength from baseline levels of 6.0% at thirty minutes and 7.7% at one hour post application of ETT (KT) when compared to a sham taping group and control group showing less significant changes. However, there was an uneven balance of the fifty four participants, with the ETT group (n =32) versus placebo (n =22) group, and the control group was the participants' alternative hand to which was taped in the testing groups. Eradication of limb preference effecting the results obtained was controlled by hand dominance being homogenous in all testing groups. Moreover, Donec *et al.* (2012) also investigated the use of ETT (KT) with key pinch strength (force between thumb and index finger) measured using a mamometer, which resulted in no significant difference in strength thirty minutes after application, but one hour after application, results reached significance.

The results obtained in the literature regarding grip strength highlight the possible longevity of therapeutic effects for ETT in comparison to the short-lived effects seen with athletic taping discussed in Chapter 1.2, however contradicting evidence and lack of substantial clarity on the effectiveness of ETT continues to be apparent.

2.2.2 Range of Movement and Pain control

Due to the effects decreasing pain can have on increasing ROM within the literature, these two elements within the ETT field have been combined as often they have been interlinked within the studies and have been considered as indirect, secondary benefits to each other.

Further comparisons can be made between athletic taping and ETT when considering their effects on ROM, with ETT being described as providing the stimulus to improve ROM (Yoshida & Kahanov, 2007); this is in comparison to athletic tape's restrictive nature described in Chapter 1.2. Much more literature has been published reporting the relationship between ETT and ROM, with a good proportion presenting results that are supportive of ETT as a modality (Alves de Oliveira, da Silva Paixa Batista, Pitangui & Cappato de Araújo, 2013; Ujino Eberman, Kahanov, Renner & Demchak 2013; Van Herzeele, Van Cingel, Maenhout, De Mey & Cools, 2013).

Ujino *et al.* (2013) reported that the use of ETT (KT) improved shoulder ROM when compared with a stretching programme in seventy one participants who had no history of shoulder injuries. It was concluded that ETT alone increased glenohumeral total arc of motion greater than the stretching group. However Ujino *et al.* (2013) also stated, the

combination of stretching and ETT did not have any effect on baseline measures, which is contradictory to a large body of research stating stretching programmes of varying lengths, from thirty minutes to three weeks, can have gross positive effects on shoulder ROM. This highlights the shortcomings in Ujino *et al.* (2013), research as to the validity of results. Validity can be questioned even further in Ujino *et al.* (2013) study as through analysis of the methodology, there was no explanation as to why participants were not monitored through their stretching programmes; this could have diminished post-intervention outcomes and shows a level of bias towards discovering positive effects of ETT. However, due to the participants being healthy, the therapeutic effects such as increasing ROM and decreasing pain outlined by Kase *et al.* (1996), may have been influenced. The results of Ujino *et al.* (2013) are supported by a clinical trial conducted by Thelen *et al.* (2008) who also found that ETT (KT) improved shoulder ROM compared to a placebo tape. Again, the research lacked concrete validity due to aspects of the methodology, as a lack of control group prevented other aspects of participants' rehabilitation being accounted for when assessing improvements in range. Additionally also some participants were still taking non-steroidal pain relieving medication when assessing participants' subjective views on restricting ROM.

Research has also considered the indirect influences ETT can have on ROM and not just its direct effects. Alves de Oliveira *et al.* (2013) researched ETT (KT) in shoulder impingement syndrome in fifteen amateur male athletes (sport not specified); highlighting how ETT's therapeutic effects of pain relief can benefit increases in ROM. It was established that ETT reduced pain levels and improved scapular dynamics, resulting in greater ROM. This links to the theories outlined by Kase *et al.* (1996), which state that reducing pain levels is a main positive outcome of KT, to help facilitate ROM, however it is evident that traditionally if pain is decreased, then ROM will often

increase (Trost & O'Neil, 2014). Limitations are still present with these results as no control group, without the ETT intervention, was assessed to identify the level of improvement gained from ETT on top of general injury recovery over the time frame. Van Herzele *et al.* (2013) used ETT (K-active) to investigate how the quality of ROM can be affected through postural setting using the tape. It was found that in twenty five female athletes, positive improvements were seen in all three planes of humeral movement (sagittal, frontal and scapula) suggesting that postural corrections can be used as preventative methods within shoulder rehabilitation programmes to facilitate other hands on techniques and strengthening programmes. Researching further into this field by comparatively looking at ETT to athletic taping could highlight which, if either, had beneficial effects on postural correction for improved ROM. In contrast to the aforementioned studies, Kaya, Baltaci, Toprak and Atay (2014) concluded when ETT (KT) was used alongside an exercise programme for shoulder impingement in fifty-four participants diagnosed with the pathology, there was no significant difference for the ETT group compared to a manual therapy and exercise group. However, no comparative or control group was apparent in Kaya *et al.* (2014) study, with tape application differing for each participant dependant on their specific needs signifying a need for a stricter protocol to follow for direct comparisons to be made.

González-Iglesias, Fernandez-de-Las-Penas, Cleland, Huijbregts and Del Rosario Gutierrez- Vega (2009) support the use of ETT within neck pathologies following the investigation of forty-one patients diagnosed with whiplash associated disorders (WAD). It was concluded the ETT (KT) exhibited statistically significant improvements in ROM, thus decreasing pain, immediately following application and twenty-four hours post application compared to a placebo (sham) group. However, there was a lack of control group, results were assessed short term, and González-Iglesias *et al.* (2009)

stated ETT should only be applied with the correct tension stated by Kase *et al.* (2003) to achieve any benefits. There was a failure however to apply any tension to their testing group, meaning there would not be a pull on the epidermis, which in line with the ETT theories would not provide the physiological aspects or proprioceptive feedback needed for the tape to be effective. Furthermore, the research did not outline or assess the tape's abilities in comparison to the traditional treatment of WAD and failed to outline the time between diagnosis of WAD and the intervention, as this could affect the rate of improvement in symptoms as acute injuries can respond better to immediate treatment (Mattacola & Dwyer, 2002).

Parreira *et al.* (2014) investigated ETT (KT) compared with placebo taping in participants with chronic lower back pain (CLBP). After applying ETT to 148 patients with CLBP over a twelve week period, no significant differences were noted after eight applications for decreasing pain levels compared to the placebo taping group. The placebo taping group also had ETT applied, but it was applied without tension, which Kase *et al.* (1996) state is needed to create the convolutions of the skin to enhance the physiological properties of the tape resulting in an increasing blood and lymphatic flow to the injury site facilitating recovery. This challenges Kase *et al.*'s (1996) theory of ETT's mechanisms stating accurate tension is paramount to ensure the desired effects are achieved. Kachanathu, Alenazi, Seif, Hafez and Alroumim (2014) also determined ETT (Curatape) would be beneficial for patients with nonspecific CLBP if ETT was applied alongside a physical therapy exercise programme of strengthening and stretching to the abdominals, lower back and hamstrings, despite results for the forty participants ETT group not reaching significance. However, the control group of the exercise programme also found benefits from the stretching and strengthening programme, showing that ETT was not the sole intervention to cause positive outcomes.

Similarly Castro- Sánchez *et al.* (2012) concluded ETT (Tem Tex) had an increased, yet minimal effect in reducing CLBP in sixty participants compared to a placebo (sham) taping group, with no significance being found with other parameters including muscle endurance and increasing ROM. However, this study only assessed the short term effects, which with a chronic injury; immediate effects are not always seen due to the body's natural healing process and patient subjective perceptions of pain (Mattacola & Dwyer, 2002). The theory of ETT has been described as aiding with the reduction of inflammation to facilitate the healing process (Mostafavifar *et al.*, 2012), however initial aims of recovery with a chronic injury is to instigate an inflammatory response (Mattacola & Dwyer, 2002). This poses the question as to whether ETT is effective for the initial recovery stages of a chronic injury, with further research required into this area. Although these aforementioned studies utilised different brandings of ETT, research carried out thus far shows ETT can be beneficial when treating CLBP alongside other inventions, however further randomised controlled trials in the same brandings with control groups need to be conducted to validate results further.

Highlighting other common spinal regions and pathologies associated with pain control, Mariana and Carmen-Oana (2014) investigated ETT (KT) versus massage in mechanically triggered neck pain which is described by holding a monotonous position, for a long period of time causing pain and stiffness to the cervical spine. Unfortunately only six participants took part which could highlight a decrease in validity due to the low sample size (Maxwell, 2005), however it was concluded that after a four week intervention of either ETT or massage, ETT decreased pain more rapidly than massage alone. ETT also increased ROM at the cervical spine greater than the massage intervention, which supports the theory of Kase *et al.* (2003) of ETT indirectly increasing ROM through pain reduction. Saavedra-Hernández *et al.* (2012) also

investigated mechanically triggered neck pain, utilising seventy-six participants comparing ETT (KT) with cervical thrust manipulations. It was determined 52.6% of participants showed reduction in neck pain, measured through a numeric pain rating scale and increased active ROM in functional activities measured through a subjective questionnaire with graded responses when using ETT. Results were only obtained seven days post cervical thrust manipulation or tape application, however due the short time effects seen with cervical thrusts (Martínez-Segura, Fernández-de-las-Peñas, Ruiz-Sáez, López-Jiménez & Rodríguez-Blanco, 2006), optimal benefits may have not been witnessed, falsely claiming greater benefits with ETT. Unfortunately, there was no control group in the aforementioned studies, therefore giving the possibility that results may have resulted due to the placebo effect.

Campolo *et al.* (2013) compared ETT (KT) to athletic taping and how this corresponded with functional movements and their effect on anterior knee pain. Out of twenty subjects with unilateral anterior knee pain, both ETT and athletic tapes were effective in reducing subjective numeric pain scores when compared to the non-taping group when performing stair climbing activities, however no significant difference of pain scores was found when comparing the two tapes. Furthermore, when using ETT and athletic tape with the functional movement of a squat, results of subjective decreasing pain did not reach significance between both the taping and non-taping groups. This was discussed by Campolo *et al.* (2013) that due to the squat load being only 10% of body weight, it did not place as much force through each unilateral limb as the stair climb, possibly reasoning the lack of eliciting a pain response, yet questions whether both tapes act as a placebo effect. True comparisons cannot be made between the two different taping techniques as inadequate information was supplied regarding their application Differing taping methods for each type of tape could have facilitated the

target joint in opposing ways, changing the outcome measures. Conflicting information is present regarding the effect of ETT on pain, however the evidence is not transparent regarding the direct sole effects of ETT compared to other interventions.

The limitations in the methodologies conducted into assessing ROM with ETT, does not present any clearer, conclusive evidence to justify its application by practitioners to increase range. Although, improvements have been seen, with strong links to the decrease of pain levels (Alves de Oliveira *et al.*, 2013; González-Iglesias *et al.*, 2009), the lack of control groups and full acknowledgement of all confounding factors does not make it possible to validly attribute all physical improvements to the application of ETT.

2.2.3 Improvement of Physical Performance

It could be argued that studies assessing improvements in ROM, reduction in pain and beneficial manipulation of posture can improve overall performance, however performance itself has been considered as an indirect, secondary benefit of ETT usage within the literature. Improvements in physical performance could be attributed to any of the studies discussed within Chapter 2.2, however direct assessment of the impact ETT could have on physical performance has been limited in its evidence.

An, Miller, McElveen and Lynch (2012) examined the use of ETT (KT) in sixteen athletes to establish if scores could be improved on the lower extremity portions of the Functional Movement Screen (FMS). Results concluded that ETT significantly enhanced the performance of the hurdle step and lunge element of the FMS, but did not

affect results for the deep squat. However, due to the scoring system of the FMS being categorical and only marked out of four, caution should be taken as individual assessor interpretation can affect the reliability of the scores (Kraus, Schütz, Taylor, & Doyscher, 2014; Teyhen *et al.*, 2012). The improvements seen in selective exercises of the FMS could highlight the possibilities of ETT being more beneficial at improving attributes required for these specific movements, for example the improvements seen in the hurdle and lunge stations require an increased level of proprioception. Furthermore An *et al.* (2012) stated that these elements improved due to the deep squat requiring weight bearing aspects, in comparison to a traditional FMS hurdle step and lunge which they stated as non-weight bearing. With additional research investigating these movements further, the theory by Kase *et al.* (1996) of ETT helping to activate receptors that contribute to proprioception, could be evidentially proven.

Murray and Husk (2001) examined thirty healthy subjects' ankle reproduction of joint position sense and compared ETT (KT) to a non-taped ankle. The authors concluded using ETT for a lateral ankle sprain improved proprioceptive abilities in non-weight bearing positions, especially in the midrange of ankle motion where ligament mechanoreceptors were inactive. However, their subjects did not have any injuries to the joint in question, which decreases the validity of the results. This can be transferred to functional performance through the reinforcement of An *et al.* (2012), who claimed improvements in the non-weight bearing movements needed in the hurdle and lunge stations of the FMS. Yet as previously discussed, these elements do require weight bearing elements. However, Halseth, McChesney, Debeliso, Vaughn and Lien (2004), researched the effects of ETT (KT) specifically on proprioception at the talo crural joint on thirty subjects. The authors reported ETT did not statistically increase or enhance proprioception of the talo crural joint when assessing reproduction of joint position

using sensory blinding (Head phones, bare feet and blindfolds) when compared to an un-taped group This shows conflicting evidence surrounding the effectiveness on the proprioceptive abilities at the talo crural joint, however the methodology used by Halseth *et al.* (2004) was much more stringent than that of An *et al.* (2012) and Murray and Husk (2001), by eliminating other senses so as to focus on proprioceptive abilities.

Hosp *et al.* (2014) investigated the effect of ETT (Nasara Original Kinesiology) on knee proprioception after physical activity in twelve healthy females. It was concluded overall proprioception did not improve with the use of ETT compared to when participants were non-taped, this non-taping protocol was carried out on the same participants with a week's rest in between each intervention, rather than a separate control group. However after splitting the females into 'good' (n =5) and 'poor' (n =7) proprioceptive groups, it was concluded those participants who were categorised by researchers into the poor proprioceptive ability group, had an increased awareness of joint position following an uphill walk measured by reproduction of joint position sense. The study allocated participants into the poor and good groups by their average reproduction of joint position sense scores and stated the six worst scorers were in the poor group, yet the validity of these groups can be questioned as participants may have familiarised themselves with the testing protocol. In terms of replicating this to the global population, it could be questioned whether these scores are statistically poor, and to what assessment proprioception is graded to. Due to the inability to eliminate researcher subjectivity from testing following the allocation of good and poor proprioceptive groups, along with small sample sizes in each group, does not eliminate bias and decreases validity.

Huang, Hsieh, Lu and Su (2011) found when thirty-one healthy adults performed a vertical jump, the ability to jump higher was significantly increased when ETT (KT) was applied to the gastrocnemius compared to a placebo (sham) tape. However, although the study followed the application guidelines from Kase *et al.* (2003), there was no stipulation of the tension applied through the tape making it difficult to replicate the study and linking to the theories outlined by Kase *et al.* (1996), too high tensions can cause negative outcomes and physiological issues within the tissue. In contrast, Nakajima and Baldrige (2013) concluded ETT (KT) did not increase vertical jump height in twenty seven healthy subjects, but did improve dynamic postural control in comparison to a placebo (sham) taping group, when assessing the star excursion balance test. The ETT application of Nakajima and Baldrige (2013) differed from Huang *et al.* (2011) by targeting the muscles on the anterior portion of the lower limb. This makes direct comparison difficult due to the different levels of muscle recruitment of these two muscle groups when performing the vertical jump. Assessing ETT application on the main musculature involved to produce the movement of a vertical jump, the quadriceps group (Wakefield & Cottrell, 2015) may result in more noticeable changes with a greater muscle mass being targeted.

Merino-Marban, Ferndandez-Rodriguez, Navarrete and Mayorga-Vega (2011) piloted the use of ETT (KT) within six triathletes to reduce competition injuries to the calf group muscles. It was concluded when ETT was utilised, none of the athletes suffered any injuries, cramps or perceived pain in the calf group in comparison to the non-taped areas. These areas such as the quadriceps, which suffered strong cramps, possibly presents that ETT is a viable option to avoid cramping in athletes with high demands in their sport, conceivably supporting the proposed effects of ETT to increase blood and lymph flow (Williams *et al.*, 2012). However, to purely assess a subjective account of

the number of injuries rather than couple with performance measures decreases the validity of the study as no objective measures were taken (Trost & O'Neil, 2014). Furthermore, the authors investigated a small group of subjects, which could make their results coincidental and increasing the likelihood of a placebo effect. Moreover, the calf muscles undergo different stresses compared to the quadriceps muscle groups during the sport investigated, so it is difficult to be able to validly claim the outcomes were solely due to the effects of ETT.

2.2.4 Neurological conditions

Research within specific neurological pathologies is limited, however a handful of researchers have investigated Parkinson's disease, Cerebral Palsy and Meralgia Paresthetica (Capecci *et al.*, 2014; Kalichman, Vered & Volchek, 2010; Kara *et al.*, 2014). Capecci *et al.* (2014) investigated ETT (KT) in Parkinson's and its use in postural correction. Although results showing improvements in the Berg Balance Scale, timed up and go and assessment of trunk flexion were significant, the sample size was small ($n = 20$) to conclude a strong evidence of efficacy. During the four week study period, postural rehabilitation was still being undertaken by participants, which included active trunk movements and proprioceptive exercises, this had similar target effects to that of ETT to improve posture through mechanical correction (Capecci *et al.*, 2014), concluding that the full effects of ETT cannot be fully understood as other influencing factors were present in affecting performance during testing.

Kara *et al.* (2014) assessed the impact of ETT on functional movement similar to that of Capecci *et al.* (2014), however investigated the modality with children with cerebral palsy. The authors found that ETT (KT) had a positive outcome on a number of

measured variables: sit to stand, step up and muscle power through the muscle power sprint test, which are utilised with cerebral palsy sufferers. The results were significantly better than a non-taped control group supporting the theories of differing ETT brands improving muscle function and proprioceptive feedback (Mostafavifar *et al.*, 2012), however the effects of age and gender on ETT performance need to be further investigated as this study in particular investigated a mixed gender sample with a young, but large age range (7-14years). Results need to be interpreted with caution as research has shown gender and also stage of puberty can have varying effects on growth hormone levels, therefore increasing muscular abilities which could increase performance on activities of daily living such as the sit to stand and musculature power during walking (Kuperminc *et al.*, 2009). Greater understanding of the impact and possible role ETT could play within paediatrics, in particular chronic conditions, could help to influence future medical practice and benefit the reputation of ETT.

Further literature identifies the possible advantages ETT can have within neurological conditions. Kalichman *et al.* (2010) suggested ETT (KT) should be used in the treatment of patients with Meralgia Paresthetica. Statistically significant improvements were found in a subjective visual analogue scale of the common complaints of Meralgia Paresthetica (burning sensation/pain/paresthesia) and its effects on patient's quality of life. The authors also concluded there was a reduction in the surface area on the outer thigh of where the common symptoms occur, however the lack of comparison to the conjunctive treatment (non-steroidal medication or general physical rehabilitation) does not add to current clinical practice because of no added evidence to prove ETT is superior to current global practices for this pathology. Kalichman *et al.* (2010) suggests that ETT could be most beneficial used in conjunction with traditional treatments associated with Meralgia Paresthetica, although with some pathologies a variety of

treatment modalities are used and ETT may well have its place alongside them. Again the methodological quality of the paper is poor, with the omission of a blind observer which can reduce the likelihood of investigator bias (Hróbjartsson *et al.*, 2012), and the lack of control group does not help to improve clinicians' opinions of ETT within this field. Therefore a proposed lack of confidence in the sole use of ETT as a modality poses the question that further research is needed before ETT is utilised as a comprehensive treatment over other interventions with certain pathologies.

Analysing the findings of Kalichman *et al.* (2010) presents a similar story to other literature investigating ETT for a variety of pathologies and therapeutic effects; current evidence with its lack of sound methodology and omission of control testing does not add any further, proven quality to current treatment approaches and protocols. Without such evidence, the impact of this research on influencing the opinions of practitioners, and therefore current medical practice is limited, preventing a growth in the educated use of ETT.

2.2.5 Lymphatic conditions

As previously mentioned in Chapter 1.3, the mechanism of ETT is to increase interstitial space, improving the level of drainage and lymphatic flow (Morris *et al.*, 2013; Mostafavifar *et al.*, 2012); however scarce evidence exists to support this claim. As discussed throughout Chapter 2.2, an increase in blood flow caused by ETT has been alluded to aiding improvements in physical parameters (ROM and muscle function), however investigation into blood flow and lymphatic drainage as a primary function of ETT has been limited with literature being restricted to case reports instead of high quality controlled trials.

