

Patient perspectives: explaining low rates of compliance to compression therapy

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ABSTRACT

Background Although varied interventions are used to prevent venous leg ulcers (VLUs), compression therapy remains the gold standard for VLU prevention and treatment¹⁻³. However, non-compliance remains an issue. What is it then that makes it difficult for patients to comply? Subsequently, this review paper aims to explain the reasons and contributing factors that attribute to patients' non-compliance to compression therapy with a view of finding strategies that can increase adherence.

Method A literature search was undertaken using the terms 'compression therapy', 'compliance' and 'venous leg ulcers'. Articles that reported reasons for non-compliance or adherence to compression therapy were included. Seventeen articles met the inclusion criteria. The reasons for non-compliance were tabulated and subjected to thematic analysis.

Results Five determinant themes regarding patients' reasons for non-compliance with compression therapy emerged – pain and discomfort, psychosocial issues, knowledge deficit, physical limitations, and financial issues.

Discussion Compliance with compression is the key to achieving wound healing in patients with VLUs but compliance rate remains low. Consequently, effort needs to be made by healthcare professionals (HCPs) to improve compliance and therapeutic relationships through holistic patient assessment that addresses their experiences and

values their individualism, health beliefs, lifestyle and social networks^{4,5}. Further studies to identify intervention strategies that can increase their compliance are required.

What is known on this topic?

- Evidence-based guidelines for the prevention and management of VLUs recommend compression therapy as the gold standard treatment strategy for VLUs.
- Uptake and compliance with compression therapy promotes VLU healing and can prevent recurrence when compared to no compression.
- Many patients cannot tolerate or comply to compression therapy.

What this paper adds

- Being non-judgemental and supportive allows HCPs to monitor patients' beliefs and health behaviours about compression therapy, and this also assists them in planning individualised intervention strategies that can increase compliance rates.

INTRODUCTION

Compression therapy is the cornerstone of management for patients with chronic venous insufficiency¹⁻⁷. Likewise, evidence-based treatment from HCPs also recommends it as the gold standard treatment for venous ulceration, and clinical trials have proved it to be effective in healing VLUs and preventing their recurrence^{1,6,8-11}. Venous leg ulcers significantly impact patients' socioeconomic status, reducing their quality of life and productive work time^{4,5}. Furthermore, Balcombe et al.⁵ believe that, in Western countries, its care accounts for 2% of the healthcare budget. Notably, a Cochrane review confirmed that ongoing compression therapy post-healing reduces recurrence at 3 years compared to no compression⁸.

However, despite the clear benefits of compression therapy in VLU management, poor compliance affects this outcome and, according to Armstrong and Meyr⁶, approximately

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60–70% of patients are non-compliant, especially with paste compression bandages. Consequently, recurrence often occurs, with estimates as high as 70%, thereby causing frustration to patients and HCPs and negatively affecting therapeutic relationships⁸.

As pointed out by Bainbridge⁷, the terms compliance, adherence and concordance are mainly used in the literature to describe the extent to which patients' behaviour matches the agreed recommendations from the HCP. However, whilst the term compliance has been traditionally used, lately it has been viewed negatively as it gives the impression that patients should be yielding or submitting to recommendations from the prescriber. Instead, adherence is considered to capture the concept that the patient is agreeing to a plan, rather than having one imposed; concordance refers to patient satisfaction and the establishment of cooperative therapeutic relationships with HCPs^{7,12}. All of these require participation from both the patient and the HCPs to determine the course of the agreed behaviour that the patient can follow. As such, these terms will be used in this paper interchangeably.

The aim of this paper is to review available data on the reasons for patients' low rate of compliance to compression therapy, subject results to analysis, and then discuss the contributing factors with a view of reversing this trend.