Some studies however have described statistically beneficial effects, with Lipińska *et al.* (2007) reporting ETT (KT) statistically decreased oedema by 24% in twenty-five women with lymphedema following breast cancer. As a result of this decrease in oedema, patients' ROM increased by 20% and also reduced muscular tension to enhance therapeutic effects such as discomfort and pain when investigating the use of ETT (Lipińska *et al.*, 2007). Positive results in reducing oedema were also seen by Pekyavaş, Tunay, Akbayrak, Kaya and Karataş (2014), who presented that oedema was reduced in forty five patients suffering from Lymphoedema when ETT (KT) was utilised on its own and also with a compression bandage, compared to a bandage alone. Although benefits were seen, control of the methodology was limited due to the nature of the condition; home programme rehabilitation was not monitored for the study period and a control group of no interventions or rehabilitation could not be included due to ethical constraints of preventing deterioration of the condition. This presents the difficulties of trying to isolate the use of ETT as a sole intervention with the demanding nature of aggressive conditions. An element of professional judgement and appraisal of current published research has to be employed by clinicians deciding to utilise ETT within this field of clinical practice.

The improvements in physical parameters seen in the aforementioned studies which have been attributed to the reduction in oedema, highlights that the theories outlining ETT's benefits for increasing blood and lymphatic flow could be validated by the vast number of research papers witnessing improvements in ROM, muscle activity and proprioceptive ability. This is why further research into the effects of ETT on blood and lymphatic flow is required to solidify if ETT has a primary function of improvement of these parameters and consequently has an effect on other physical factors.

2.3 Psychological aspects within healthcare

Perception can be defined as our recognition, interpretation and response of information (Bond & Soundy, 2012). Beliefs derive from a mental representation of an attitude orientated towards the likelihood of something being true and can be influenced by past experiences (Wellman & Woolley, 1990). Healthcare professionals develop perceptions and beliefs following past experiences with a modality or through previous experiences with clients (Bond & Soundy, 2012). Perceptions are often not based on full understanding of what is being perceived, and are often interchangeable and influential, highlighting the differing of clinicians' opinions (Wellman & Woolley, 1990).

In a stimulating competitive environment, the media can exploit areas to help mould our knowledge, perceptions and beliefs (Scheufele, 1999; Wählberg & Sjöberg, 2000). Given the manipulative potential the media can have on an individual, this can affect the dispersion of information with peers, colleagues and clients (Scheufele, 1999; Wählberg & Sjöberg, 2000) and as such may not only influence clinician's perceptions but also clients' perceptions surrounding ETT.

Peer discussion and in service development may also influence perceptions and beliefs, which research suggests can enhance the quality of learning, although difficulties are often seen in managing differences in perceptions (Currens & Bithell, 2003). The clinical environment is often utilised as a place for in service development where professional skills, perceptions and beliefs surrounding clinical experiences are shared when put into a clinical context (Strohschein, Hagler & May, 2002). Research also states that the use of continued professional development can be a negative influence to clinician's perceptions and beliefs, as the challenge for employers to provide the time, resources of funding and the environment in which to provide the in service training can

be limited (Ernstzen, Bitzer, Grimmer-Somers, 2009). Highlighting the need for employers to promote clinician's to participate in in service development, which may in turn influence and solidify the perceptions and beliefs of a treatment modality (Ernstzen *et al.*, 2009).

The use of tape within clinical practice has been suggested as a psychological tool for athletes, and alongside objective markers of improving performance and recovery, taping can also have subjective influences such as increasing confidence and reassurance resulting in patients or clients requesting its use (Delahunt, McGrath, Doran & Coughlin, 2010; Gear, Bookhout & Solyntjes, 2011; Hulme & Gerrard, 1998; Hunt & Short, 2006; Sawkins, Refshauge, Kilbreath & Raymond, 2007). However, this increase in confidence has often been linked to the multifaceted theory of the placebo effect (Sawkins *et al.*, 2007), that has been defined as the “limitations of specific treatments, with the absence of the specific therapeutic constituents” (Kienle & Kiene, 1997, p1311). Although not ethical, in clinical practice treatment modalities can be used to build optimism and influence expectation, which may in turn improve the treatment outcome (Bystad, Bystad & Wynn, 2015; Kam-Hansen *et al.*, 2014; Kienle & Kiene, 1997; Kirsch, 2013). Although, placebo effects are well documented in the literature (Bystad *et al.*, 2015; Colloca, Jonas, Killen Jr, Miller, & Shurtleff, 2015; Kam-Hansen *et al.*, 2014; Kirsch, 2013), every individual can react differently to treatment approaches, resulting in an individualised placebo effect meaning some people respond more strongly than others (Bystad *et al.*, 2015). In relation to ETT, there is limited research into the placebo effect, however Tremblay and Karam (2015) stated there is difficulty in determining whether ETT has a placebo effect or whether it is more of a psychological crutch, with further research into the reasoning behind its use required.

2.4 Clinical Reasoning and evidence based practice within healthcare professions

Clinical reasoning is an independent way of decision making within professional practice and is based upon constructing narratives to identify the multifactorial issues surrounding a particular question (Cimino, 2013; Cruz, Moore, & Cross, 2012; Forsberg, Ziegert, Hult & Fors, 2013; Higgs, 2008; Nendaza & Perriera, 2012; Sniderman, LaChapelle, Rachon & Furberg, 2013). Literature states that clinical reasoning is at the epicentre of clinical practice and it is vital that clinicians utilise their autonomy, accountability and responsibility as a healthcare professional to facilitate this critical thinking approach (Cimino, 2013; Cruz *et al.*, 2012; Forsberg *et al.*, 2013; Higgs, 2008; Nendaza & Perriera, 2012; Sniderman, *et al.*, 2013). Clinical judgement when interpreting literature is important when working with complex pathologies involving multifaceted conditions; as research is unable to give definitive answers on the full extent of interventions' influences on certain pathology. Healthcare practitioners are trained throughout their undergraduate degrees in the art of clinical reasoning and critical decision making both of which are integral elements to a healthcare role, and these skills are frequently assessed in order to prepare for future professional duties (Charlin *et al.*, 2012; Cruz *et al.*, 2012; Custers, 2013; Higgs, 2008).

Treatment modalities are typically utilised within clinical practice based on sufficient evidence (Artino, Cleary, Dong, Hemmer & Durning 2014; Dickson & Flynn, 2012), however research highlights that clinical reasoning is occasionally based on previous experiences, perceptions and beliefs surrounding a modality (Artino *et al.*, 2014; Charlin *et al.*, 2012; Cruz *et al.*, 2012; Custers, 2013). This has been criticised in research as clinical reasoning should be a scientific procedure which integrates all the relevant information in the search for the best approach to choose a treatment option (Cimino,

2013; Forsberg *et al.*, 2013; Higgs, 2008; Nendaza & Perriera, 2012; Sniderman, *et al.*, 2013). Guidelines are set as a source for clinicians to offer recommendations for modalities and this is often the starting point for a clinician to clinically reason treatment options (Cimino, 2013; Forsberg *et al.*, 2013). However the pragmatic nature of clinical reasoning suggests it should be constructed on the examination of what may happen if the modality was not used (Artino *et al.*, 2014; Charlin *et al.*, 2012; Cimino, 2013; Cruz *et al.*, 2012; Custers 2013; Forsberg *et al.*, 2013; Higgs, 2008; Nendaza & Perriera, 2012; Sniderman, *et al.*, 2013). Furthermore, guidelines are set to be adapted dependant on the circumstances and requirements of the client you are treating. Overall, clinical reasoning remains fundamental to clinical practice, however due to the conflicting evidence surrounding the transferability of evidence into practice, it is often based on previous clinical experiences and clinicians' perceptions (Artino *et al.*, 2014; Charlin *et al.*, 2012; Cimino, 2013; Cruz *et al.*, 2012; Custers 2013; Forsberg *et al.*, 2013; Higgs, 2008; Nendaza & Perriera, 2012; Sniderman, *et al.*, 2013).

EBP can be defined as knowledge derived from a variety of sources that has been subjected to testing and has found to be credible (Higgs & Jones, 2000). It was formally introduced into clinical practice in the early 1990's (Jeffreys, 2015). EBP remains an imperative element for healthcare practitioners to ensure the highest and most effective level of treatment is provided; however, it is ever evolving and adapting (Sackett, 2000). EBP is often interpreted as the integration of the most current evidence into the clinical decision making process and it is paramount that EBP is a conscientious, explicit and judicious use of the evidence (Jeffreys, 2015; Rycroft-Malone *et al.*, 2004; Sackett 2000). EBP is advocated by professional clinical bodies across the globe such as National Institute for Clinical Excellence (NICE, UK) and Agency for Health Care Research and Quality (USA); these governing bodies advocate clinician's base their

care on the best possible evidence available (Jeffreys, 2015; Rycroft-Malone *et al.*, 2004; Sackett 2000). The implementation of EBP into clinical practice aims to enhance the care a patient receives through the choice of medical interventions, the influence of an evidence base helps to produce a systematic approach for clinicians, ensuring a consistency of treatment options and use (Jeffreys, 2015; Sackett 2000).

Ensuring practitioners are keeping and integrating current evidence in the forefront of their practice, allows the clinician to make informed decisions and be accountable for any modality that is chosen throughout the assessment or treatment process (Cullen Greiner, Greiner, Bombei & Comried, 2002). Introducing evidence and clinical guidelines into the healthcare field can be problematic, as conceptual frameworks must be derived from the highest quality empirical research (Grohl & Grimshaw, 2003; Kitson, Harvey & McCormack, 1998). With that in mind, the circumstances which ETT currently sit are that the evidence is inconclusive to its proposed benefits, however clinicians still opt to use the modality based on their previous experiences.

Although evidence can support the healthcare practitioners' decision process, researchers also claim the patients' preferences, and the clinicians' experiences and expertise also play a part to an effective EBP which could lend well to the modality of ETT (Jeffreys, 2015; Sackett 2000). Knowledge from past clinical experiences can influence EBP, due to the implicit and intuitive nature. Clinicians act upon their own practical knowledge and often disseminate their knowledge and past experiences to colleagues to inform future clinical practice whilst also identifying the patient needs to derive at the best treatment modality (Jeffreys, 2015; Rycroft-Malone *et al.*, 2004). Additionally, patient's preferences, knowledge and perceptions can also influence EBP by a means of evidence informed patient choice which has been integrated into clinical

decision making. An example of this is The Database of Patients' experiences which is an example of how past experiences can be linked to evidence (Rycroft-Malone *et al.*, 2004). Finally, EBP can also be related to local contexts such as social networks, performance data, audits and feedback from employers and patients (Rycroft-Malone *et al.*, 2004). This potential influence is not often recognised as EBP, however as previously discussed, has the potential to be explored in depth (Rycroft-Malone *et al.*, 2004; Sackett, 2000). True EBP can therefore be seen as an individualised, unique decision which aims to achieve the best possible treatment modality or intervention for that patient (Jeffreys, 2015).

2.5 Aims and objectives

Following this review of literature, it is apparent that there is no published research that has been made available investigating the perceptions or beliefs of trained clinicians into how and why ETT is used within their clinical practice. Due to the current literature reporting conflicting views and lacking a good level of validity on the effectiveness of ETT within MSK pathologies, this could cloud clinicians' judgement, their understanding, and affect their use of ETT in their clinical practice. Therefore, the aim of this study is to examine clinicians' beliefs and uses of ETT within their clinical practice with the specific objective of exploring clinicians' understanding of the evidence base and how that evidence base may influence their clinical practice. By investigating clinicians' beliefs towards ETT and also gaining insight into how clinicians view this conflicting evidence base, a picture can be formed of current understanding of the differing brands and efficacy, the image and use of ETT, and where research is specifically required within the field to best support an increasing awareness and utilisation within the clinical body and environment.

Chapter Three: Methodology

A mixed method approach was undertaken for this thesis, as the current literature available for clinician's perceptions and beliefs of ETT is under investigated. Therefore, by using this approach, it is thought to give a broader, more comprehensive outlook on the topic, to then subsequently enhance the richness of the data for this under explored field. By using questions in an online survey, a baseline can be gained and this can be built upon for the semi structured a to gain the theoretical underpinning.

3.1 Piloting

Six participants piloted the online survey prior to the online link going live (<https://www.surveymonkey.com/>) in October 2014. Three of the participants were ETT trained and three of the participants were not. Piloting was conducted to optimise the online survey and ensure that the online survey would terminate if participants were non-trained. Verbal feedback from the pilot suggested that the questioning style and suitability of the questions were geared towards the evidence base surrounding ETT, its use in clinical practice and the variations of specific tapes uses and changes were not required to enhance the survey. The non-trained clinicians confirmed the survey would not allow continuation onto the ETT specific questions; therefore the online survey could go live. Interviews were piloted to four academic ETT trained staff members from The University of Hull. Piloting of the interviews was conducted to refine the questions surrounding the evidence base and the use of ETT within clinical practice, and also to gain verbal feedback on whether the semi structured nature of the interview followed effectively and questioning was not biased in any way. Verbal feedback from the pilot suggested that the questioning style and suitability of the questions were geared towards

the evidence base surrounding ETT, its use in clinical practice and the variations of specific tapes uses and the semi structured nature suited the topic area of discussion.

3.2 Inclusion and Exclusion criteria

To be included in this thesis, participants had to be an active member of a professional body and had to have been trained or possess a qualification within the ETT field.

Participants were excluded from the online survey if they did not use ETT within their clinical practice or were not an active member of a professional body; they were also excluded if they withdrew from the process at any time. As the topic of ETT is niche and specialised, for the online survey, it was beneficial to identify trained clinicians' to ensure detailed responses could be gained. For the interviews it was important to enhance the richness of the collected online survey data and by conducting semi structured interviews, it gave the investigator the scope to be adaptable with the questioning and explore aspects within the discussion to gain further insight into clinicians' perceptions and beliefs on the use of ETT.

3.3 Participants

Active clinicians registered with a Professional body were asked to participate via a recruitment email sent by their professional bodies (Appendix A) which included an online survey link and participant information sheet. Table 3.1 outlines the number of participants from each body that completed the online survey.

Table 3.1 Clinical Professions of the online survey respondents

Professional body	Number of responses	Percentage of response
Graduate Sport Rehabilitator	15	32.6%
Physiotherapist	10	21.7%
Chiropractor	6	13.0%
Sports Therapist	6	13.0%
Osteopath	5	10.9%
Athletic Rehabilitation Therapist	2	4.4%
Occupational Therapist	1	2.2%
Podiatrist	1	2.2%

One hundred and twenty-two participants responded to the online survey however only forty-six (37.7%) completed all questions, with twelve consenting for follow up interviews. Seventy-six participants (62.3%) were disqualified from data analysis due to incompleteness of all questions or did not have a recognised ETT qualification. For the interviews, recruitment emails were sent out in January 2015 to the twelve trained ETT participants from the online survey who gave contact email addresses. Participants were briefed on the format of the interview and had the option to withdraw from the interview process following the briefing. Due to the withdrawal of participants (n = 11), active clinicians from the Sport Rehabilitation programme at The University of Hull, along with local graduates and associates were purposely sampled for follow up interviews. The clinicians who were interviewed consisted of GSR's (n = 4), Physiotherapists (n = 4) and Sports Therapists (n = 4), of which two from each profession had a recognised ETT qualification and two did not.

3.4 Ethical Approval and Time Period:

Full ethical approval was gained via The University of Hull Ethics Committee in September 2014 (Appendix B) for the online survey. The online survey went live on the 9th October 2014 after piloting to six clinicians, and closed on the 09th December 2014. The recruitment email consisted of the studies purpose, how results would be disseminated and the online survey link. The participant information sheet was added as an attachment (Appendix C). Informed consent was gained when participants completed all questions on the online survey and this was made clear in the participant information sheet prior to the first question, any incomplete online surveys meant that informed consent was withdrawn and that data could not be used.

For the interviews, emails were sent out on 20th February 2015 to the purposely sampled participants (n = 12). Participants were electronically briefed and informed on how the interview was going to be set out, participants had an option to withdraw from the interview process at any point and their data be destroyed. All trained participants were trained in KT through Kinesio UK, varying levels from fundamentals (level 1 and 2) through to certification level. Interviews were conducted in a quiet office space in person (n = 11) or via telephone (n = 1) to allow privacy and no distractions to the interviewer or interviewee and recorded using a digital voice recorder (Olympus WS-650S, China).

3.5 Materials and Procedure

3.5.1 Online survey

The online survey (Appendix D) was developed using Survey Monkey (<https://www.surveymonkey.com/>). The participant information sheet was used as the opening web page of the online survey, although this was sent out in the recruitment email, it was vital participants were explained the procedures again to ensure the purpose of the online survey was understood, why participants had been chosen, what the online survey would involve and disclosed information regarding confidentiality and data protection. It was also outlined that informed consent would only be given by the respondent once all twenty one questions had been completed and if all were not completed then data would be destroyed. In total there were twenty one questions, of which consisted of a mixture of dichotomous, open ended, closed and nominal scale questions. Open questions or long answer questions were used to allow the participant to devise their own response to the question, aiming to gain more detailed responses, closed questions were used for questions relating to participants training and ETT usage and respondents are given a category or response to choose from (Wright, 2006). Nominal scale questions were used to gain information on how participants viewed the evidence base of ETT and its usage in clinical practice. Dichotomous questions were used to one of two possible answers for example a yes or no answer or true and false (Wright, 2006).

The content of the questions involved details regarding the length of training in ETT, the branding of the ETT used in the clinicians practice and the amount they use ETT. Questions asked about the population group the clinicians worked with and what ETT was used for with that specific population group. Longer answer questions investigated

perceptions surrounding how clinicians clinically achieve their desired aims by utilising ETT and their perceptions of the current evidence base, and the how clinicians work to achieve their outlined aims or goals. This was an important element to the criteria, as responses would be based on formal training and that clinicians would be active in continued professional development as being a member of a professional body, this is a requirement for professional bodies. This was checked in the penultimate question of the online survey.

3.5.2. Interviews

Interview questions were devised based on the results from the online survey and elements which were not expanded on in the long answer questions. Semi structured interviews were conducted to ensure data was comparable and reliable with questions standardised and the same open ended questions asked to all interviewees consisting of questions focused on the evidence base surrounding the use of ETT in clinical practice (Appendix E). These were chosen based on the scope of the interview to be flexible and adaptable dependent on the answers gained, yet specific pre-determined questions were included. Open ended questions were utilised to allow the interviewee to express their views and permitting the interviewee to voice new ideas that may not have arose from the online survey (Wright, 2006). Furthermore, with a semi structured interview, there is the advantage of the interview being objective, whilst gaining the systematic understanding of the interviewee's in depth opinions and their reasoning behind a statement (Wright, 2006). Once interviews had taken place and transcribed verbatim by the investigator, they were sent via email to the participant to allow them to check the accuracy of the data. If at that stage any issues with regards to accuracy of the data were highlighted, participants were required to inform the investigator within one week of

receipt, ensuring responses were fresh in the participants mind and that any changes could be made promptly. All personal details were removed and any references to participants by name were replaced by a pseudonym. Participants were also informed that direct quotations would be used within the current project; however no reference to identities would be made.

3.6 Data Analysis

3.6.1 Online survey

Data was extracted from Survey Monkey where quantitative data were collated into tables and figures to comparatively look at the data set. The qualitative data from the open long answer questions were grouped together using descriptive characteristics such as views on the evidence and influences from their view of the evidence base, to establish if any running themes were present to then gauge and prepare interview questions.

3.6.2 Interviews

A theme- centered analysis also known as thematic analysis (Braun & Clarke, 2006; Gale, Heath, Cameron, Rashid & Redwood, 2013) was employed which took a semantic approach, where themes were identified from the “explicit or surface meanings of the data” (Braun & Clarke, 2006, p 84). The interview data analysis firstly followed a number of procedures identified from Gale *et al.* (2013) known as the Framework Method. Verbatim transcription of the interviews were conducted and read through several times to acquaint the investigator to the common themes. Following Braun and Clarke’s (2006) guidelines for conducting thematic analysis, data was then initially

coded through NVivo10 (Windows) software and organised into nodes of common trends. NVivo10 allowed the transcript to be coded line by line or by paragraph describing what had been interpreted as important or fitting a theme such as beliefs, training or evidence based opinions. The transcriptions were then coded by another researcher who had not seen the responses of the interviewees, however this secondary coding was based on the initial themes identified by the principle investigator and used to examine the coding accuracy. These codes were organised into themes (Appendix F) to then compose higher order themes between the trained and non-trained clinicians (Tuckett, 2005), to help explore any specific relationship between the responses of the trained and non-trained clinicians (Appendix G).

3.7 Researcher bias

It has to be acknowledged that there was the potential for researcher bias within this study, as the investigator was a high level ETT practitioner, who devised the questions for both the interviews and the online survey, transcribed and analysed both data sets. This potential bias could be linked to socialisation and how peers learn from others. However, every attempt was made to avoid being bias towards the data set such as another researcher dual coding the interviews. Furthermore, semi structured interviews were employed to allow for a greater participant led procedure and to eliminate a possibly level of influence from the primary researcher.