LITERATURE SEARCH / METHODOLOGY

A systematic literature search was performed covering the period from January 2009 to May 2019 using the CINAHL Complete (via EBSCO host), EMBASE, EMCARE, MEDLINE and PubMed via Ovid SP, the Cochrane Library and UpToDate databases using the search terms and Boolean operators venous leg ulcers AND compression AND compliance. The initial search identified 13 articles of high relevance. Only peer-viewed articles in English were included. The search was widened using the truncation terms 'attitude*' or 'perspectiv*' or 'view*' or 'complan*' and 64 articles were returned. Same limiters were applied, duplicates removed, and a further 25 articles were identified.

The reference list of the identified 38 articles was then hand searched for papers of importance and to identify key researchers in the field, and a further six articles were retrieved. The full texts of these 44 articles were screened, and 27 articles excluded as they did not discuss reasons for patients' non-compliance with compression therapy. Finally, a total of 17 articles were included in the literature review.

RESULTS

The full texts of the chosen articles were read, and the reasons for patients' non-compliance as reported in each article were tabulated – this information is provided in Table 1. The reasons for non-compliance are diverse and the list is extensive, with significant overlaps between studies. Based on current evidence, it is impossible to accurately predict or anticipate patient compliance because of the complexity

of the issue, therefore researchers^{7,13} concluded that every patient has the potential for non-compliant behaviour. Only four of the included studies reported the identified reasons for patients' non-compliance to compression therapy as a primary area of investigation^{1,7,14,15}. The majority of the studies included were reviews, and some of them were more comprehensive because the authors undertook thematic analyses of their literature searches^{1,3,13,16}.

Numerous review articles discussed randomised controlled trial (RCT) results that demonstrated the effectiveness of different compression therapy systems on VLU healing and its long-term benefit as an intervention for preventing recurrence^{1–3,6,13,15,16}. Armstrong and Meyr⁶ report healing rates of more than 97%, Stanton et al.¹¹ 93% at 7 months, and Moffatt et al.¹⁶ 97% at 40 months as compared to 55% in the control group.

Determinant factors contributing to non-compliance

Thematic analysis of the findings in Table 1 was undertaken, and five determinant factors contributing to patients' non-compliance to compression therapy were identified and discussed. Pain^{1–4,7,8,11,13,14,16–18} and discomfort^{1–4,6,7,9,13,15–19} were key factors that emerged, followed by psychosocial issues^{1–4,7–9,11,13–18}, knowledge deficit^{1,3,7,8,11,13,14,16,17}, physical limitations^{1,4–9,13,16–18}, and financial issues^{1–3,5,9,16,18}.

Pain and discomfort

Pain and discomfort have been revealed as patients' most important symptom and is identified as likely the primary reason why they seek HCP help^{4,7,13}. For example, they expressed itchiness, irritation and sweating as a result of heat and skin problems^{2,6,13,15–17,19}. Consequently, if these are poorly managed patients, they may lose confidence and belief in the HCP which may contribute to non-compliance^{7,11}. For example, one known aspect of compression therapy is that, initially, it can be painful, hence, if this fact is not clearly explained to patients, it may become a reason for them to be non-adherent to or discontinue treatment⁷.

Past RCTs concluded that compliance is greater with lower degrees of compression, therefore, this may be a logical approach for HCPs to consider^{8,9,17}. Moreover, HCPs can alleviate some of these symptoms by undertaking holistic assessments when selecting compression therapy, ensuring good fit and effective pain management, prescribing an easy application aid, and recommending a comprehensive skin care regime^{1,5,19}. For example, results from an RCT with 47 participants undertaken to address the discomfort of compression stockings concluded that the Jobst Opaque SoftFit compression stockings which contain a silicone yarn at the top band were more comfortable and yield better compliance compared with the traditional stocking that has a slightly higher pressure top band¹⁹.

Overall, in order to establish effective therapeutic relationships and trust, HCPs need to listen to the patients' experiences, assess the causes and impact of pain, and include the

Table 1. Reasons for low rates of non-compliance to compression therapy as reported in the literature.

Authors	Design	Title	Reasons for non-compliance
Anderson (2015) ⁴	Narrative review	Optimising concordance with compression hosiery in the community setting	<ul style="list-style-type: none"> • Pain and discomfort • Choice and acceptability leading to hosiery not being worn • Loss of control and motivation with long-term therapy • Mobility and dexterity issues • Cognitive ability • Application and removal difficulties • Recurrence impacting on patient/HCPs relationship
Armstrong & Meyr (2018) ⁶	Literature review	Compression therapy for the treatment of chronic venous insufficiency	<ul style="list-style-type: none"> • Itching • Tightness • Difficult with application • Pins and needle sensation • Rash
Bainbridge (2013) ⁷	Exploratory review	Why don't patients adhere to compression therapy?	<ul style="list-style-type: none"> • Pain and discomfort • Lack of knowledge and understanding of the underlying disease • Previous negative experience • Poor communication with HCP • Lack of trust of the HCP • Aesthetics / body image, like not wanting to exercise as others would see the bandaged legs • Health locus control: believing their health outcome is not influenced by their actions • Depression • Level of self-efficacy
Balcombe et al. (2017) ⁵	Literature review	Approaches to the application and removal of compression therapy: a literature review	<ul style="list-style-type: none"> • Application and removal difficulties • Knowledge deficit • Dexterity • Cost
Boxall et al. (2019) ¹	Thematic analysis	Compression bandaging: identification of factors contributing to non-concordance	<ul style="list-style-type: none"> • Knowledge deficit • Resource deficit • Psychosocial issues • Pain/ discomfort • Physical limitations
Brown (2014) ¹⁴	Exploratory review	Evaluating the reasons underlying treatment non-adherence in VLU patients: introducing the VeLUSET Part 1 of 2	<ul style="list-style-type: none"> • Pain and discomfort • Patient belief that it is ineffective or unnecessary • Inconsistent lifestyle advice from HCPs • Poor motivation • Knowledge deficit
Brown (2018) ⁸	Narrative review	Self-care strategies to prevent venous leg ulceration recurrence	<ul style="list-style-type: none"> • Lack of knowledge • Application and removal difficulties • Difficulties in using hosiery devices • Pain • Patient and HCPs' poor relationship • Patient beliefs

Table 1 continued. Reasons for low rates of non-compliance to compression therapy as reported in the literature.

Authors	Design	Title	Reasons for non-compliance
Finlayson et al. (2014) ⁹	Prospective longitudinal study	Venous leg ulcer recurrence: deciphering long-term patient adherence to preventive treatments and activities	<ul style="list-style-type: none"> • Depression • Lack of social support • Discomfort • Difficult to apply • Expensive
Kankam et al. (2017) ¹⁷	Literature review	A summation of compliance and complications of compression hosiery for patients with chronic venous disease or post-thrombotic syndrome	<ul style="list-style-type: none"> • Pain and discomfort • Skin sensitivity • Difficulties in donning stockings • Too hot • Dissatisfaction with appearance • Worsening oedema • Cramps • Expensive • Forgetting instructions • Unwillingness to wear
Kapp & Miller (2014) ¹⁸	Qualitative exploratory study	The experience of self-management following leg ulcer healing	<ul style="list-style-type: none"> • Pain and discomfort • Difficulties in applying and removing compression stockings • Difficulties in using stocking applicators • Intrusiveness of supports; not wanting people's assistance to come in their house to apply and remove stockings • Intrinsic factors associated with compression stockings like feeling claustrophobic • Cost
Latz et al. (2015) ²	Literature review	Compression therapies for chronic venous leg ulcers: interventions and adherence	<ul style="list-style-type: none"> • Heat accumulation • Inconvenience • High cost • Pain • Patient belief of compression therapy efficacy
Moffatt et al. (2009) ¹⁶	Literature review	Venous leg ulcers: patient concordance with compression therapy and its impact on healing and prevention of recurrence	<ul style="list-style-type: none"> • Lack of education about VLU • Pain and discomfort • Skin irritation • Leakage of exudate • Difficulty in putting on the stockings • Aesthetic and cosmetic issues • Restricted choice of footwear • Restricted ability to shower • Poor relationship with HCPs • Poor social relationships • Additional life stress • Cost

Table 1 continued. Reasons for low rates of non-compliance to compression therapy as reported in the literature.