Chapter 4: Results

4.1 Online Survey

4.1.1 ETT use in clinical practice

Figure 4.1 illustrates the number of participants who solely use ETT, both ETT and athletic taping techniques or solely athletic taping techniques within their clinical practice. The total number of participants presented in this figure, includes individuals that did not complete the full questionnaire as they were unable to due to selecting the use of athletic taping only (n=4). Participants' branding trends within their clinical practice are presented within Figure 4.2. Kinesio Tape was the most popular brand n = 18 (39.1%) used by the trained clinicians. Figure 4.3 illustrates the various branding trends outlined within figure 4.2 and in which clinical environments they are predominately used in. As shown in figure 4.3, Kinesio Tape, Rocktape and Mueller Kinesiology was utilised by the same amount of respondents in sport (n = 7), however Kinesio Tape was the most predominant brand for all the other clinical environments.

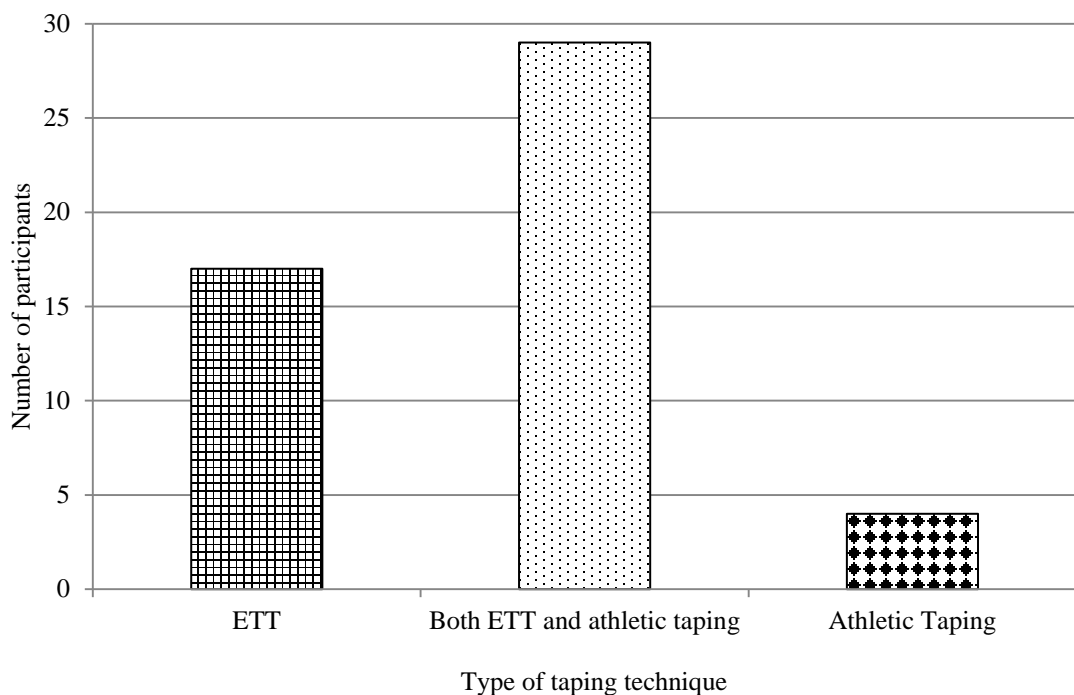


Figure 4.1: Frequency of taping techniques used amongst clinicians.

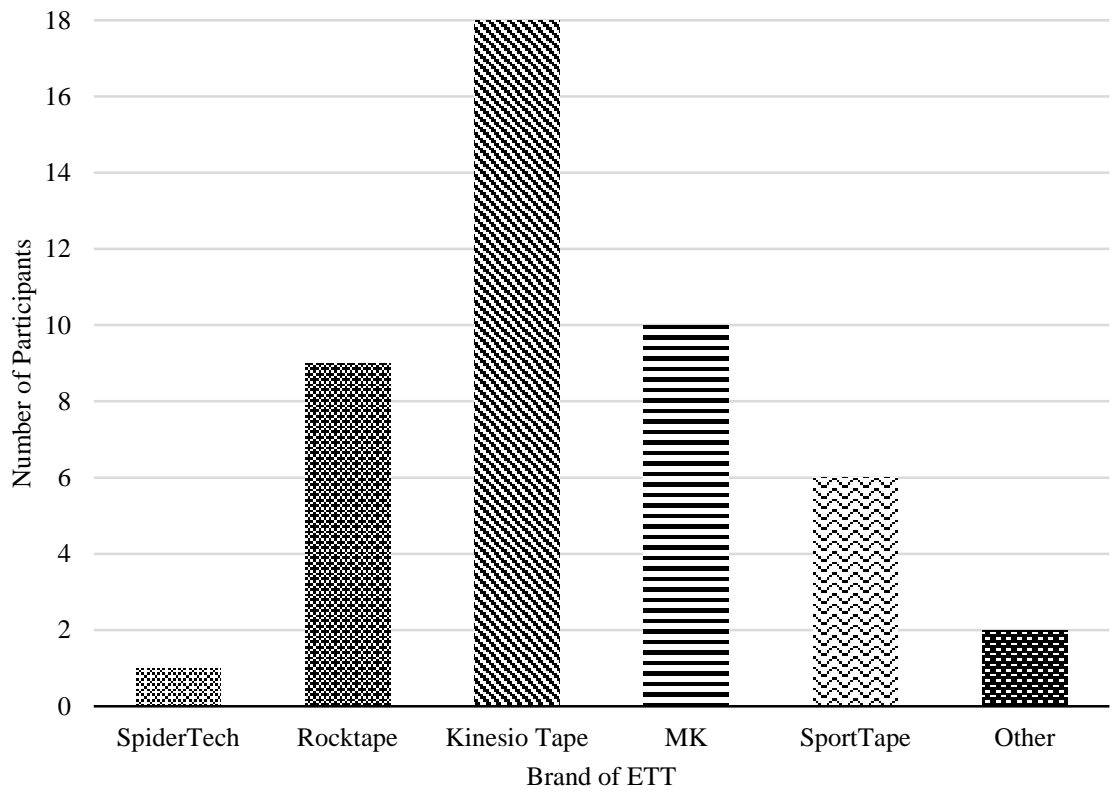


Figure 4.2: Participants' branding choices within their clinical practice.

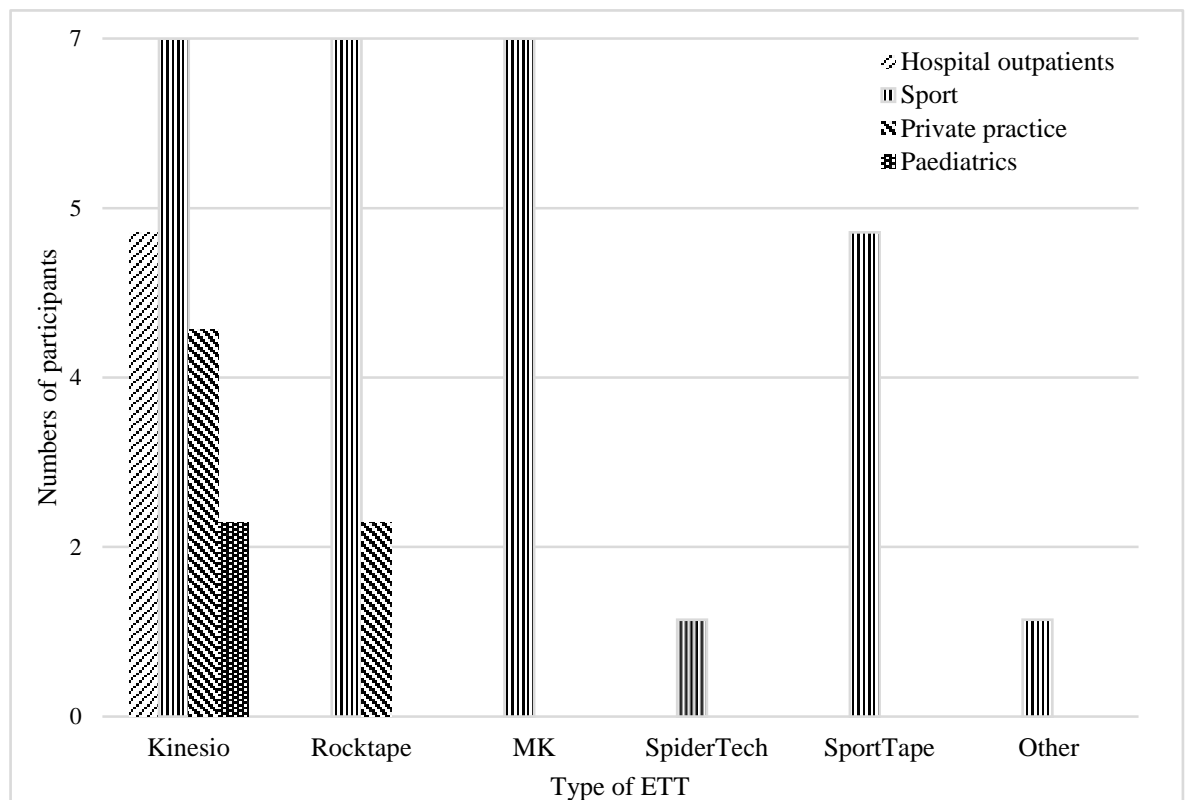


Figure 4.3: Branding use of ETT in different clinical environments.

Participants were asked to subjectively score the list of population groups (MSK, Athletes, Lymphoedema, Paediatrics, Elderly and Neurological) to appraise them for which population group they work most with clinically (one being the primary group of clients though to six being the least popular group of clients clinicians treat or not at all). Table 4.1 demonstrates the primary, secondary and tertiary population group's clinicians utilise ETT with, as a treatment modality.

Table 4.1: Populations clinicians utilise ETT as a treatment modality with.

Population group	Primary	Secondary	Tertiary
Musculoskeletal	n = 23 (50.0%)	n = 15 (32.6%)	n = 3 (6.5%)
Athletes	n = 17 (37.0%)	n = 14 (30.4%)	n = 3 (6.5%)
Lymphoedema	n = 3 (6.5%)	n = 2 (4.4%)	n = 8 (17.4%)
Paediatrics	n = 2 (4.3%)	n = 1 (2.2%)	n = 9 (19.6%)
Elderly	n = 1 (2.2%)	n = 3 (6.5%)	n = 7 (15.2%)
Neurological	n = 0	n = 0	n = 13 (28.3%)

Table 4.1 outlines the most predominant population group clinicians worked with was MSK (n = 23), this again was the most predominant group for the secondary group of clients (n = 15). The Neurological population group was not ranked as primary or secondary group, but was the most popular tertiary group (n = 13). Population group four to six are not reported, as the subsequent online survey questions focused on the clinicians' primary, secondary and tertiary population groups.

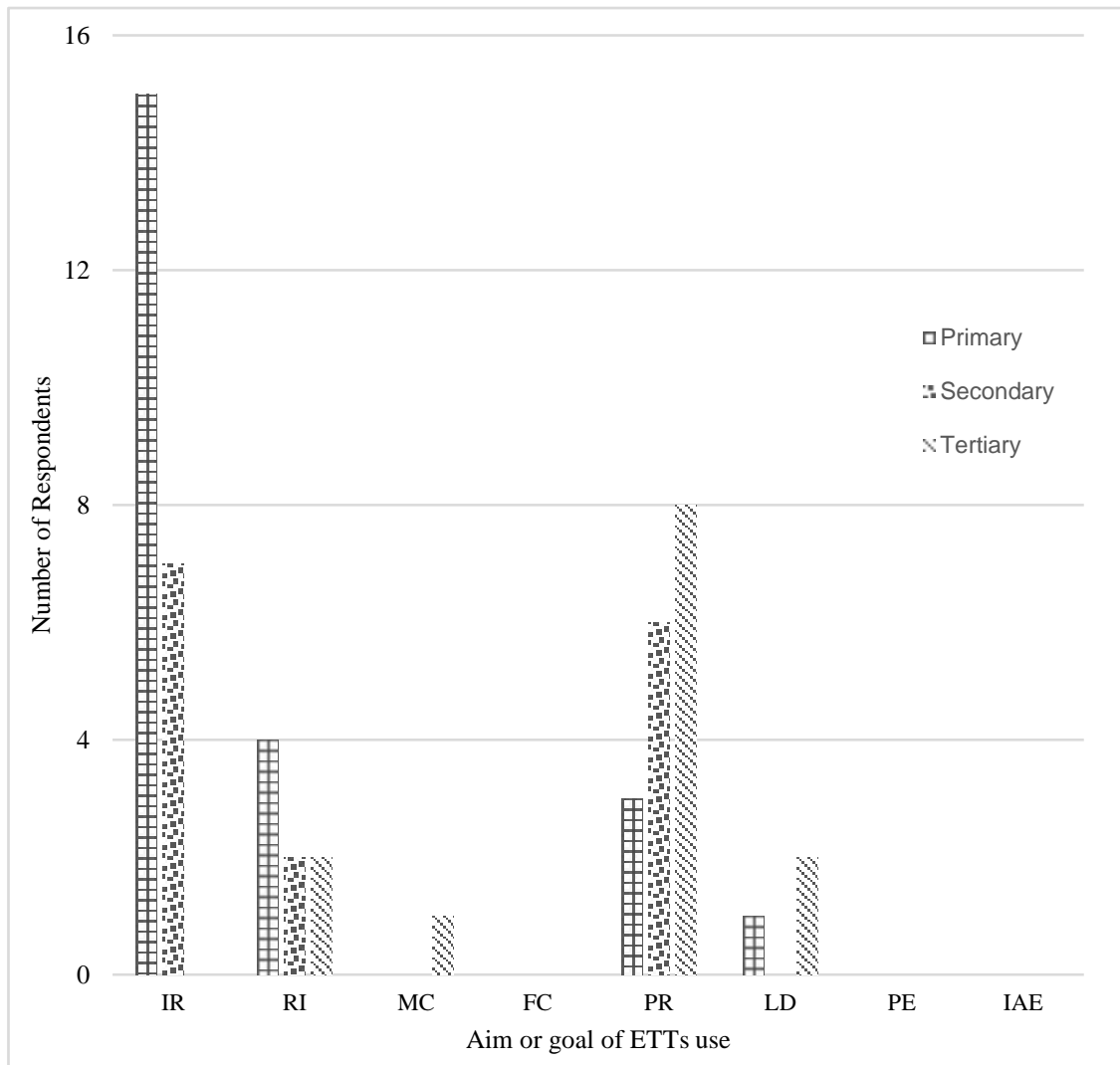


Figure 4.4 Clinicians main aim/goal when using ETT in their primary (MSK), secondary (MSK) and tertiary (Neurological) population groups.

Figure 4.4. Key of terms
IR= Injury rehabilitation
RI= Reduction of Inflammation
MC= Mechanical Correction
FC= Functional Correction
PR= Pain Reduction
LD= Lymphatic Drainage
PE= Performance Enhancement
IAE= Increase athletic endurance

Figure 4.4 illustrates the aims or goals clinicians stated they use ETT for within their primary, secondary and tertiary populations. The main aim or goal clinicians utilised ETT with in their primary population of MSK patients was for injury rehabilitation (n =15). This was again the main aim for the secondary population group (n = 7). Figure 4.4 demonstrates that for the Neurological population group which was ranked as the tertiary group, pain reduction was the most popular aim or goal (n = 8).

4.1.2 Long answer responses surrounding ETT's use, the evidence base and how clinicians view its effectiveness.

During the online survey, long answer questions explored how clinicians viewed the evidence base surrounding ETT, how this evidence influenced, if at all, their clinical practice and why clinicians believed ETT worked in achieving their previously stated main aim or goal with that population group. These questions were repeated for the primary, secondary and tertiary population groups (MSK, Athletes, Neurological, Lymphoedema, Elderly and Paediatrics).

Each ranking of population group (primary, secondary, tertiary) was analysed separately however a number of similar themes were identified across the three population groups such as the lack of supportive evidence surrounding ETT:

“It is very disappointing that there is not more clear scientific evidence. Because of the lack of evidence some clinicians choose not to use it. Almost never do you read a clinical paper that says something works for diagnosis 100% of the time.”

[Respondent 101]

“I have heard of very little positive research in the use of ETT.” [Respondent 43]

“I am aware about the recent researchers but there are lot of methodological flaws in addition to conflicting results.” [Respondent 12]

“I believe the evidence base exists but there is still a lot of contradictory findings that cause confusion.” [Respondent 33]

“As with many modalities within our field, the evidence base is quite poor, being mainly hypothetical.” [Respondent 7]

“Quality of the evidence base is poor, due to: small sample sizes, the difficulty of "blinding", the huge range of recommended taping techniques, differences between brands of tape, the side range of injuries for which ETT is used”. [Respondent 3]

“There is some evidence available but its effects vary according to the individual patients and their complaints. Clinical judgment plays a big part in the decision of who to tape/not to tape”. [Respondent 27]

“A lot of mixed opinion on how effective the tape is, some influence on time to peak torque but a large amount of placebo surrounding the use of the tape”.

[Respondent 56]

“There’s a huge need of good quality research to support the use of KT. Hopefully we’ll have that soon”. [Respondent 49]

“There is not much evidence available with the methods I use but with my clinical decision making and reasoning I got good results”. [Respondent 62]

Respondents were asked to comment on how the evidence base influenced their clinical practice with respect to the population groups they worked with. Respondents used ETT frequently irrespective of any perceived clear evidence base, for example:

“Encourages me to use more frequently on clients, as it is not invasive it is often the first method I will use before progressing to others”. [Respondent 2]

“Because I get good feedback about the tape I use it frequently. The lack of scientific research in the area would not stop me from using it”. [Respondent 62]

“We use it despite what is or is not published”. [Respondent 17]

“As I know it’s successful I have no problem in recommending to clients.”

[Respondent 82]

“Good feedback from the athletes that it is working to be shown rehab cycles that it is reducing recovery times.” [Respondent 99]

“It definitely influences my practice as I want to provide the best possible treatments to my patients. With evidence, knowledge and outcomes will be enhanced. I feel it is necessary to have evidence behind a treatment to show its effectiveness. However, each patients is different and this must be taken into account through clinical reasoning. Ongoing research is highly important to provide improved patient care.”

[Respondent 4]

Although clinicians continue to utilise ETT regardless of their perceptions of the evidence base, a level of concern and scepticism was apparent through responses, for example:

“I use it with some scepticism and don’t use it widely. It is an addition to my treatment rather than the focus.” [Respondent 44]

“I am very sceptical of its benefits and believe there is a big placebo effect. I have witnessed patients experiencing some pain reduction when used on an acute whiplash and increased function when used with muscle strains.” [Respondent 61]

“Use with caution and don’t apply the tape without a reason. It is not a substitute for other treatments, just another option.” [Respondent 11]

“I probably would use it more if the evidence base was stronger, assuming the evidence supported its use”. [Respondent 6]

There was also not a clear agreement of why ETT is utilised, for example:

“ETT works by providing support to tissues and aiding in the mechanical pump for oedema reduction and muscle firing”. [Respondent No 33]

“ETT allows them to return to sport sooner. ETT has worked on the majority of my patients to reduce their pain, improve mobility and psychologically makes patients take their mind off their injuries”. [Respondent No 13]

“Gate Control is the only theory which could justify its use. I am aware about the recent researches but there are a lot of methodological flaws in addition to conflicting results”. [Respondent No 20]

“Well the epidermis is lifted by the tape, resulting in an increased in blood and lymph flow which in turn can facilitate the rehabilitation process for example increasing range and decreasing pain” [Respondent No 71]

“It helps to reduce pain and inflammation enabling other treatment to commence quicker. The variable elasticity provides support or muscle activation/deactivation to reinforce the treatment objectives”. [Respondent No 29]

Finally, when questioned how ETT can work in achieving their previously stated aim or goal with their population groups, clinicians' responses heavily correlated with the Kinesio tape brand's mission statements. For example:

“Kinesio tape initially aids in the reduction of local inflammation and improve lymphatic drainage to the area. It can then be used to improve proprioceptive feedback through mechanical and functional corrective techniques thus aiding injury rehabilitation.” [Respondent 4]

“ETT works by providing support to tissues and aiding in the mechanical pump for oedema reduction and muscle firing” [Respondent 66]

“It is my understanding that the pull on the skin from the tape can add additional proprioceptive and thus enhance function” [Respondent 35]

“I find it takes less time to apply than ridged tape and can be worn for a number of days therefore the client gets a longer treatment period to reduce their pain”.

[Respondent 39]

“The adhesive and the tape facilitates or inhibits motion by the stimulation of the nerve endings in the dermis. This stimulation is transmitted through the neural pathway with the result that the area is facilitated in its action or inhibited”. [Respondent 49]

In summary, from the online survey, it was apparent clinicians had conflicting views surrounding ETT and its evidence base, however, clinicians still felt despite the lack of evidence surrounding ETT, they would still utilise the tape in their clinical practice. It was clear from the responses that the perceptions of ETT and its use in clinical practice is positive and based on the practice based evidence clinicians had witnessed in their clinical environment or heard from colleagues. Furthermore, it was clear that the reasons clinicians believed the tape worked was based on the specific brands' mission statements and content taught on specific training courses, for example Kinesio Tape courses. Unfortunately there were not any clear trends within the data relating to the participants employment, what branding of ETT was used or their training backgrounds in the online survey short or long answer questions.

4.2 Interviews

Twelve clinicians were purposively sampled for interview, six ETT trained and six non-trained. Trained clinicians were as follows: GSR (n = 2), Physiotherapist (n = 2) and Sports Therapist (n = 2). Non-trained were as follows: GSR (n = 2), Physiotherapist (n = 2) and Sports Therapists (n = 2). Two overarching themes were identified from the interview process, based around the interview questions which were Efficacy of ETT and ETT within clinical practice.

4.2.1 Efficacy of ETT

Efficacy of ETT encapsulates the respondents' judgments on ETT, which encompass views on evidence base, the understanding of the effectiveness and failures with ETT. While all respondents, trained and non-trained, agreed that ETT is effective in treating MSK pathologies and injuries, clinicians' viewed clinical experience as the key to the

success, with clinicians stating the evidence base only highlights the overall effectiveness of ETT in certain MSK pathologies. Trained clinicians are therefore, in view of the lack of conclusive evidence, utilising ETT under their treatment umbrella based on their previous clinical experience. The consensus of the effectiveness between the professions or the environment clinicians worked in did not differ, showing that whether the clinicians were trained as a GSR, Physiotherapist or Sports Therapist, there was an agreement that although evidence underpins treatment modalities, there is a requirement to use practice based evidence, clinically reason its use and adapt the use to individual patient needs. For example:

“Currently, I think the evidence base is sparse to be honest...and limited. With that being said, it does not stop me using ETT and I think with anything in MSK you have to make a clinical judgement and clinically reason its use to your client and although the evidence is not 100% conclusive, I think it should be used in clinical practice as I have seen its effectiveness with numerous clients” [Interviewee 7- trained].

“Although evidence underpins most of our modalities within this healthcare profession, there is still an element of what has worked in your experience with patients before and going back to the successes for example, yes there is no evidence to suggest it works in ACL rehabilitation, but the numerous patients I have had over the last 6 years of ETT training it has drastically improved their outputs and rehabilitation process” [Interviewee 8-trained].

“I think the evidence is not strong enough for them to use it, I don’t think...they are going on experiences rather than the scientific evidence” [Interviewee 6- non-trained].

“I think the evidence is quite kind of in its primary stages as a lot of case studies or small studies and hasn’t been used on large populations, but I think anything MSK wise some people respond, some people don’t. I can see why people might not think its worthy of anything more than prophylactic taping does...I think there just isn’t enough on different injuries that all back each other up saying that the tape is effective”

[Interviewee 2- non-trained].

When considering the understanding of the effectiveness of ETT, responses centered around the mission statements made by the KT brand of ETT of lifting the epidermis and interstitial space to decrease pain and improve lymphatic drainage. All clinicians trained or non-trained had a similar KT biased view which was therefore only providing understanding based on what the company has made available online and via course material. For example:

“I think the drainage and postural aspects are a big aspect to the tapes effectiveness”

[Interviewee 11-trained].

“I think the tape I extremely effective in decreasing pain through correction and decreasing pressure within the epidermis. The tape mimics the skins elasticity and lifts the erm...epidermis allowing increased blood flow and lymphatic flow and decreasing pressure which then decreases pain and swelling” [Interviewee 7- trained].

“It lifts the skin and increases the interstitial space to allow normal movements of fluids throughout the body. By decreasing the pressure and...increasing the fluid flow would then allow an improvement in...range and also movement without pain.

[Interviewee 12-trained].

“As it creates erm...space between the muscle and surrounding features to allow an increase in blood flow and erm...lymph flow. It takes like....some of the weight of the muscle. [Interviewee 6- non-trained].

“From what I understand...it works within the epidermis and sends signals to the brain to do whatever you have applied...like proprioceptive feedback to correct posture for example” [Interviewee 4-non-trained].

“From what I understand, ETT is a greatly improved tape to standard taping techniques that has increased the physiological effects. The tape lifts the first layer of skin to allow an increase in blood flow...this can help with removing waste products”

[Interviewee 3-non-trained].

One common failure was experienced by all trained clinicians, all clinicians cited problems with ETT and body hair. For example:

“when you apply the tape over hair erm...it didn't really stay on very well, so now I sort of trim the area or even shaved to make sure the tape stays on”

[Interviewee 9-trained].

“I would say that applying the tape to any areas where there is a lot of hair obviously proves very difficult and it doesn’t stick!” [Interviewee 11-trained].

“I think...the downside of working within the sporting arena with Kinesio Tape is that you sometimes need to use tape adhesive dependent on two factors...erm...1. Sweat and 2. Body hair. Make sure there is limited body hair and skin preparation is key for me”
[Interviewee 12-trained].

This was also an issue for one non-trained clinician who had heavily seen its use on a University placement. For example:

“It doesn’t erm...stick well to males...where body hair is present”
[Interviewee 6-non-trained].

A common theme that arose with the clinicians whether trained or non-trained is they had very similar opinions, again relating heavily to KT claims, when it came to how the branding of ETT can relate to the effectiveness and how KT is the preference for clinicians and clients. For example:

“I think there is a difference between the brands. It seems Rocktape are more performance based whereas Kinesio seem more preventative, rehabilitation and a lot more pathologies such as lymphoedema but that’s just from what I have read. Like with anything you can get cheaper brands to make sure the competitive market is there for companies, but who is to say that they are the same grading’s as the bigger brands...they probably aren’t, but there isn’t any research to back that up!”
[Interviewee 4-non-trained].

“I think there is slight differences between the brandings otherwise there wouldn’t be them all. Like there must be some variation in the properties...I guess. At the rugby club we have both Kinesio and Rocktape...they both look the same but Kinesio seems to be thinner and like...better quality just by the touch, players prefer it too”

[Interviewee 6-non-trained].

“ I have used number of Kinesio related tapes and the standard official one is much more adhesive to I don’t know maybe a Vulkan or Rocktape product where the adhesiveness is just not as good quality, therefore effecting the technique effectiveness”

[Interviewee 8-trained]

“I think the cheaper brands that I have used before do not have that quality to them to last or even be effective at all...I also think Rocktape is more performance based rather than injury prevention or treatment” [Interviewee 9-trained].

4.2.2 Clinical use of ETT

The clinical use of ETT theme captured respondents’ views of why the tape is often used within MSK, specifically addressing elements of external influences to practice, awareness, increased usage and enhancement of professional practice. All respondents expressed views relating to the influence of the media not only on clinicians, but also on patients or athletes receiving treatment. However, some clinicians felt that this external influence from the media should not warrant the request of ETT as part of a treatment session from a client and clinicians’ evidence base and knowledge should underpin its use. For example:

“I think they see it on TV and think because they see someone famous using it that they need to be using it rather than the science behind why it’s used”

[Interviewee 2-non-trained].

“Apparently they had seen it in a fitness magazine and thought it might be good!

[Interviewee 3-non-trained].

“I think the media has played a big part in this where athletes see other high level athletes wearing the tape. Also they have seen the tape on TV and not necessarily with the underpinning knowledge as to why the tape is being applied”

[Interviewee 8-trained].

“I think people think if the professionals are wearing t then it must be good stuff, without actually knowing the theory behind why they are wearing it or what it is actually doing at a more cellular level. [Interviewee 10-trained].

“I don’t think that the knowledge base is out there enough in the general public I think they base it on famous people who you see on TV like in football, athletics and I think this year’s tennis had a lot of players using it...so I guess it’s not an educated request it’s because their favourite sports star has worn it” [Interviewee 11-trained].

“I think people are aware of the tape due to the elite athletes such as Andy Murray, Serena Williams and David Beckham who wear it and when they are seen in the sporting arena, people look and research what it is that they are wearing”

[Interviewee 12-trained].

Throughout the interviews, there was an agreement that those trained in ETT felt their clinical practice has been enhanced, the use of the tape has increased and influenced practice in a positive way, however often utilised in conjunction with other techniques and modalities. For example:

“I think I have increased my use of it as a treatment modality....hmmm, however, I do use it in conjunction with other hands on treatments” [Interviewee 7-trained].

“It’s has enhanced my rehabilitation techniques and treatment options where taping techniques are very much common now because of the effectiveness of certain KT processes such as mechanical correction and muscular facilitation of the tape. It allows me to combine easy application with no time at all involved alongside proprioceptive handling techniques or mobilisation with movement...allowing my clinical outcomes to be more effective [Interviewee 8-trained].

“It’s added something into my toolbox that I can use whereas before I could only use something like massage or mobilisations” [Interviewee 9- trained].

“It has influenced my clinical practice in a positive way...it’s a great treatment modality for the end of a session so the client can feel the benefit as they leave the clinic as well as a few days post application. I also find it compliments other treatments such as mobilisations and stretching” [Interviewee 10-trained].

“My clinical practice has been influenced in a positive fashion and I have used it in conjunction with other treatment options such as mobilisations and electrotherapy, but it was also effective by itself. I think it has made me a better clinician as it has given me extra modalities to use” [Interviewee 12-trained].

The non-trained clinicians also highlighted that incorporating ETT into their future clinical practice to be able to compete with trained clinicians, in turn possibly enhancing their future professional development. Non-trained clinicians frequently stated the reasoning behind this was due to the ever growing demand within the public eye of ETT. For example:

“I have often thought of training in ETT would be useful, definitely with its extensive use in sport as well and often what patients or clients are looking to have”
[Interviewee 1- non-trained].

“it would be something I am interested in as I think athletes or clients are more aware of it and want to know you have it in your skills or they have heard something about it and want to try it out” [Interviewee 2 -non-trained].

“I have often thought about using ETT and becoming trained in it...not only as an enhancement for me but also because a lot of people have asked for it” [Interviewee 4-non-trained].

However for the trained clinicians, these comments on influencing clinical practice and wanting to progress further has been based upon their perceived apparent lack of conclusive evidence surrounding ETT, and their opinions are purely down to the desire to enhance their clinical practice as a healthcare professional, showing that ETT is becoming a prevalent intervention for clinicians to be offering and developing with. For example:

“I definitely think it has enhanced my CPD as I use it frequently. I would like to in future complete my examination” [Interviewee 9-trained].

“I think the level 1 and 2 allows you to learn the basics but the level 3 enables you to enhance your knowledge and exposes you to the use of tape for more complicated conditions. I am definitely glad that I chose to take the course as part of my CPD” [Interviewee 10-trained].

“CPD is an integral part to any health care profession and I think that if you don’t keep up to date you will clinically fall behind your peers and then I think your clients will suffer from that by you not being able to provide an effective session” [Interviewee 11-trained].

From the interview process, it was apparent clinicians, regardless of training, had consistent views surrounding ETT, its effectiveness, its evidence base and its use in clinical practice. Due to external influences such as the media and professional sportspeople wearing the tape, the usage within clinical practice has increased, regardless of the lack of supportive evidence base available to clinicians. These findings agree with and support the answers from the online survey, which this positivity was based on practice based evidence rather than evidence based practice.

Chapter 5- Discussion

The central aim of this thesis was to investigate how ETT is being currently utilised in clinical practice. Specific focus was given to the types of ETT used, the population groups that the ETT is applied to, the main therapeutic aims behind its application, and clinicians' views of the evidence base surrounding the modality. This Chapter will cover both data elements in combination.

The key findings of this thesis concluded ETT is utilised alongside athletic taping, rather than a standalone technique, with the use of ETT subjectively constructed on clinicians' practice based evidence alongside an awareness of the evidence base. Clinicians were predominately working within the field of MSK with the main aim being injury rehabilitation. Follow up interviews supported the online survey results and concluded clinicians used practice based evidence to rationalise the use of ETT in their practice rather than evaluating the current evidence base. Furthermore, clinicians' opinions focused on the effectiveness of the tape, which heavily correlated to the claims of the KT brand of ETT, this could be due to the trained clinicians being trained in this specific brand.

5.1 The use of Tape within clinical practice

5.1.1 Categories and brands of tape used

63.0% of online survey respondents stated they used a combination of ETT and athletic taping, with 37.0% using ETT as a standalone technique (Figure 4.1, page 46), this could be explained by the current conflicting evidence available to clinicians surrounding ETT, and how ETT is not widely supported in clinical practice as a

standalone modality (Carmo Silva Parreira *et al.*, 2013; Mostafavifar *et al.*, 2012). Both athletic taping and ETT have been linked with the prevention and treatment of joint and muscle related injuries (Abián-Vicén *et al.*, 2009; Bassett *et al.*, 2010; Sawkins *et al.*, 2007; Williams *et al.*, 2012). Research states in spite of its popularity and widespread clinical use, conflicting evidence exists to recommend ETT as a standalone modality for the treatment and prevention of MSK pathologies, and could account for why clinicians are still opting to use both athletic taping and ETT (Carmo Silva Parreira *et al.*, 2013; Kalron & Bar-Sela, 2013; Montalvo *et al.*, 2014; Mostafavifar *et al.*, 2012; Raymond *et al.*, 2012; Williams *et al.*, 2012). ETT is described by manufacturers as being non-restrictive of ROM (Kinesio UK, 2014; Rocktape, 2014), unlike athletic taping (Sawkins *et al.*, 2007), highlighting the different roles the tapes are possibly being utilised for when managing MSK pathologies, allowing clients to carry out activities of daily living and movement without having the constraints of athletic tape. ETT trained clinicians commented in the interviews that ETT was preferred due to the longevity and comfort for the clients

“ 1. time it takes to apply a taping technique is significantly less as opposed to using the traditional zinc oxide or EAB or McConnell 2. the longevity of this type of tape seems to be longer than traditional tapes 3.using less tape compared to traditional tapes has also been more comfortable for the patient so using say 1 strip versus half a roll of your typical zinc oxide tape has been more comfortable for the patient from a patient feedback perspective” [Interviewee 7-trained]

Non ETT trained clinicians in the interviews, voiced that athletic taping is used extensively in sport in comparison to ETT. Non trained clinicians highlighted its main uses were for post injury rehabilitation and for a protective element within their clinical

practice. However it was stated by non-trained clinicians that ETT would be beneficial to train in due to its increasing prevalence:

“even though personally I do believe there should be more of an influence on recovery for outpatients with the use of tapes, such as ETT.” [Interviewee 3-non trained]

“Erm yes I have often thought training in ETT would be useful [pauses] definitely with its extensive use in sport as well and often what patients or clients are looking to have.”
[Interviewee 1-non trained]

The online survey established the most prevalent and widespread ETT used within the clinical field sampled was KT 39.1% (Figure 4.2, page 47). Accessibility and availability of the training courses (Stagnitti, Schoo, Reid & Dunbar, 2006) and the tape may be a factor for this finding within the online survey, as the ETT courses are dominated by the KT brand with over 4,000 United Kingdom based clinicians being KT trained (Morris *et al.*, 2013). This too was highlighted within the interviews where all trained clinicians were KT trained, however this was purposely sampled due to the withdrawal of participants resulting in a possibility for an element of bias. For future studies, interviewing clinicians trained in different ETT brands would allow a greater and more varied set of responses to those achieved in this study, which were heavily related to the mission statements of the KT brand. There was awareness from both trained and non-trained clinicians in the interviews surrounding the different brandings of ETT that supported the online survey results

“I think there is a difference between the brands. It seems...Rocktape are more performance based whereas Kinesio seem more...erm... preventative, rehabilitation and for a lot more pathologies such as lymphedema but that’s just going on what I have read online and speaking with colleagues ...and also... like with anything you can get cheaper brands to make sure the competitive market is there for companies, but who is to say that they are the same grading’s as the bigger brands...they probably aren’t but there is no research to back that up!” [Interviewee 4- non trained]

“At the rugby club we have Kinesio tape and Rocktape...they both look the same but Kinesio seems to be thinner and like...I don’t know if I can say this...but...better quality just by the touch, players prefer it too.” [Interviewee 6- Non trained]

... also in terms of manufacturers erm the Kinesio UK is the standard official one
[Interviewee 8- trained]

5.1.2 ETT use within the clinical environment

When investigating the relationship between the brands of ETT and the environments they are used in (Figure 4.3, page 47), there was an equal distribution in the sporting environment between the brands of ETT, KT (n = 7), Rocktape (n = 7) and Mueller Kinesiology (n = 7); all are specifically marketed and promoted within the athletic and sporting arenas and are widely available within the public domain (Kalron & Bar-Sela, 2013; Sadeghi & Vaziri Rad, 2012). Furthermore as discussed in Chapter 2, certain brands affiliate themselves with recognisable and professional sporting teams and events, such as Team GB and The Wimbledon Championships (Kinesio UK, 2014;

Morris *et al.*, 2013; Mostafavifar *et al.*, 2012; Rocktape, 2014) highlighting the way the tape is marketed to the general public and how it could increase peoples influence of ETT's use in clinical practice. Furthermore, to solidify this claim further, it is clear from the results that how the media can influence the popularity of ETT and increase its use, as both trained and untrained clinicians commented on the influence that high level athletes wearing ETT in televised sporting events has both on perceptions of effectiveness and impact on clinical choices within practice not only to the clinician but also the client. Both trained and non-trained clinicians cited the influence that the media has, on both a clinical and public perspective for example:

“I think they see it on TV and think because they see someone famous using it that they need to be using it rather than the science behind why it's used.”

[Interviewee 2-untrained].

“I think the media has played a big part in this where athletes see other high level athletes wearing the tape. Also they have seen the tape on TV and not necessarily with the underpinning knowledge as to why the tape is being applied” [Interviewee 8-trained].

“I don't think that the knowledge base is out there enough in the general public I think they base it on famous people who you see on TV like in football, athletics and I think this year's tennis had a lot of players using it...so I guess it's not an educated request it's because their favourite sports star has worn it” [Interviewee 11-trained].

This poses the question of whether the actual pressure on the clinician to become trained or utilise ETT, is from public perceptions and/or demand fuelled by the media's and

sponsorship influence, therefore disregarding clinical judgement rather than the acknowledgement of EBP.

Within the hospital environment, clinicians utilised KT (n = 5) over the other ETT brands (Figure 4.3, page 47), this could be linked to the affiliation of certain trusts of the National Health Service with the brand KT (Salisbury, Newcastle, Grampian and London) (NHS, 2015). By advocating KT and incorporating the tape into treatment approaches, it is being promoted by clinicians as a method to treat MSK injuries, following a stroke and for post-surgical symptoms such as oedema (Morris *et al.*, 2013; Williams *et al.*, 2012). Research has shown that ETT is effective in producing positive outcomes in injury rehabilitation within MSK practice, for example increasing bicep strength (Fratocchi *et al.*, 2013); decreasing lower back pain (Kachanathu *et al.*, 2014) and correcting posture (Van Herzele *et al.*, 2013). Due to trust procedures and protocols, clinicians may not have the choice of different brands of ETT within the hospital setting, removing the option of individual clinical reasoning on the effectivity and evidence base of the modality suggesting why KT was the most popular brand of ETT within this environment. Furthermore, Sutherland (2015) suggests factors such as the clinicians' environment, employers, budget and affiliations with consumable providers may influence the uses of different branding; these factors could explain the sampled clinicians' branding choices. Interviews only highlighted one clinician that was aware of the use of ETT within the hospital setting:

“I know the training courses I attended in Newcastle were recruiting from the local hospital to have Physio’s trained in Kinesio Tape. I think the tape is more widely used in the sporting context but is up and coming within the NHS and private practice”

[Interviewee 7-trained]

5.2 The efficacy of ETT within population groups as a treatment modality

Within the online survey, clinicians were asked to identify the primary, secondary and tertiary populations groups that they worked with to explore how clinicians are using ETT within their clinical practice (Table 4.1, page 48). The most common population identified by clinicians was MSK (primary n = 23, secondary n = 15, tertiary = 3). When focusing specifically on MSK as the primary population, injury rehabilitation was the main aim (n = 15). MSK was also ranked as most popular (n = 15) when clinicians were asked to identify their secondary population group, however the main aim here was more varied, with injury rehabilitation (n = 7) pain reduction (n = 6) and reduction of inflammation (n = 2) being cited. The most popular tertiary population worked with was Neurological (n = 13) and the main aim here was pain reduction (n = 8). These will be discussed in the following subsections.

5.2.1 MSK: Primary and Secondary population

Current literature suggests the main use of ETT is to treat MSK injuries, in terms of injury rehabilitation (correcting soft tissue movement, ligament and tendon support, postural correction), pain reduction (Akbas, Atay & Yuksel, 2011; Chang *et al.*, 2010; Donec *et al.*, 2012; Lumbroso *et al.*, 2013; Morris *et al.*, 2013; Mostafavifar *et al.*, 2012; Parrieira *et al.*, 2014) and increasing muscular activity or peak torque (Briem *et al.*, 2011; Fracocchi *et al.*, 2013; de Hoyo *et al.*, 2013; Lumbroso *et al.*, 2013; Poon *et al.*, 2014). Healthcare professionals such as GSRs, Sports Therapists and Physiotherapists typically work with a high proportion of clients with MSK injuries or pathologies, whether they work privately or within the public sector (BASRaT, 2015; CSP, 2015; SOST, 2015). The results of the current online survey therefore support the literature identifying that ETT is most commonly used within the field of MSK.

However, the current systematic reviews available (Carmo Silva Parreira *et al.*, 2013; Kalron & Bar-Sela, 2013; Morris *et al.*, 2012; Mostafavifar *et al.*, 2014) conclude there is insufficient substantial evidence to support the use of ETT in a MSK setting, although there are reported improvements in strength and ROM to an injured site, highlighting the dilemma clinicians have surrounding EBP versus practice based evidence.

An explanation for the popularity of MSK as a population group may be from the practical application of the tape, making it a simple treatment adjunct for injury rehabilitation (Mostafavifar *et al.*, 2012). However, as previously discussed, upon systematically reviewing ETT within clinical practice, evidence has suggested that its use is not warranted (Carmo Silva Parreira *et al.*, 2013; Kalron & Bar-Sela, 2013; Morris *et al.*, 2012; Mostafavifar *et al.*, 2014), yet evidence does exist to support its use for increasing ROM (Alves de Oliveira *et al.*, 2013; González-Iglesias *et al.*, 2009; Thelen *et al.*, 2008; Van Herzelee *et al.*, 2013), increasing grip strength (Donec *et al.*, 2012) and decreasing pain (González-Iglesias *et al.*, 2009; Llopis & Aranda, 2012; Saavedra-Hernández *et al.*, 2012) within MSK practice. Furthermore, introductory courses and techniques into the use of ETT are easily accessible, yet these cover only common MSK pathologies, as opposed to more complex techniques such as neurological and lymphoedema, which require further, continued professional development (Kinesio UK, 2014). This could suggest why this group was as popular as this introductory course is what clinicians will have trained in.

The clinicians' main aim when using ETT within the MSK population group was injury rehabilitation (n = 15). The area of injury rehabilitation encompasses a variety of pathologies and injuries encountered by clinicians which could account for the large

proportion of respondents selecting this option as a primary aim, with it being a more wide ranging response in comparison to the other more specific options, for example mechanical or function correction. Injury rehabilitation was also the most popular main aim for the secondary population again being MSK. ETT has been widely researched in injury rehabilitation across a range of MSK pathologies however there is conflicting and inconclusive evidence to support its use. For example, Ujino *et al.* (2013) concluded ETT did significantly increase ROM at the shoulder joint compared to stretching alone in participants with no history of shoulder injuries; however Kaya *et al.* (2014) reported no significant improvement between using ETT compared to manual therapy and an exercise group with subjects with shoulder impingement syndrome. These constant conflicting articles surrounding ETT may suggest why the clinicians opted for a generalised aim, as then justification in subsequent questions would be all encompassing.

The proposed mechanisms by the manufacturers for ETT is an increase in blood circulation, a physiological change that may facilitate an increase in ROM within muscle, and/or increase the function of soft tissue and reduce inflammation, all of which are aspects of injury rehabilitation (Kase *et al.*, 1996; Morris *et al.*, 2013; Parreira *et al.*, 2014; Thelen *et al.*, 2008; Yoshinda & Kahanov, 2007). Within the interviews, both trained and untrained clinicians verbalised understanding of these proposed mechanisms, with specific reference to the KT mission statement such as lifting the epidermis and increasing interstitial space, this could suggest how the influence of company's marketing and presence could have on the clinician's perceptions surrounding the modality, for example:

“It lifts the skin and increases the interstitial space to allow normal movements of fluids throughout the body. By decreasing the pressure and...increasing the fluid flow would then allow an improvement in...range and also movement without pain”

[Interviewee 12-trained.]

“From what I understand, ETT is a greatly improved tape to standard taping techniques that has increased the physiological effects. The tape lifts the first layer of skin to allow an increase in blood flow...this can help with removing waste products”

[Interviewee 3-untrained]

5.2.2 Neurological conditions: Tertiary population

Neurological conditions were identified as the third most common population where ETT was used, as it had the highest rank for the tertiary population (primary n = 0, secondary n = 11, tertiary n = 13). There is limited research exploring the use of ETT for neurological conditions, however ETT has been reported to be beneficial with stroke patients (Bell & Muller, 2013; Jaraczewska & Long, 2006; Karadag-Saygi, Cubukcu-Aydoseli, Kablan & Ofluoglu, 2010; Kim, Choi, Lee & Park, 2014; Kim, Seo & Lee, 2002) and Parkinsons Disease (Capecchi *et al.*, 2014). Research conducted by Jaraczewska and Long (2006) recommend that ETT may support joint structure, improve muscle function, reduce pain and increase proprioception; all elements combine to improve functional use of the upper extremities which is fundamental to facilitate or regain after suffering from a stroke. Furthermore these benefits cited by Jaraczewska and Long (2006) mirror those which are described when using ETT for MSK conditions or injuries and may explain why neurological conditions were identified as the tertiary group by the clinicians sampled. Within the online survey, little reference was given specifically to the stroke population, therefore answers were

restricted in explicitly discussing this population group, however some clinicians discussed its use in reducing pain and correcting the neural structures following an injury, with the interviews only highlighting one clinician who had utilised ETT within this field explicitly to facilitate motor control with Parkinson's Disease. With the prevalence of neurological diseases increasing (NHS, 2013) constant advancements in treatment modalities is required. It is therefore contradictory to current trends to not see ETT used as prevalently as an alternative treatment option for this population group. With the lack of respondents eliciting to its use with this group of clients, an explanation or conclusive statement as to why cannot be obtained.

As previously discussed healthcare professionals traditionally work with general outpatients or within the sporting context, resulting in the MSK or Athlete options ranking higher than the more specialised group of neurological, particularly considering physiotherapists specifically have to train in Bobath (specific neurological treatment approach) at post graduate level to specialise in this niche area to ensure they have advanced handling and treatment skills (CSP, 2015; NHS, 2015). Although neurological conditions were the most popular tertiary population, participant responses from the long answer questions gave limited reasoning as to why, indicating the need for further investigation into the reasons for the use of ETT with neurological pathologies and how clinicians' choice of intervention is influenced by external parties and the environment in which they work.

The main aim when using ETT within the neurological environment was for pain reduction (n = 8). Pain reduction was also an important aim when MSK was identified as the secondary population group (main aim injury rehabilitation n = 8, pain reduction

n = 7; Figure 4.4, page 49). It could be suggested that the group name 'MSK', similar to the main aim of 'injury rehabilitation' may be too much of a wide-ranging, all-encompassing label within the current study; clinicians may have struggled to identify three population groups worked with, and as Jaraczewska and Long (2006) identify, the same rehabilitation principles may be being applied across different population groups. ETT has been shown to be effective in pain reduction which can decrease the apprehension of movement thus increasing ROM (Gonzalez-Iglesias *et al.*, 2009; Llopis & Aranda, 2012; Saavedra-Hernández *et al.*, 2012) and this has been demonstrated with different ETT brands, time frames and populations. Furthermore, Castro-Sanchez *et al.* (2012) established ETT was beneficial to participants with non-specific lower back pain in functionally increasing ROM, and also reducing pain, which is also supported by studies who found similar results (Kachanathu *et al.*, 2014; Yoshida & Kahanov, 2006). In contrast, Parreira *et al.* (2014) found when ETT was applied to the lower back, it was no more effective in increasing ROM or decreasing pain than placebo taping. Although evidence is conflicting, respondents still perceive reducing pain as a main aim, however, the lack of evidence may suggest it is of lower priority in comparison to other aims of ETT and could also be linked to the aim of injury rehabilitation.

5.2.3 Athletic population group

The use of ETT within the athletic environment, although commonly reported in the clinicians sampled (primary n = 17, secondary n = 14, tertiary n = 3), it did not rank as a top primary, secondary or tertiary group (Table 4.1, page 48). Research however, supporting ETT is limited within this population group and is often case reports rather than controlled trials. Research with athletes has explored the use of ETT with the range of glenohumeral rotation (McConnell & McIntosh, 2009), medial epicondylar

tendinopathy (Chang *et al.*, 2013), maximal grip strength (Chang *et al.*, 2010) and lower back pain (Kubacki, Nalazek, Trela & Zukow, 2011). With the exception of Chang *et al.* (2013), all aforementioned studies found a positive result with the athletic population group, benefiting the injury in question. Critically, all studies combined ETT with other treatment modalities such as massage and mobilisations, and did not have a control or placebo taping group, decreasing the validity of the ETT having the sole benefit of producing the positive result. The interview process also highlighted this combination of treatment modalities to produce positive results with the tape, making it difficult to determine what influence ETT alone has within the athletic environment.

Furthermore, Vercelli *et al.* (2012) and Simon and Donahue (2013) suggest some athletes utilise ETT as a psychological crutch rather than a therapeutic tool, therefore some clinicians may be using the tape more in this environment due to client demands. Tremblay and Karam (2015) concur stating there is complexity surrounding ETT involving whether there is an element of psychological benefit in terms of having a placebo effect on the athletes. Delahunt *et al.* (2010) state that the use of tape can have subjective influences on the athletes confidence and reassurance during an event with the literature heavily stating taping can have a placebo effect with athletes (Beecher, 1995; Delahunt *et al.*, 2010; Gear *et al.*, 2011; Hulme & Gerrard, 1998; Hunt & Short, 2006; Sawkins *et al.*, 2007).

Although the influence of a psychological or placebo effect did not arise as a theme throughout the interview process, two clinicians did express their opinion on the use of ETT as a psychological crutch, both of whom work within the sporting arena where ETT was heavily used within their clinical practice.

“I also think psychologically the tape has a massive part to play...for instance with athletes [pauses] feel there is a subjective improvement so their perception of once the tape is applied, seems to have a positive effect on their performance knowing that this tape is on seems to enhance performance. Also patients who have working ergonomic issues, when the tape is on they can perform better at work, so there seems to be a pattern with these types of client groups”. [Interviewee 8- Trained]

“I think there is a lot of people, particularly the more experienced practitioners who believe it is has more of a psychological effect, so perhaps more evidence is needed to demonstrate to those who think this way.” [Interviewee 11- Trained]

Furthermore, the demand for performance enhancement and athletic endurance within the sporting arena, may be of benefit to lesser established, innovative modalities such as ETT, as individuals and teams seek any advantage over their opposition (Vercelli *et al.*, 2012), however these aims were not identified as important to the sampled clinicians' groups (Figure 4.4, page 49). The lack of responses within these fields could be due to the contradictory research into performance enhancement and athletic endurance, with some authors concluding ETT has no significant influence on enhancing muscle performance during isokinetic testing (de Hoyos *et al.*, 2013; Lins *et al.*, 2012; Poon *et al.*, 2014; Wong *et al.*, 2012), in contrast to Lumbroso *et al.* (2013) and Vithoulka *et al.*

(2010) who state ETT can enhance performance, if not immediately, then effects can be seen two days post testing. Within the interviews, clinicians also failed to view any of these aims as significant when working with clients, although, one interviewee briefly mentioned performance, however this was linked to how they perceived the psychological effects the tape may have on performance. ETT is a popular and fashionable modality within the athletic environment (Kalron & Bar-Sela, 2013) and may highlight the influence that the media and professionals can have on products and consumers perceptions (Montalvo *et al.*, 2014; Mostafavifar *et al.*, 2012; Williams *et al.*, 2012). This also poses the question as to whether this has an influence on the image and reputation of the clinician, to be seen working with ETT and having the same skill set as those working within elite sport such as Team GB.

5.2.4 Lower ranking population groups

The lymphatic population group was selected as a primary (n = 3), secondary (n = 2) and then increased for tertiary population (n = 8). Lymphoedema is a common complication following breast cancer treatment (Chou, Li, Lio & Tang, 2013) and applying ETT has been suggested to enhance the lymphatic flow and decrease the oedema surrounding the auxiliary area, a common effect following breast cancer treatment (Finnerty, Thomason & Woods, 2010; Lipińska *et al.*, 2007). Increased ROM following lymphatic surgery or mastectomy is also stated (Chou *et al.*, 2013; Finnerty *et al.*, 2010; Lipińska *et al.*, 2007) however these findings have been reported in case studies and conclusions made are limited by small sample sizes and lack of scientific rigour. Despite this limited literature supporting the use of ETT for lymphoedema, it is commonly used within the National Health Service, post-surgery, yet it is not available in all trusts (Finnerty *et al.*, 2010). Lymphoedema patients are seen within a hospital

setting, linking to the affiliation and the advocating of using the brand KT within this environment as stated in 5.1.2; possibly alluding to why this was the most population brand in this environment (Figure 4.3, page 48). This further supports the statements by Sutherland (2005) regarding the demographic factors which may influence the use of certain branding of a product, rather than the evidence base surrounding the product.

Another rationale for the lymphatic conditions not ranking as a primary, secondary or tertiary group could be due to the specific lymphatic techniques utilised within ETT, are not introduced at the fundamental levels of ETT training; therefore not all clinicians trained in the use of ETT are aware or trained to administer this technique (Finnerty *et al.*, 2010), possibly highlighting why this population group did not rank highly (Table 4.1, page 48). During the follow up interviews, not one clinician was trained at the higher level of KT (Level 3 Lymphoedema), however responses surrounding ETTs effectiveness in facilitating the lymphatic system and decreasing oedema from both trained and untrained clinicians were present further highlighting the influence of each brandings' mission statements, for example:

“I think the tape I extremely effective in decreasing pain through correction and decreasing pressure within the epidermis. The tape mimics the skins elasticity and lifts the erm...epidermis allowing increased blood flow and lymphatic flow and decreasing pressure which then decreases pain and swelling” [Interviewee 7- trained].

“As it creates erm...space between the muscle and surrounding features to allow an increase in blood flow and erm...lymph flow. It takes like....some of the weight of the muscle. [Interviewee 6- untrained].

Scarce evidence exists for ETT use within the elderly and paediatrics population groups and subsequently, both of these groups were ranked low on the populations that clinicians see primarily in their clinical practice. The elderly was utilised as a primary (n = 1), secondary (n = 3) and then increased for tertiary population (n = 7). Paediatrics produced similar results, for the primary (n = 2), secondary (n = 1) and increased for tertiary population (n = 9). Yasukawa *et al.* (2006) investigated the effects of KT on children with reduced motor skills following an acquired disability and reported that KT improved upper extremity control and function in the paediatric setting, suggesting it should be used as an adjunct to the intensive rehabilitation protocol following traumatic brain injury. Subsequent research has not followed up this study or the reported findings, to conclude whether tape can have lasting effects on children's motor control or on their functional performance. This lack of evidence may be a reason for the limited use of ETT within the elderly and paediatrics populations in the online survey.

5.3 Perception of evidence base and clinical decision making

When clinicians were specifically asked to consider their views on the evidence base surrounding the use of ETT in the online survey and interviews, there was a clear consensus that clinicians were using their clinical decision making, specifically choosing practice based evidence over EBP when utilising ETT. Clinical decision making, incorporating previous experiences, perceptions and beliefs is being relied upon more heavily when utilising a modality, such as ETT with clients (Artino *et al.*, 2014; Charlin *et al.*, 2012; Custers 2013).

The current ETT literature is somewhat conflicting with few randomised controlled trials (Campolo *et al.*, 2013; Castro- Sánchez *et al.*, 2012; González-Iglesias *et al.*,

2009; Saavedra-Hernández *et al.*, 2012), limited in depth valid studies and limited transferability of evidence into clinical practice (Artino *et al.*, 2014; Charlin *et al.*, 2012; Cimino, 2013; Custers 2013; Forsberg *et al.*, 2013; Higgs, 2008; Nendaza & Perriera, 2012; Sniderman, *et al.*, 2013). A number of respondents from the survey had been KT trained as were all of the trained interviewees, which could explain why their responses are similar to those outlined by the KT brand. Those who have trained with KT are perhaps biased towards the brand rather than ETT as a whole field, by being influenced by the material acquired on the relevant courses. Due to inconclusive findings on how clinicians believe ETT can work for their main aim and goal, this could also link to the heavily criticised lack of sufficient evidence to support the use of ETT within clinical practice.

All respondents within the online survey and interviewees did however cite their disappointment and scepticism with the currently available evidence base, such as:

“Currently, I think the evidence base is sparse to be honest...and limited. With that being said, it does not stop me using ETT and I think with anything in MSK you have to make a clinical judgement and clinically reason its use to your client and although the evidence is not 100% conclusive, I think it should be used in clinical practice as I have seen its effectiveness with numerous clients” [Interviewee 7- trained].

“I think the evidence is not strong enough for them to use it I don’t think...they are going on experiences rather than the scientific evidence” [Interviewee 6- untrained].

“I believe the evidence base exists but there is still a lot of contradictory findings that cause confusion.” [Respondent 33]

“As with many modalities within our field, the evidence base is quite poor, being mainly hypothetical [Respondent No 14]

These statements support Carmo Silva Parreira *et al.* (2013), Morris *et al.* (2013), Mostafavifar *et al.* (2012) and Williams *et al.* (2012) who all state that the evidence surrounding the topic is extremely sparse, lacks quality and needs serious attention to provide evidence based theory to the use of ETT. When clinicians were invited to discuss their beliefs on the processes that occur due to the use of ETT and how these relate to achieving the stated aims or goals of working with a specific population, there was no clear agreement of why ETT is utilised lending further support to Carmo Silva Parreira *et al.* (2013), Morris *et al.* (2013) Mostafavifar *et al.* (2012) and Williams *et al.* (2012).

Despite this clinicians continue to use the modality within their clinical practice and the continued use of ETT without a sufficient evidence base could be influenced by patients’ perceptions and their requests for its use, which is supported by the hypothesis of Mostafavifar *et al.* (2012). The authors concluded, although there is insufficient evidence for or against ETT after an injury, the patient may still benefit from a placebo effect from the modality. Patient opinions may also be influenced similarly to clinicians through the media and through sporting endorsement outlined in Chapter 1.3. Online

survey and interviews also supported this between trained and non-trained clinicians, for example:

“As I know it’s successful I have no problem in recommending to clients”.

[Respondent No 32]

“I think they see it on TV and think because they see someone famous using it that they need to be using it rather than the science behind why it’s used”

[Interviewee 2-untrained].

“I think the media has played a big part in this where athletes see other high level athletes wearing the tape. Also they have seen the tape on TV and not necessarily with the underpinning knowledge as to why the tape is being applied” [Interviewee 8-trained].

The views on the evidence can also be linked to the perceptions clinicians have surrounding the use of ETT following peer discussions. As previously discussed in Chapter 2.3, beliefs and perceptions can originate from past experiences with clients or from peer discussion and in service development (Bond & Soundy, 2012; Ernstzen *et al.*, 2009; Scheufele, 1999; Wählberg & Sjöberg, 2000) often without the grounding of fully understanding the physiological aspects to the modality. This could highlight why ETT’s use is continuing regardless of the lacking evidence base as a comprehensive level of EBP may not fully influence or alter a clinician’s use. In service development can also enforce clinicians to share their positive or negative experiences with ETT and influence another clinicians continued professional development (Ernstzen *et al.*, 2009). Furthermore, as competition for employment within clinical and sporting environments

rises, it is likely that despite the lack of sufficient evidence base exists surrounding ETT, clinicians are still going to become trained in the field to become part of a competitive job market (Scheufele, 1999; Wählberg & Sjöberg, 2000).

Overall, research has shown the significant importance of using clinical decision making and incorporating evidence based practice into clinical practice (Artino *et al.*, 2014; Charlin *et al.*, 2012; Cimino, 2013; Custers, 2013; Forsberg *et al.*, 2013; Higgs, 2008; Nendaza & Perriera, 2012; Sniderman *et al.*, 2013). However, results from Chapter Four show clinicians are disregarding the lack of sufficient evidence base surrounding ETT and basing their clinical choices on their perceptions, previous clinical experiences and patient requests.

5.4 Limitations

5.4.1 Response and completion rates

A number of professional bodies were approached however only one hundred and twenty two participants responded to the online survey (Table 3.1, page 40). Literature suggests low response rates are often seen with allied health professionals when conducting postal and online surveys (Cook, Dickinson & Eccles, 2009; Edwards *et al.*, 2002; VanGeest, Johnson & Welch, 2007). Braithwaite, Emery, De Lusignan and Sutton (2003) cited a wider set of explanatory variables such as increasing workloads within the healthcare sectors, professions, anonymity and survey length as reasons for decreased response rates. Brüggena and Dholakiab (2010) and Wright (2006) suggest low responses could be due to ETT use being a niche subject area that not all clinicians

are trained in, meaning the target audience is significantly reduced compared to a survey for example questioning musculoskeletal training at undergraduate level.

Although responses from the online survey were anonymous, some respondents may have felt uncomfortable providing truthful or critical answers as some clinicians still support their chosen brand of ETT, although they believe valid evidence is lacking, meaning answers could lack the critical detail which was sought after in this study. Similarly responses within the interviews again may have lacked significant critical opinions due to the face to face nature of the interview. Bowling (2005) suggests postal surveys enhance anonymity and are also linked to higher response rates which could be employed in future studies.

Additionally, there may have been design and terminology issues within the online survey, for example the classification of MSK may have been too all encompassing and wide ranging between population groups and injury rehabilitation may have been too broad to identify subtle distinctions between the main aims or goals. The questionnaire was piloted to six clinicians however; these classifications and terminology were not highlighted or identified as a problem in the piloting phase.

The completion rate for the online survey was 38% (n = 46). Research has suggested that lower completion rates can be constructive, as the depth and quality of answers in the sample will have a greater chance of being more informative as the respondent may feel more inclined to provide more detailed answers (Marshall, 1996; Maxwell, 2005; Patton, 2005). Furthermore, valid inferences can be made from smaller sample sizes (Marshall, 1996; Maxwell, 2005; Patton, 2005), leading to a more logical conclusion being drawn. Marshall (1996) also suggested for quantitative studies, there is no

specific number of respondents required to enable valid inferences and stated “there is little to be gained from studying very large samples” (p 522), however it was also alluded that a suitable amount of respondents must be gained to ensure the research question is adequately answered. Marshall (1996) failed to state a threshold sample size that must be passed for online surveys and one could question, for online surveys, whether there is such a thing as a suitable sample size (Jones, Carley & Harrison, 2003). These statements in respects to sample size by Marshall (1996) are not based on any controlled trial and are purely opinions based on experience within the field, possibly giving prominence to a bias comment; therefore no direct comparison can be made with Chapter Four.

62.3% of the online surveys were excluded for the non-completion of all mandatory questions which was necessary to meet the strict inclusion criteria of gaining full informed consent. Often it was the longer, more detailed questions that were not completed and previous literature has established responses to surveys are higher when shorter or multiple choice questions are used throughout a survey rather than including long answer questions (Edwards *et al.*, 2009). When the long answer questions were answered there appeared to be differences in the interpretation of the questions possibly due to a lack of understanding or knowledge on the subject area, and differences in the depth of answers given, possibly due to the questions being a burden to complete, thus resulting in them being omitted entirely (Bowling, 2005). In future surveys the long answer questions could be eliminated and left for the face to face follow up interviews, with the addition of shorter, more focused questions in the online or postal survey and in addition, less strict inclusion criteria should be considered for informed consent.

Relying on the professional bodies to resend the link involved a trust element from the investigator, research suggests a positive and frequent interaction between these two parties, which can increase responses (Moorman, Zaltman, & Deshpande, 1992), however to what extent this was influential cannot be concluded. The level to which external parties are involved in the research process can also hinder the overall results, as trust has to be established and matured over time (Moorman *et al.*, 1992); which due to time constraints between gaining ethical approval and the release of the online survey could not be established, with the exception of the investigators own professional body.

5.4.2 Interviews

Twelve clinicians were purposely sampled for interview following the online survey, due to respondents of the online survey withdrawing consent for follow up interviews. Research suggests that interviews are the most commonly used method to collect qualitative data and allows in depth accounts of knowledge and views and opinions of the subject in hand, which can enrich any previously collected quantitative data (Gill, Stewart, Treasure & Chadwick, 2008; Lambert & Loiselle, 2007). The interview questions were semi structured and formulated based on the online survey questions, specifically surrounding the use of ETT within their clinical practice (if trained), the evidence base around ETT, and clinicians understanding into the effectiveness of the tape. The questions were centered on these themes, to gain more detailed answers than what had been collected during the online survey. By having semi-structured questions, this allowed the interviewee to speak freely without interruption, be more conversational and relaxed, and to guarantee interviewees were asked questions which were not biased in any way to a desired answer (Gill *et al.*, 2008; Morse, 2000; Sandelowski & Barroso, 2002).

Lambert and Loiselle (2007) state the interviewer and interviewees' demographics should be matched to ensure responses are not influenced in any way, and that interviewers adopt a neutral role so as not to manipulate or lead responses to the questions asked. Unfortunately the demographics of the interviewer differed from those of the interviewee, with specific reference to age, gender, profession and level of clinical experience, which may have influenced the results by prompting the interviewer to exhibit various cues, resulting in biased responses in a favourable light (Sears & Rowe, 2003). As an alternative, focus groups could have been conducted, this would have reduced any biasing or influential opinions and enabled the interviewees to interact more as clinicians in healthy discussion of their experience of ETT (Lambert & Loiselle, 2007; Stewart & Shamdasani, 2014; VanGeest *et al.*, 2007). Ensuring any group dynamic issues, for example dominant characters suppressing the voices and views of less dominant members of the groups, should be controlled (Stewart & Shamdasani, 2014).

Additionally, there was the potential for researcher bias within this study and although this was acknowledged in Chapter 3, in future studies this could be eliminated by incorporating other researchers to devise questions, transcribe data and conduct interviews. Moreover, there is the bias of the KT brand within the clinical environment, it may have also been beneficial to get a varied ETT training perspective, as all trained interviewees in the interviews and the majority in the online survey were KT trained and as such may have provided a biased view on their use of ETT in line with the KT brand. Finally, as ETT is a specialised field of expertise, although it was beneficial to identify and question trained clinicians to gain detailed answers in their online survey responses,

valuable data could have been omitted from non-trained clinicians' giving a limited scope of decisions.

Chapter 6 Conclusion

6.1 Conclusions

This thesis examined how ETT is currently utilised within clinical practice, the populations it is commonly used with and how clinicians view the current effectiveness and evidence base surrounding the tape. By undertaking an online survey and follow up interviews, it can be concluded that despite the lack of conclusive evidence, ETT is utilised within clinical practice, although often in conjunction with other modalities and hands on techniques. Furthermore, it can be concluded that clinicians are often using practice based evidence rather than evidence based practice when it comes to defending their application of ETT. A comprehensive evidence base however, may not always correlate with greater informed clinical decision making regarding ETT. The thesis challenges previous literature by revealing clinicians still utilise ETT in their clinical environment and this continues despite the conflicting and somewhat confusing evidence available. Therefore, this thesis can be useful to clinicians who use ETT in their clinical practice to solidify and reiterate their choices in clinical decision making rationalising the use of ETT as a treatment modality, with Chapter Four providing quantitative and qualitative data offering an insight into clinicians' current use of ETT in their clinical practice and their view of the evidence base. It is beyond the realm of this thesis however, to guide clinicians in how to use ETT within clinical practice, but calls for a need for future controlled clinical trials to be conducted into the use of ETT to further the evidence base of this ever-growing modality.

6.1 Future research

The results of this thesis highlight the need for further research to be conducted in order to measure the efficacy of ETT in the treatment of MSK injuries and pathologies, ensuring appropriate blinding of participants and investigators and the use of a control group to ensure methodological quality is maintained, as previous research has somewhat lacked these qualities. This would in turn benefit the clinical field, as clinicians would then be using a more evidence based practiced approach in comparison to the current practice based evidence approach. Future research needs to be conducted into the physiological aspects of the tape and distinguishing the difference if any between brandings, to then support or oppose Kase's hypothesis, thus facilitating clinicians understanding into the effectiveness of ETT. This could noticeably add significance to the level of evidence that is available at this present time. Furthermore, as highlighted in Chapter 2, further research investigating the use of ETT within the neurological and lymphatic population groups as currently this is the weakest area of research. Building upon this thesis, further research investigating clinicians' views on ETT could enhance the data set, ensuring surveys are devised by another research to reduce researcher bias, but also to open the survey out to non-trained clinicians' to gain their perceptions and beliefs on how the tape works within clinical practice.

Chapter 7 References

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Appendix A

Professional bodies approached

British Association of Sport Rehabilitators and Trainers
Chartered Society of Physiotherapists
Kinesio UK
Kinesio Taping International
Sports Therapy Association
Society of Sports Therapists
General Chiropractic Council
British Chiropractic Association
Association of Chartered Physiotherapists In Neurology
Association for Chartered Physiotherapists in Respiratory Care
Health and Care Professions Council
Association of Chartered Physiotherapists in Sports Medicine
Association of Chartered Physiotherapists in Occupational Health and Ergonomics
British Association of Prosthetists and Orthotists

Appendix B

Ethical application

Department of Sport, Health & Exercise Science- EC1A



RISK CHECKLIST AND STAGE 1 - RESEARCH ETHICS APPROVAL FORM

All research carried out by students and staff in the Department of Sport, Health & Exercise Science must receive ethical approval before the project or study begins.

Forms

- All applicants **MUST** complete this Risk Checklist and Stage 1 - Research Ethics Approval Form.
- Applicants whose research studies are classified as Risk Category 2 or 3 must also complete the separate Stage 2 - Research Ethics Approval Form.

Notes for completion

- University Research Ethics Policy and Research Ethics Procedures*
The University Research Ethics Policy and Research Ethics Procedures should be read prior to the completion of this application. Consideration of the application will be undertaken in accordance with the University's Research Ethics Policy and Procedures.
- Professional, Statutory or Regulatory Bodies*
Applicants should consider any additional requirements by any relevant Professional, Statutory or Regulatory body; and any other bodies (for example, learned societies) which may be relevant to the subject area in question. Where the project comes under the jurisdiction of the National Research Ethics Service, a copy of the approval from an NHS Research Ethics Committee should be included in the submission.

Submission

Students: please email the typed form/s to your Research Supervisor / Director of Studies.

Staff: please email the completed form/s to Alicia Milson, Departmental Administrator who will log your application and then forward to an appropriate Local Research Ethics Co-ordinator (LREC) for consideration. Please make sure the DISCIPLINE box is completed which will ensure that the appropriate LREC receives the application.

How to complete the form

You can navigate through the form by using the tab keys.

Signatures

Electronic/typed signatures are acceptable for emailed forms.

Outcome

Applicants will be advised of the outcome of the application by:

- The Research Supervisor or Director of Studies for Risk Category 1 student projects;
- The Local Research Ethics Co-ordinator or the Faculty Research Ethics Committee for Risk Category 2 and 3 projects.

You may only begin your research when you receive notification that the project has ethical approval.

If the circumstances of your research study change after approval it is your responsibility to revisit the Risk Checklist and complete a further application.

Advice

Complete the Risk Checklist and Stage 1 - Research Ethics Approval Form first. If you are uncertain about the answer to any question:

- Seek guidance from your Research Supervisor or Director of Studies (students only);
- Contact your Local Research Ethics Co-ordinator (staff only).

CONFIRMATION STATEMENTS	
The results of research should benefit society directly or by generally improving knowledge and understanding. Please tick this box to confirm that your research study has a potential benefit. If you cannot identify a benefit you must discuss your project with your Research Supervisor to help identify one or adapt your proposal so the study will have an identifiable benefit.	
Please tick this box to confirm you have read the Research Ethics Procedures and will adhere to these in the conduct of this project.	

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-

RISK CHECKLIST - Please answer ALL the questions in each of the sections below

WILL YOUR RESEARCH STUDY.....?

	<u>RISK CATEGORY 1</u>	<u>YES</u>	<u>NO</u>
1	Involve direct and/or indirect contact with human participants?		
2	Involve analysis of pre-existing data which contains sensitive or personal information?		
3	Require permission or consent to conduct?		
4	Require permission or consent to publish?		
5	Have a risk of compromising confidentiality?		
6	Have a risk of compromising anonymity?		

7	Contain sensitive data?		
8	Involve risks to any party, including the researcher?		
9	Contain elements which you OR your supervisor are NOT trained to conduct?		
10	Use any information OTHER than that which is freely available in the public domain?		
<u>RISK CATEGORY 2</u>			
11	Require permission or informed consent OTHER than that which is straightforward to obtain in order to conduct the research?		
12	Require permission or informed consent OTHER than that which is straightforward to obtain in order to publish the research?		
13	Require information to be collected and/or provided OTHER than that which is straightforward to obtain?		
<u>RISK CATEGORY 3</u>			
14	Involve participants who are particularly vulnerable or at risk? (e.g. young people, prisoners, sports disability groups)		
15	Involve participants who are unable to give informed consent?		
16	Involve data collection taking place BEFORE informed consent is given?		
17	Involve any deliberate deception or covert data collection?		
18	Involve a risk to the researcher or participants beyond that experienced in everyday life?		
19	Cause (or could cause) physical or psychological harm or negative consequences?		
20	Use intrusive or invasive procedures?		
21	Involve a clinical trial?		
22	Include a financial incentive to participate in the research?		
23	Involve the possibility of incidental findings related to health status?		
24	Involve your own students or staff (this question is for STAFF MEMBERS ONLY)		

CLASSIFICATION - Please answer the following questions in order to classify the risk level of your study

C1 – Did you answer ‘YES’ to any of the questions (1 to 24) in the Risk Checklist above?

Yes		Please go to question C2
No		If you answered NO to all the above questions, your study is classified as Risk Category 1 (literature reviews will be Risk Category 1)

C2 – Did you answer ‘YES’ to any of the questions in Rick Category 3 (14 to 24) of the Checklist above?

Yes		If you answered YES to any question in Risk Category 3, your study is classified as Risk Category 3 (unlikely to be appropriate for undergraduate students – with the exception of working with young people)
No		If you answered NO to all the questions in Risk Category 3 (but you answered yes to questions in Risk Categories 1 and/or 2), your study is classified as Risk Category 2

APPROVAL PROCESS

Category	Student applicants	Staff applicants
Risk Category 1	<p>If your study has been classified as Risk Category 1, your Supervisor or Director of Studies can give approval for the project.</p> <p>You must complete the remainder of this form and submit it to your Research Supervisor for consideration.</p> <p>A copy of the signed form must be given to Alicia Milson, Departmental Administrator.</p>	<p>If your study has been classified as Risk Category 1, you do not need ethical approval for the project.</p> <p>You must complete the remainder of this form so that your research project is registered with the University.</p> <p>Please submit this form to Alicia Milson.</p>

<p>Risk Category 2</p>	<p>If your study has been classified as Risk Category 2, your Supervisor or Director of Studies can recommend approval for your study by the Local Research Ethics Coordinator.</p> <p>You must complete the remainder of this application form and also the separate <u>Stage 2 - Research Ethics Approval form</u>.</p> <p>Once you have completed the forms please submit both forms to your Supervisor for consideration. Your Supervisor may disagree with your assessment and ask you to make revisions or reject your application.</p> <p>The Local Research Ethics Coordinator will review your project and then decide to approve it, ask for revisions, reject it or pass it on for review via the Chair to the Faculty Research Ethics Committee.</p>	<p>If your study has been classified as Risk Category 2, your project will be considered for ethical approval by the Local Research Ethics Coordinator.</p> <p>You must complete the remainder of this application form and also the separate <u>Stage 2 - Research Ethics Approval form</u>. Please submit both forms to your Local Research Ethics Coordinator for consideration.</p> <p>The Local Research Ethics Coordinator will review your project and then decide to approve it, ask for revisions or pass it on for review via the Chair to the Faculty Research Ethics Committee.</p>
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Risk Category 3	<p><u>Postgraduate Research Students</u> If your study has been classified as Risk Category 3, you should consult with your Director of Studies as you will normally need to submit to the appropriate Faculty Research Ethics Committee for approval.</p> <p>You must complete the remainder of this application form and also the separate <u>Stage 2 - Research Ethics Approval form</u> and submit both forms to your Director of Studies.</p> <p><u>Undergraduate and Taught Postgraduate Students</u> If your study has been classified as Risk Category 3, you should consult with your Supervisor without delay as it is highly unlikely you will be able to proceed with your study and you should negotiate a project that is of lower risk. The exception may be working with young people.</p>	<p>If your study has been classified as Risk Category 3, your project will be considered for ethical approval by an appropriate Local Research Ethics Coordinator.</p> <p>You must complete the remainder of this application form and also the separate <u>Stage 2 - Research Ethics Approval form</u> and submit both forms to your Local Research Ethics Coordinator.</p> <p>In some instances, Risk Category 3 projects will need to be considered by the appropriate Faculty Research Ethics Committee.</p>
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APPLICATION DETAILS

APPLICANT DETAILS:	
DISCIPLINE	REHAB (PLEASE INSERT DISCIPLINE AREA I.E. COACHING, REHAB, PHYS, PSYCH,BIOMECH)
Your name (if a group project, include all names here)	SARAH HENDERSON
Department	Sport, Health & Exercise Science
Faculty	Science
Status	
<input type="checkbox"/> Undergraduate student	
<input type="checkbox"/> Taught Postgraduate student	

<input type="checkbox"/> Research Postgraduate student	
<input type="checkbox"/> Staff member	
<input type="checkbox"/> Other (give details)	
If student project	
<input type="checkbox"/> Student ID	200880819
<input type="checkbox"/> Course title with award	PhD
<input type="checkbox"/> Student email	s.henderson@hull.ac.uk
<input type="checkbox"/> Research Supervisor's name Or Director of Studies' name	Samantha Nabb and Hollie White
THE PROJECT/STUDY:	
Project /study title	The Use of elastic therapeutic tape in Clinical Practise
Start date of project	11/08/2014
Expected completion date of project	11/08/2015
Is the project externally funded	NO
Project Summary - Please give a brief summary of your study (maximum 100 words):	
<p>The central aim of this study is to determine and investigate the use and beliefs of practitioners trained in elastic therapeutic tape (ETT) and why they use it in Clinical Practise. Participants chosen will have been trained in ETT and therefore their clinical opinion, reasoning and beliefs are of interest especially relating to the appropriate and effective usage of tape with clients or patients.</p>	
NEXT STEP:	

IF YOUR PROJECT HAS BEEN CLASSIFIED AS **RISK CATEGORY 1**, PLEASE COMPLETE THE DECLARATION BELOW AND:

- Students: please submit this form to your Research Supervisor or Director of Studies in the first instance for signature. A copy must then be submitted to Alicia Milson for information.
- Staff: please submit this form to Alicia Milson.

IF YOUR PROJECT HAS BEEN CLASSIFIED AS **RISK CATEGORY 2 OR 3** PLEASE DO NOT COMPLETE THE DECLARATION BELOW. Instead you MUST now also complete the Stage 2 - Research Ethics Approval form and submit both forms together with any supporting documentation.

RISK CATEGORY 1: DECLARATION AND SIGNATURE/S

I confirm that I will undertake this project as detailed above. I understand that I must abide by the terms of this approval and that I may not make any substantial amendments to the project without further approval.

<i>Signed</i>	S Henderson	<i>Date</i>	29/07/2014
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FOR STUDENT PROJECTS:

Agreement from the Research Supervisor or Director of Studies for student projects:

I have discussed the ethical issues arising from the project with the student. I approve this project.

<i>Name</i>	Samantha Nabb	<i>Signed</i>	Samantha Nabb	<i>Date</i>	29/07/2014
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<i>Local Research Ethics Co-ordinator (LREC) name</i>		<i>Date form sent to LREC</i>	
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PLEASE MAKE SURE THAT BOTH STUDENT AND SUPERVISOR SIGN THE APPLICATION AND THEN FORWARD ALL SUPPORTING DOCUMENTATION TO ALICIA MILSON, DEPARTMENTAL ADMINISTRATOR FOR PROCESSING.

Email: A.K.Milson@hull.ac.uk

Alicia Milson

Sport, Health & Exercise Science

Departmental Office

Don Building

University of Hull

This form will be retained for the purposes of quality assurance of compliance and audit for FIVE years

Department of Sport, Health & Exercise Science- EC1B



STAGE 2 - RESEARCH ETHICS APPROVAL FORM

All research carried out by students and staff in the Department of Sport, Health & Exercise Science must receive ethical approval before the research or data collection commences.

Forms

- All applicants **MUST** complete the Risk Checklist and Stage 1 - Research Ethics Approval Form prior to completing this Stage 2 - Research Ethics Approval Form.
- Following completion of the Risk Checklist and Stage 1 - Research Ethics Approval Form, if your research study was classified as Risk Category 2 or 3, you need to complete this form.

Please ensure you include specific details in the appropriate section below especially where a question in the Risk Checklist was answered YES. If a section is not relevant to your project, put 'Not Applicable' or 'N/A'. Please make sure the DISCIPLINE box is completed which will ensure that the appropriate LREC receives the application.

TO BE COMPLETED FOR PROJECTS IN RISK CATEGORY 2 AND 3

DISCIPLINE	(PLEASE INSERT DISCIPLINE AREA I.E. COACHING, REHAB, PHYS, PSYCH,BIOMECH) Rehab
Your name	Sarah Henderson

THE PROJECT	
1	Project title
The use of Elastic Therapeutic Tape in Clinical Practice	
2	Purpose and Aims
What are the purpose and aims of this research?	

The central aim of this study is to determine and investigate the use and beliefs of practitioners trained in elastic therapeutic tape (ETT) and why they use it in Clinical Practice. Participants invited to take part will be trained in the use of ETT and therefore their clinical opinion, reasoning and beliefs are of interest especially relating to the appropriate and effective usage of tape with clients or patients. Following this, investigations between the different types of tape (for example Kinesio Tape, Rocktape, Spider-tech, K-Active) will be analysed. Recent studies have researched the effects of taping on strength, movement analysis and specific joint/muscle injuries such as French (2014) and Williams, Whatman, Hume and Sheerin (2012), but thus far little has been done to research the beliefs of trained clinicians on their use of ETT. Therefore, this research would add to the current literature to highlight ETT's use in clinical practice but also therapists reasoning for using ETT the way they do.

3	Project Description
Describe the project, identifying clearly any human participants and/or secondary datasets involved (this should be a summary description. Details of methodology are required later). What is the intended project duration?	
The project will involve an online survey which will be active from 5 th September 2014 until 5 th November 2014 however the interviews will continue until 20 th December 2014. The project will investigate the reasoning, beliefs and usage of ETT in Clinical Practice. It will involve participants who are active clinicians (Sport Rehabilitators, Physiotherapists, Sports Therapists, Chiropractors) who are trained in ETT. Questions will focus on aims and beliefs of the tape, its use in clinical practice and the participants evidence based reasoning to its use.	

4	Risk: participants
Provide a statement of risk consideration and evaluation in respect of the participants including how any elements of risk will be addressed.	
The overall risk to participants is low. A full list can be found in EC3. The survey will also contain no sensitive questions so no psychological or embarrassment should occur from the participants	

5	Risk: researchers / other parties
Provide a statement of risk consideration and evaluation in respect of the researchers and any other parties (eg, the University), including how any elements of risk will be addressed.	
The overall risk to researchers/other parties is low. A full list can be found in EC3.	

6	Health and Safety
6a	In addition to any factors considered under ‘risk’ above, are there any other health and safety issues either for participants or researchers? (eg, in relation to premises, equipment, etc)
No	
6b	Has advice been taken on how these might be addressed, from whom, and when?
n/a	

METHODOLOGY	
7	Human Participants
7a	Describe the size and nature of group and the rationale for selection. Describe how potential participants will be identified, approached and recruited. Please include inclusion/exclusion criteria.
<p>Prospective participants will be asked to participate in the online survey via a recruitment email. Professional bodies (British Association of Sport Rehabilitators and Trainers BASRaT, Chartered Society of Phyiotherapy CSP, Sports Therapy SOST, General Chiropractors Council GCC) will be contacted to determine whether they would be happy to support the research and promote the research with the view of the student researcher to use their mailing list. In addition Kinesio Tape Association (KTAI) will also be asked as to whether they would participate in the promotion of the research.</p> <p>Participants will be approached via email which will contain a link to the online survey. The text from the participant information sheet will be used as the opening web page of the survey so that participants by taking part in the survey confirm that they have read, understood and consent to taking part. There will be a question at the end of the survey to ask whether participant would be interested in a taking part in follow up interview and participants will be asked to leave an email address if so. I would hope to gain a sample size of over 250 participants following the recruitment process. Inclusion criteria would be as follows: participants must have recognised qualification/training in the use of ETT and be an active member of a professional body. The participants will be excluded if they do not have recognised qualification/training in ETT and are not an active member of a professional body.</p>	
7b	What information is being given to participants? The proposed Information Sheet must be included.

	Participants will be provided with all relevant information through survey monkey. The text from the participant information sheet will be used as the opening web page of the survey so that participants are able to confirm that they have read, understood and consented to proceed.
7c	How is consent being obtained? The proposed consent form must be included.
	Full online consent will be obtained. Participants who complete the online survey have given their consent to take part. Only complete online surveys will be used within the study, as incomplete surveys may indicate withdrawal of consent.
7d	What steps are being taken to ensure that participation is voluntary?
	Participants will be invited to participate through a generic email. This email will be the same for all potential participants. Participants will be made aware in the information sheet that they do not have to consent to taking part and can withdraw from the study at any time without explanation. Participants who disregard the recruitment email will be choosing not to take part, ensuring the voluntary nature of the study.
7e	What provisions for participants' withdrawal from the project are in place?
	If the online survey is not completed due to a participant withdrawing during the online survey completion, the online survey will be destroyed. Once the survey is completed, unless participants leave an email for future contact, due to the anonymous nature of the study it will not be possible to remove data. During the interview, participants may choose to withdraw at any point by indicating so to the student researcher. After the interview has taken place, those who want to withdraw from the study are able to do so by sending an e-mail to the student researcher.
7f	Is it intended to pay participants? If yes, include the rationale for this, with payment rates and source of funding.
	No
7g	Children and Adults at risk: How is informed consent being obtained? The proposed Consent (and Assent Form where appropriate) must be included. If it is anticipated that consent is not in written form, full justification for this approach must be included.
	n/a

8	Confidentiality and Anonymity
8a	How will anonymity of participants be secured?

<p>Each entry to survey monkey will be given an unique identifier. Participants only need to give names and contact details if they wish to take part in follow up interviews. Data analysis and write up will be coded securing anonymity of participants. Follow up interview recording will also be coded and saved on the student investigators password protected computer. Participant's names or other personal details will not be associated with their data.</p>	
8b	<p>How will confidentiality of personal information and/or information provided by participants be secured?</p>
<p>Once online surveys have been processed electronic data will be stored on the student investigators password protected computer. As outlined in 8a all data will be coded.</p>	
8c	<p>Are there circumstances in which the requirements of professional practice might impact on confidentiality and anonymity provisions?</p>
<p>No</p>	
8d	<p>Are there any issues relating to information provided by public bodies, corporations, contractors etc?</p>
<p>No</p>	
8e	<p>If the identity of a person, company, etc, is likely to be disclosed or inferred or discoverable, how will this be discussed with the potential participant(s), and what impact might the outcomes of this have on the proposed project?</p>
<p>The participant information sheet outlines that the investigator will only know their identity if they agree to take part in the follow up interview. It is not expected that such outcomes will have any effect on the proposed research project. All personal details such as email addresses for follow up interviews will be kept on a password locked computer and destroyed 5 years post completion of the study in line with the Data Protection Act (1988). Due to research purposes only the student investigator and supervisors will have access to the data.</p>	
8f	<p>How will any participants or subjects be clearly informed about any limits to confidentiality, their rationale and the possible outcomes?</p>
<p>This will be made clear in the participant information sheet and verbally before the follow up interview takes place. All electronic data will be stored on student investigators password locked computer. All information and data gathered during this research will be stored in line with the Data Protection Act (1988) and be destroyed 5 years post completion of the study. Due to research purposes only the student investigator and supervisors will have access to the data.</p>	

9	Project Design
9a	<p>Has statistical or methodological advice been sought on the size and/or design of the project? If so, from whom?</p>

Yes: Samantha Nabb and Hollie White	
9b	If a questionnaire is to be used, it is recognised that this may be subject to change during the life of the project. The remit of the questionnaire and an advanced draft of this must be included, with, where possible, an outline indication of the expected development of the enquiry.
See attached	
9c	If interviews (structured or semi-structured) are to be used, it is recognised that these may be subject to change during the life of the project. The remit of the interviews and an advanced draft of their format must be included, with, where possible, an outline indication of the expected development of the enquiry.
The follow up interview will be used to gain more valuable information. A draft version of the follow up interview has been attached, however there is the expectation that the information gained through the online survey could result in changes to the interview questions and appropriate ethical approval with be sought.	
9d	If procedure(s) are to be carried out on the participants, what are these?
<p>Following the recruitment process outlined in section 7, participants will be asked to click on the link to the online survey. Participants will be expected to work through a series of questions at the end of which there will be an opportunity for them to indicate their willingness to take part in a follow up interview by leaving a contact email address.</p> <p>Follow up interviews will take place over the telephone and be audio recorded. Participants will be reminded regarding consent and procedures prior to the interview taking place and that they are free to withdraw at any time. The participant will be reminded they will not be referred to by name in the interview to continue to secure anonymity.</p>	
9e	Is the researcher and/or Research Supervisor qualified to carry out these procedures?
Sarah Henderson will conduct all surveys and is qualified to carry out these procedures.	

10	Covert Research: if the project involves covert research, give details here
Explain the rationale for the use of this approach and explain why it is necessary to use this particular methodology successfully to undertake the research and achieve its purpose and aims.	
n/a	

11	Secondary datasets: if the project involves secondary data, give details here
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11a	Describe the size and nature of the group and the rationale for selection. Who holds the documents and data?
n/a	
11b	Are there any limits or restrictions placed on access to and/or use of these documents or data?
n/a	
11c	Statement of permission for use from all document/data holders, including any restrictions, must be included here.
n/a	

12	Dissemination of Results
12a	What is the planned method of dissemination? (eg, undergraduate dissertation, doctoral thesis, research report, intended publication in...)
Doctoral thesis, intended publication in Journal of Science and Medicine in Sport/Journal of Sport Rehabilitation/Journal of Athletic Training.	
12b	Will any restrictions be placed on the dissemination/publication of results?
No	

13	Data Security and Disposal
13a	Is the researcher aware of the requirements of the Data Protection Act? (eg: has the processing of the data been considered; have the operations necessary been identified; and has the issue of the sensitivity of the data been considered in relation both to data protection and general lawfulness?)
This study will adhere to the Data Protection Act (1988). All electronic copies of data will be stored on the student investigators password protected computer. 5 years after completion of the study all documents will be destroyed and electronically deleted.	
13b	What provisions have been considered for the secure retention of sensitive or personal data?
No sensitive data will be collected as a result of this study; however personal details will be obtained for follow up interviews. Please see section 8 regarding confidentiality and anonymity.	
13c	What provisions are in place for the secure destruction of this data, and when is it anticipated that this should take place?
5 years after completion of the study, all documents will be destroyed and electronically deleted.	

13d	Where results are collected individually, but the outcomes are anonymised, what data protection procedures are in place to ensure the protection of personal details and at what point and how will these be destroyed?
For follow up interviews, names and contact details will need to be obtained for the purpose of the study; however during data analysis and write up participants will be coded.	

14	Intellectual Property
14a	Is the researcher aware of the wide variety of reproduction methods which are restricted in respect of protected data; and the possible implications of any copyright infringements?
Yes	
14b	Have any relevant permissions in respect of this been obtained (eg, the use of unpublished material)?
n/a	
14c	If online material is being used, are there any international laws which impact on this?
n/a	
14d	Is there knowledge of how to use licences and assignment of rights when creating or using material protected as intellectual property?
n/a	

15	Independence
15a	Is the project externally funded? If so by whom? Does this entail any actual or potential conflict of interest?
No	
15b	Has the funding body placed any restrictions on the conduct or publication of the research?
No	
15c	Is it intended that application will be made to an external funding body subsequent to receipt of faculty approval? If so, to whom? Is it fully understood that if any subsequent application is made to an external funding body, and that body seeks to impose any restrictions or conditions on the project, that this must be reported to the faculty and approval granted for these restrictions or conditions?

No

16	Overseas Research: if the project is based overseas (outside of the UK), give details here
16a	In which country or countries is it proposed that the investigation take place?
n/a	
16b	Is the proposal in accordance with the laws of the country or countries in which it is proposed that the investigation take place, and how has this been ascertained?
n/a	
16c	Does the proposal comply with local laws on Data Protection and Intellectual Property? If yes, how has this been ascertained?
n/a	

17	Collaborative projects: if the project is a collaboration, give details here
17a	With which institutions is the project being conducted and who is the project director?
No	
17b	Has ethical approval been given by all other institutions involved? (Confirmatory documentation must be included). If ethical approval is in process, when is this expected to be completed?
n/a	
17c	What processes have been put in place, or will be put in place, to ensure ethical compliance across all elements of the project?
n/a	

FOR PROJECTS INVOLVING RISK CATEGORY 2 AND 3: DECLARATION AND SIGNATURE/S

STUDENT/RESEARCHER/APPLICANT

I confirm that I will undertake this project as detailed in stage one and stage two of the application. I understand that I must abide by the terms of this approval and that I may not make any amendments to the project without further approval. I understand that research with human participants must not commence without ethical approval.

<i>Signed</i>	S. Henderson	<i>Date</i>	12/08/2014
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RESEARCH SUPERVISOR/DIRECTOR OF STUDIES RECOMMENDATION FOR STUDENT PROJECTS

I confirm that I have read stage one and stage two of the application. The project is viable and the student has appropriate skills to undertake the project. The Participant Information Sheet and recruitment procedures for obtaining informed consent are appropriate and the ethical issues arising from the project have been addressed in the application. I understand that research with human participants must not commence without ethical approval. I recommend this project for approval.

The student has completed a risk assessment form:	Yes N/A
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The student has read an appropriate professional or learned society code of ethical practice:	Yes N/A
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Where applicable, give the name of the professional or learned society:

<i>Name</i>	<i>Samantha Nabb</i>	<i>Signed</i>	<i>Samantha Nabb</i>	<i>Date</i>	<i>18/08/2014</i>
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For projects approved by the Research Ethics Co-ordinator
LOCAL RESEARCH ETHICS CO-ORDINATOR APPROVAL

I confirm ethical approval for this project

<i>Name</i>		<i>Signed</i>		<i>Date</i>	
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For projects that require Faculty level approval
LOCAL RESEARCH ETHICS CO-ORDINATOR'S RECOMMENDATION FOR FACULTY APPROVAL

<i>I recommend this project for consideration at faculty level. It cannot be approved at local level due to the following reason(s)</i>					
<i>Name</i>		<i>Signed</i>		<i>Date</i>	
PROJECTS APPROVED BY THE FACULTY RESEARCH ETHICS COMMITTEE					
<i>I confirm that this project was considered by the Faculty Research Ethics Committee and has received ethical approval</i>					
<i>Chair</i>		<i>Signed</i>		<i>Date</i>	

This form will be retained for the purposes of quality assurance of compliance and audit for FIVE years

INFORMATION TO SUBMIT WITH THE APPLICATION

INFORMATION SHEET AND CONSENT FORM: You must submit the information sheet/s for participants and assent/consent form/s (where appropriate) with the application. You must submit every communication letter and measurement tool e.g. questionnaire that a participant will see or receive. Failure to do so will result in delays to the application.


SUBMISSION CHECKLIST	Tick box (where relevant)
EC1A RISK CHECKLIST AND STAGE 1 – RESEARCH ETHICS APPROVAL FORM	
EC1B STAGE 2/3 – RESEARCH ETHICS APPROVAL FORM	
Research proposal/protocol (no more than 3 pages of A4)	
Participant Information Sheet/s	
EC2 Informed Consent Form/s	
EC2-U18 Assent Form (for children)	
Recruitment documents (eg, posters, flyers, email invitations, advertisements)	
Measures to be used (eg, questionnaires, surveys, interview schedules, psychological tests)	

Letters/communications to and from gatekeepers	
Evidence of any other approvals or permissions (eg, NHS research ethics approval)	
EC3 Risk assessment form	
For projects involving ionising radiation, approval documentation	
Confirmation of insurance cover (required for certain projects – check if in doubt)	
Other: give details here: Evidence of (enhanced) CRB certificate (if appropriate)	
EC4 Pre-exercise medical history questionnaire	
Letters/communications with head teachers	

SUBMISSION DETAILS

Students: please email the completed forms (stage one and stage two) and other relevant documentation (see Submission Checklist above) to your Research Supervisor / Director of Studies.

Staff: **PLEASE MAKE SURE THAT BOTH STUDENT AND SUPERVISOR SIGN THE APPLICATION AND THEN FORWARD ALL SUPPORTING DOCUMENTATION TO ALICIA MILSON, DEPARTMENTAL ADMINISTRATOR FOR PROCESSING.**

Participant Letter of Invitation 

Project title	The use of Elastic Therapeutic Tape in Clinical Practice
Student investigator	Name: Sarah Henderson Email address: S.Henderson@hull.ac.uk Contact telephone number: 01482463380

16/10/2014

Dear Sir or Madam

This is a letter of invitation to enquire if you would like to take part in a postgraduate research project regarding the use of elastic therapeutic taping in clinical practice by the means of an online survey which would last 10-15 minutes to complete.

Before you decide if you would like to take part it is important for you to understand why the project is being done and what it will involve. Please take time to carefully read the Participant Information Sheet on the following pages and discuss it with others if you wish. Ask me if there is anything that is not clear, or if you would like more information.



If you would like to take part please complete and return the Informed Consent Declaration form.


Please do not hesitate to contact me if you have any questions.

Yours faithfully,

Sarah Henderson


Participant Information Sheet

Project title 	The use of Elastic Therapeutic Tape in Clinical Practice
Principal investigator 	Name: Samantha Nabb Email address: S.nabb@hull.ac.uk Contact telephone number: 01482463277
Student investigator	Name: Sarah Henderson Email address: S.henderson@hull.ac.uk Contact telephone number: 01482463380

What is the purpose of this project? 

The central aim of this study is to determine and investigate the use and beliefs of practitioners trained in elastic therapeutic tape (ETT) and why they use it in Clinical Practice. Participants invited to take part will be trained in the use of ETT and therefore their clinical opinion, reasoning and beliefs are of interest especially relating to the appropriate and effective usage of tape with clients or patients.

Following this, investigations between the different types of tape (for example Kinesio Tape, Rocktape, Spider-tech, K-Active) will be analysed. Recent studies have researched the effects of taping on strength, movement analysis and specific joint/muscle injuries such as French (2014) and Williams, Whatman, Hume and Sheerin (2012), but thus far little has been done to research the beliefs of trained clinicians on their use of ETT. Therefore, this research would add to the current literature to highlight ETT's use in clinical practice but also therapists reasoning for using ETT the way they do.

Why have I been chosen? 

You have been chosen because you are an active clinician who is trained in ETT and therefore we are interested in your clinical opinion, reasoning and beliefs as to the appropriate and effective usage of ETT with your clients or patients. We are also interested in your clinical opinion, reasoning and belief regarding the outcomes of using the tape with your clients or patients.

What happens if I volunteer to take part in this project? ⓘ

First, it is up to you to decide whether or not to take part. If you decide to take part you will be asked to complete the online survey via survey monkey. At the end of the online survey there will be an opportunity to leave your email address for follow up interviews, this is not compulsory. A contact name and person will also be provided.

What will I have to do? ⓘ

You will be required to complete an online survey that will last approximately 10-15 minutes. If you consent to a follow up interview, there will be an option to leave an email address which will be used to contact you at a later date to arrange a suitable date for a telephone interview. Follow up interviews will take place over the telephone and be audio recorded at a later date before 31st January 2015. You will be reminded regarding consent and procedures prior to the interview taking place and that you are free to withdraw at any time. To continue to secure anonymity, your name will not be mentioned at any point.

Will I receive any financial reward or travel expenses for taking part? ⓘ



No

Are there any other benefits of taking part? ⓘ

You will be contributing to an online survey that will help to understand the beliefs and usage of ETT in clinical practice which may be published at a later date.

Will participation involve any physical discomfort or harm? ⓘ

Neither the survey or interview will involve no physical discomfort or harm

Will I have to provide any bodily samples (e.g. blood or saliva)? ⓘ

No

Will participation involve any embarrassment or other psychological stress? ⓘ

Neither the survey or follow up interview will include questions that are of low sensitivity and should not cause any psychological stress or embarrassment

What will happen once I have completed all that is asked of me? ⓘ

Once you have completed the online survey and if you consent to a follow up interview no further action will occur.

How will my taking part in this project be kept confidential? ⓘ

The questions will not ask for any personal details. This way, there would be no risk of breach of confidentiality. However, at the end of the study a compulsory email address can be left for follow up interviews. Each entry to survey monkey will be given a unique identifier. You only need to give your name and contact details if you wish to take part in follow up interviews. Data analysis and write up will still be coded securing anonymity of participants. Follow up interview recording will have a code number and will be saved on the student investigators password protected computer.

How will my data be used? ⓘ

The overall results will be fed back to student investigator Sarah Henderson. The data will also be utilised by supervisors: Samantha Nabb and Hollie White. The data will be used to inform future clinical practice, used as the students PhD and also may be used for presentation at conferences.

Who has reviewed this study? ⓘ

This project has undergone full ethical scrutiny and all procedures have been risk assessed and approved by the Department of Sport, Health and Exercise Science Ethics Committee at the University of Hull.

What if I am unhappy during my participation in the project? ⓘ

You are free to withdraw from the project at any time. During the study itself, if you decide that you do not wish to take any further part then you can discontinue the questions as incomplete surveys will be disregarded. If you choose to withdraw from the interview, the recording will be deleted by the student investigator as soon as the phone call has terminated. You do not have to give a reason for your withdrawal. Any personal information or data that you have provided (both paper and electronic) will be destroyed or deleted as soon as possible after your withdrawal. After you have completed the research you can still withdraw your personal information and data by contacting the person named in Section 18. If you are concerned that regulations are being infringed, or that your interests are otherwise being ignored, neglected or denied, you should inform Dr Lee Ingle, Chair of the Department of Sport, Health and Exercise Research Ethics Committee, who will investigate your complaint (Tel: 01482 463141; Email: l.ingle@hull.ac.uk)







How do I take part?




Contact the investigator using the contact details given below. She will answer any queries and explain how you can get involved.

Name: Sarah Henderson Email address: S.Henderson@hull.ac.uk Tel number: 01482463380



Risk Assessment Form




When used as part of a research ethics application it is the principal investigator’s responsibility to ensure that this form has been completed properly. This includes ensuring that the level of risk has been appropriately assigned, that the associated hazards are acceptable, and that all appropriate control measures have been put in place before, during, and after the testing procedure in order to *minimise each specific risk* associated with the testing procedure. Where the risk assessment is being completed as part of an undergraduate or postgraduate project, it is the student’s responsibility to complete the form, and the supervisor’s responsibility to evaluate the form and request revisions where appropriate.

1. Procedure covered 	Online Survey	
2. Location covered 	Great Britain	
3. Those at risk 	Student investigator and participants	
4. Assessor (principal investigator) 	Sarah Henderson	
5. Date of assessment 	11/08/2014	
6. Review dates (for office use only) 	Click here to enter a date. Click here to enter text.	Click here to enter a date. Click here to enter text.
	Click here to enter a date. Click here to enter text.	Click here to enter a date. Click here to enter text.

Hazards 	8. Specific control measures 	9. Risk (S x L) 
Consent	<p>Explain Hazard: Adequate consent must be obtained</p> <p>Control measure: Participants will be fully informed regarding the online survey and participants who complete the survey will be deemed to have consented to the online survey.</p>	1x1
The participant may become frustrated at the length of the survey	<p>Explain Hazard: Participants may become frustrated with the time taken to complete the online survey.</p> <p>Control measure: The participant will be fully aware regarding the duration of the survey, that the survey will take 5-10 minutes to complete.</p>	1x2
Limitations on feedback	<p>Explain Hazard: Participants may take offense in relation to no immediate feedback following the survey.</p> <p>Control measure: Participants will be informed that the nature of the study would not allow immediate feedback</p>	1x1
Data handling	<p>Explain Hazard: Inappropriate handling of data collected from the study.</p> <p>Control measure: All data will be kept on the student investigator's password protected computer. Data will only be shared with the research team. No other external parties will have access to this information. All data will be deleted after 5 years post completion of study.</p>	1x1







Coercion	<p>Explain Hazard: Participants may feel worried/ pressured or obligated to participate in the online survey.</p> <p>Control measure: Participants will be approached via email which will contain a link to the online survey. The text from the participant information sheet will be used as the opening web page of the survey so that participants are able to confirm that they have read, understood and consented to taking part in the online survey. It is the participant's choice whether to participate in the research project or not. During the consent process, participants will be advised that they can withdraw from the study at any point without providing any reason for doing so or any adverse implications.</p>	1x2
Confidentiality and Anonymity of the participant	<p>Explain Hazard: Participants may become concerned about any information that they provide being revealed therefore them being identified.</p> <p>Control measure: Research will conform with legislation relating to the Data Protection Act (1988). Identifiable information will not be published or made available to anybody not involved in the research. Access to the research data is limited to the research team. All reasonable steps will be taken to ensure that confidential details are secure – data will be coded and kept on a password protected computer.</p>	1x3




10. Are controls adequate? 	<p style="text-align: center;">Yes No</p>
11. Additional controls or remedial action required 	<p>Click here to enter text.</p>

<p>12. General control measures </p>	<p>Undergraduate students testing in the department's laboratories will be supervised by a staff member at all times. A first aider will be present at all times. In case of emergency contact Extension 5555.</p> <p>General Control Measures</p> <ol style="list-style-type: none"> 1. Pre-exercise medical questionnaire. Testing may only be permitted following satisfactory completion of the pre-exercise medical questionnaire whereby no contraindications to exercise or any aspect of the full testing procedure have been highlighted. 2. Informed consent form. Testing may only be permitted following the subject's informed consent concerning all aspects of the testing procedure. 3. Strict adherence to test protocol. 4. Close monitoring of subject by a test administrator. 5. Feedback and communication is maintained between the subject and the experimenter throughout the test. 6. Termination of test if discomfort to subject is deemed excessive.
<p>13. Emergency procedures </p>	<ol style="list-style-type: none"> 1. Emergency first aid available on site within the department. All test administrators will have full knowledge of what action to take in an emergency, as outlined in the departmental Health and Safety Policy. 2. Cleaning agents and equipment will be readily available to clean up any sweat, saliva, blood or vomit. 3. In case of emergency contact Extension 5555. 4. If any severe feeling of discomfort is signalled by the subject or seen by the administrator, then testing will be terminated and further action taken if required.
<p>14. Monitoring procedures </p>	<ol style="list-style-type: none"> 1. All equipment checked regularly prior to use for correct and safe functioning. 2. Continued monitoring of procedures and equipment in case modifications can further reduce risk. 3. Continuous monitoring of the participant during and immediately after the test procedure will occur.



Risk Assessment Form




When used as part of a research ethics application it is the principal investigator’s responsibility to ensure that this form has been completed properly. This includes ensuring that the level of risk has been appropriately assigned, that the associated hazards are acceptable, and that all appropriate control measures have been put in place before, during, and after the testing procedure in order to *minimise each specific risk* associated with the testing procedure. Where the risk assessment is being completed as part of an undergraduate or postgraduate project, it is the student’s responsibility to complete the form, and the supervisor’s responsibility to evaluate the form and request revisions where appropriate.

2. Procedure covered 	Telephone interview	
15. Location covered 	Great Britain	
16. Those at risk 	Student investigator and participants	
17. Assessor (principal investigator) 	Sarah Henderson	
18. Date of assessment 	11/08/2014	
19. Review dates (for office use only) 	Click here to enter a date. Click here to enter text.	Click here to enter a date. Click here to enter text.
	Click here to enter a date. Click here to enter text.	Click here to enter a date. Click here to enter text.

20. Hazards 	21. Specific control measures 	22. Risk (S x L) 
Consent	<p>Explain Hazard: Adequate consent must be obtained</p> <p>Control measure: Participants will be fully informed regarding the telephone interview and participants who take part will be briefed regarding consent before the interview takes place.</p>	1x1
The participant may become frustrated at the length of the interview	<p>Explain Hazard: Participants may become frustrated with the length of the follow up interview.</p> <p>Control measure: The participant will be fully aware regarding the duration of the interview before it commences, that the interview should take no longer than 30 minutes.</p>	1x2
Limitations on feedback	<p>Explain Hazard: Participants may take offense in relation to no immediate feedback following the interview.</p> <p>Control measure: Participants will be informed that the nature of the study would not allow immediate feedback.</p>	1x1
Data handling	<p>Explain Hazard: Inappropriate handling of data collected from the study.</p> <p>Control measure: All digital audio recordings and transcribed data will be kept on the student investigator's password protected computer. Data will only be shared with the research team. No other external parties will have access to this information. All data will be deleted after 5 years post completion of study.</p>	1x1

Coercion	<p>Explain Hazard: Participants may feel worried/ pressured or obligated to take part in the interview.</p> <p>Control measure: Participants will have voluntarily left their email address at the end of a previous online survey, however participants will be reminded they can withdraw at any time during the interview and if they do their data will be destroyed. Participants will be reminded that it is their choice whether to participate in the research project or not.</p>	1x2
Confidentiality and Anonymity of the participant	<p>Explain Hazard: Participants may become concerned about any information that they provide being revealed therefore them being identified.</p> <p>Control measure: Research will conform with legislation relating to the Data Protection Act (1988). Identifiable information will not be published or made available to anybody not involved in the research. Access to the research data is limited to the research team. All reasonable steps will be taken to ensure that confidential details are secure – data will be coded and kept on a password protected computer.</p>	1x3

23. Are controls adequate? 	<p style="text-align: center;">Yes No</p>
24. Additional controls or remedial action required 	<p>Click here to enter text.</p>

<p>25. General control measures </p>	<p>Undergraduate students testing in the department's laboratories will be supervised by a staff member at all times. A first aider will be present at all times. In case of emergency contact Extension 5555.</p> <p>General Control Measures</p> <ol style="list-style-type: none"> 1. Pre-exercise medical questionnaire. Testing may only be permitted following satisfactory completion of the pre-exercise medical questionnaire whereby no contraindications to exercise or any aspect of the full testing procedure have been highlighted. 2. Informed consent form. Testing may only be permitted following the subject's informed consent concerning all aspects of the testing procedure. 3. Strict adherence to test protocol. 4. Close monitoring of subject by a test administrator. 5. Feedback and communication is maintained between the subject and the experimenter throughout the test. 6. Termination of test if discomfort to subject is deemed excessive.
<p>26. Emergency procedures </p>	<ol style="list-style-type: none"> 1. Emergency first aid available on site within the department. All test administrators will have full knowledge of what action to take in an emergency, as outlined in the departmental Health and Safety Policy. 2. Cleaning agents and equipment will be readily available to clean up any sweat, saliva, blood or vomit. 3. In case of emergency contact Extension 5555. 4. If any severe feeling of discomfort is signalled by the subject or seen by the administrator, then testing will be terminated and further action taken if required.
<p>27. Monitoring procedures </p>	<ol style="list-style-type: none"> 1. All equipment checked regularly prior to use for correct and safe functioning. 2. Continued monitoring of procedures and equipment in case modifications can further reduce risk. 3. Continuous monitoring of the participant during and immediately after the test procedure will occur.

Appendix D

Online survey

1. Do you use taping methods in your clinical practice?

-Yes

-No

2. Please select from the following 3 answers which taping you use in your clinical practice

-Athletic or supportive taping (e.g. EAB, Zinc oxide)

-Elastic therapeutic tape (e.g. Kinesiology Tape)

-Both Athletic or supportive taping and Elastic Therapeutic Taping

3. Please specify how long you have been trained in ETT (Please state years and/or months)

4. Please select ONE brand of ETT which you use most in your clinical practice

-Spidertech

-Rocktape

-Kinesio Tape

-Mueller kinesiology

-Sport tape

-Other (please specify)

5. How often do you use elastic therapeutic tape in your clinical practice?

-Most clients

-Half of clients

-Few clients

6. Which of the following clients groups do you work with the most in clinical practice? (1 being the most common you treat to 6 being the least common/not at all)

-Elderly

-Paediatrics

-Athletes

-Lymphoedema

-Neurological

-MSK problems

7. For the group of clients you most commonly work with please select your main aim/goal when using ETT to treat this group of clients

- Injury rehabilitation
- Reduction of inflammation
- Mechanical correction
- Functional correction
- Pain reduction
- Lymphatic drainage
- Performance enhancement
- Increase athletic endurance
- Other (please specify)

8. In as much detail as possible, please state in your own words why you believe ETT can work to achieve your previously stated aim/goals from question 7

9. In as much detail as possible, please state in your own words how you view the evidence base surrounding its use with this primary group of clients

10. How does this evidence base you described in question 9 influence your clinical practice?

11. For the group of clients you ranked second with please select your main aim/goal when using ETT to treat this group of clients

- Injury rehabilitation
- Reduction of inflammation
- Mechanical correction
- Functional correction
- Pain reduction
- Lymphatic drainage
- Performance enhancement
- Increase athletic endurance
- Other (please specify)

12. In as much detail as possible, please state in your own words why you believe ETT can work to achieve your previously stated aim/goals from question 11

13. In as much detail as possible, please state in your own words how you view the evidence base surrounding its use with this secondary group of clients

14. How does this evidence base you described in question 13 influence your clinical practice?

15. For the group of clients you ranked third most commonly treated by yourself, please select your main aim/goal when using ETT to treat this group of clients

- Injury rehabilitation
- Reduction of inflammation
- Mechanical correction
- Functional correction
- Pain reduction
- Lymphatic drainage
- Performance enhancement
- Increase athletic endurance
- Other (please specify)

16. In as much detail as possible, please state in your own words why you believe ETT can work to achieve your previously stated aim/goals from question 15

17. In as much detail as possible, please state in your own words how you view the evidence base surrounding its use with this tertiary group of clients

18. How does this evidence base you described in question 17 influence your clinical practice

19. Please specify your qualified profession

20. Which professional body are you an active member of? Please specify your qualified/primary professional body and if you have any secondary professional bodies

21. Following on from this online survey there is an option for a follow up interview. This would take place over the telephone and be audio recorded at a later date before 20th December 2014. It will last approximately 5-10 minutes. Anonymity will be secured and no names will be mentioned during the interview. The information given in the interview will further enhance the research by expanding on questions from the online survey. You are free to withdraw from the interview at any point and all data will be destroyed. If you are happy to participate in follow up interviews please leave your email address

22. Please use this box to leave any additional comments about your use of ETT, the populations you use it on and your any further reasoning. Please also use this box to comment on the format and content of the questionnaire in general.

Appendix E

Interview questions

Hello, I am Sarah Henderson from the University of Hull. Thank you for participating in this telephone interview. For this interview we will be talking more in detail about your use and beliefs of elastic therapeutic tape in your clinical practice, you have been chosen to partake in this interview, as an email address was left on the online survey which was completed between October and December 2014. The purpose of the study is to research clinician's beliefs and uses of ETT in their clinical practice and this interview is to gain additional information beyond what the survey offered.

I would like to remind you that all information received during the interview will remain strictly confidential. A recording device is going to be used purely to ensure I get complete and accurate information, as I will be typing up the interview into a transcript that will be used for later reference. A copy of the transcript will be sent via email to you to ensure it is an accurate record of the interview and to remove any data if you so wish. Transcripts will be sent via email, by the end of May 2015, if at that stage there are any issues with accuracy and/or data removal you must advise me within **ONE** week. If I hear nothing from you after the transcript is sent I will assume that you are happy with the content and I will use it as outlined for my thesis. At transcription stage all personal details will be removed; any reference to you by name during the interview will be replaced by a pseudonym. It may be that I choose to select some of the information that you give for my thesis, for example a direct quotation from what you said during the interview, however you can be assured that this will not in any way reveal your identity.

As a participant in this study, you have several rights. First, your participation is entirely voluntary, and you are free to decline to comment on any question at any stage. If you find that you have a question during the interview, please feel free to ask straight away. If at any time you do feel uncomfortable about continuing the interview you are free to terminate the phone call and your recording will be destroyed and therefore not used during the write up stage. You also have the right to withdraw at any point of the interview without explanation; again, any recordings which have been taken will be destroyed as soon as the interview has been terminated. Once the interview has been completed, you will be given the opportunity to add anything that you feel you weren't able to express or that was not covered in the interview. As previously mentioned, a copy of the transcript will be sent via email to you to ensure it is an accurate record of the interview and to remove any data if you so wish. Transcripts will be sent by the end of May 2015, if at that stage there are any issues with accuracy and/or data removal you must advise me within ONE week. If I hear nothing from you after the transcript is sent I will assume that you are happy with the content and I will use it as outlined for my thesis.

The interview today is focussing on expanding details from the online survey questions and trying to gain further information and insight into your use of ETT in your clinical practice, why you use it and your beliefs of the tape.

Trained clinicians

First of all I would like you to tell me about your background use with Elastic Therapeutic Tape, or ETT...

prompts

- Methods of use
- Training and level of training
- Length of time of training
- Clarification of client base (main population of clients)

Non trained clinicians

First of all I would like you to tell me about your background with the use of taping in your clinical practice and have you ever thought to use ETT?

Trained clinicians

Following on from your background, I would like to discuss your own successes and failures with the tape (if any) so can you discuss with me your greatest positive outcomes from using ETT (e.g. specific injury/pathology)?

Non trained clinicians

Following on from your background, I would like to discuss any known clinical successes and failures with the tape (if any) that you have witnessed or reflected upon with another colleague?

prompts

- In the same turn, have there been any negative outcomes?
- Has being trained in this field, altered your clinical practice...e.g. increased your use for treatment?
- Is there a pattern with the success/failures in relation to different Populations/injury stage

Both Parties

Ok thank you. Resulting from your background use, what can you tell me about your understanding behind the effectiveness of ETT?

prompts

- How tape is used in clinical setting
- Type of modality (e.g. what ETT used for, pain/recovery/postural/drain)
- Brand recognition
- Justify use of ETT with their qualification (understanding techniques/need further experience in its use)

Both Parties

You've discussed your effectiveness in your practice, next I would like to discuss your subjective opinion of the evidence surrounding the use of ETT and if you think there is sufficient evidence to warrant its use as a modality?

prompts

- How does the evidence base influence your clinical usage if at all?
- Is the available evidence suitable to your clinical practice (e.g. relevant?)

Both Parties

From a client perspective, have you had any clients request its use as a modality and do you believe the awareness or education is there to warrant the request?

prompts

- Client awareness/education
- Client experiences
- Positive/negative attitudes towards modality
- Request of modality as a treatment/refusal as a modality

Trained clinicians

As a final point to the interview, please could you discuss how you feel being trained in the use of ETT has enhanced your continued professional development or CPD if you can linking to evidence based practice

Non Trained clinicians

As a final point to the interview, please could you discuss how you feel being trained in the use of ETT could facilitate or hinder your continued professional development or CPD if you can linking to evidence based practice

prompts

- What is your reasoning behind being trained in this field and why?
- Do you feel that being trained in ETT has enhanced your CPD?
- Would you further train further in the same brand/change brand of training?

*I would like to thank you for your time to speak with me today about your use of ETT in your clinical practice. Your responses will give my study further details into the insight of a clinician's use of ETT. Again, thank you for your time and for participating in this interview. The transcripts will be sent to you via email, please review the transcripts and respond within **ONE** week of receipt any data you would like altered or removed.*

Appendix F

NVivo Coding descriptors and themes

Themes	Coding descriptors
Clinical experience	How long have they been clinically active (NT or T) can also be where they are currently working if they mention without relating to tape
Athletic Taping main uses	From both points of view, what is the athletic training used for.
Environment athletic taping is used	From both view points
Athletic Taping successes	From both view points
Athletic taping opinions	Opinions from clinicians in general
Athletic taping training	Any comments on AT training
Trained opinion of ETT	ETT trained opinions/comments
Non trained opinion of ETT	Non trained opinions of ETT
Understanding of ETT effectiveness	Trained clinicians understanding of the technique
Understanding of non-trained effectiveness	Non trained clinicians understanding of the technique
Opinions on branding of ETT	From both viewpoints (NT & T)
Research into ETT	From both viewpoints (NT & T)
Evidence to warrant ETT use & Research	From both viewpoints (NT & T)
CPD enhancement	How ETT might enhance clinical practice (NT); how ETT has enhanced their clinical practice (T)
Athletic taping failures	Both trained and untrained opinions, in their clinical experience or what they have heard from other clinicians.
ETT failures from trained clinicians	Any failures highlighted by the trained clinician in their experience or witnessed.
ETT failures from non-trained	Any failures highlighted by the non-trained clinician in their experience or witnessed.
ETT success from trained clinicians	Any successes highlighted by the trained clinician in their experience or witnessed.
ETT successes from non- trained	Any successes highlighted by the non-trained clinician in their experience or witnessed.
Education or awareness of ETT	From NT & T: what is their awareness surrounding the tape, how are they educated in what it does. Also if any client opinions from the clinician
ETT experience	How long have they been trained in ETT
Environment ETT is used	From both view points
ETT use in clinical setting	From both view points
Increased use in clinical practice	Has ETT increased the use of the tape as part of their clinical practice

Appendix G

Overarching themes from the interviews with their subthemes

Major Theme	Subthemes
Efficacy of ETT	Effectiveness How tape is used in clinical setting Type of modality (e.g. what ETT used for, pain/recovery/postural/drain) Brand recognition Justify their use of ETT with their qualification (understanding techniques/need further experience in its use)
	Evidence Subjective opinion of evidence base Is evidence base explicit enough to warrant use as a modality Is evidence base suitable to your clinical practice How does the evidence base influence clinical usage
Clinical use of ETT	Background of use Methods of use Training and level of training Length of time since training Client base (main population of clients)
	Own successes or failures Continued positive outcomes (e.g. specific injury effectiveness) Negative outcomes Patterns in modality's use (e.g. different populations/injury stage) Altered clinical practice dependant on these outcomes
	Client perceptions Client awareness/education Client experiences Positive/negative attitudes towards modality Request of modality as a treatment/refusal as a modality
	CPD Enhancement of CPD and why Why train in ETT (relating to evidence base and effectiveness...can link to evidence based practice, would participants further train in the same brand/change brand of training)