Authors	Design	Title	Reasons for non-compliance
Munter (2015) ¹⁹	Survey	Effect of a new compression on adherence: results of a patient satisfaction survey	<ul style="list-style-type: none"> • Discomfort • Unwillingness to tolerate any stocking-related restrictions • Inability to perform everyday chores • Poor fit • Legs become too hot
Stanton et al. (2016) ¹¹	Exploratory review	Promoting patient concordance to support rapid leg ulcer healing	<ul style="list-style-type: none"> • Lack of patient understanding • Clinicians' lack knowledge or experience – poor patient education • Pain • Social isolation • Past negative experiences • Patient belief that healing was impossible
Van Hecke et al. (2009) ¹³	Literature review	A review of why patients with leg ulcers do not adhere to treatment	<ul style="list-style-type: none"> • Pain and discomfort • Limited patient understanding • Patient belief that compression is ineffective, and their ulcer won't heal • Conflicting advice from HCPs • Poor communication with HCPs • Work issues • Long duration of treatment leading to cost issues • Aesthetic issues • Too hot, itchy, and skin issues • Footwear issues • Dressing wet or soiled • Lack of social support leading to actions like delaying healing deliberately in order to prolong nursing visits • Application and removing difficulties • Forgetting instructions • Low self-esteem • Social context • Bandages interfered with mobility
Weller et al. (2016) ³	Cochrane systematic review	Interventions for helping people adhere to compression treatments for venous leg ulceration	<ul style="list-style-type: none"> • Pain and discomfort • Lack of valid lifestyle advice • Knowledge deficit
Ziaja et al. (2010) ¹⁵	Survey study	Compliance with compression stockings in patients with chronic venous disorders	<ul style="list-style-type: none"> • High cost • Sweating • Itching • Cosmetic issues • Oedema exacerbation • Increased wound exudate, leakage • Not recommended by the primary physician • Cut off circulation • Did not help

multidisciplinary team when managing related complications like chronic back pain^{4,8}. Concurrently, inclusion of this may help in achieving treatment outcomes as well as improving patients' quality of life and reducing healthcare costs^{11,19}.

Psychosocial issues

Poor relationships with HCPs were frequently reported as one of the main contributing factors to non-concordance to compression therapy^{1,4,7,8,13,14,16}. To strengthen this relationship, there is a need for honest and open discussion about the nature of VLU, their recurrence, and compliance issues between the HCP and the patient^{7,14}. Likewise, valuing patients' individuality and social support when prescribing compression therapy is equally important¹⁴. Other reasons revealed in this category include patients' health beliefs like the acceptance of ulcers as part of their life^{1,2,7,11,13-15}, the social impact of treatment, aesthetic and cosmetic issues^{1,7,13,15-17}, mental health issues^{1,4,7,9,13,18}, and lack of motivation and trust with HCPs linked to recurrence issues and long-term therapy^{1,4,7,13}.

Similarly, the health belief model suggests that lack of belief in treatment can diminish patients' motivation to commit to it and, as cited, patients therefore do not believe in compression therapy efficacy^{1,2,8,11,13,14}. Equally, high recurrence rates contribute to this belief, as well as depression^{1,7,9} and negative past experience^{1,4,7,11}. Subsequently, patients can perceive this as treatment failure^{1,2,13-15}, and hence this explains the low compliance rates. Social issues such as impact on body image^{1,7,15-17}, inability to wear clothing of choice^{1,13,16}, inability to shower as desired^{1,16}, and restrictions on social activities causing social isolation^{1,9,11,13,16} were also reported.

Collectively, all of these factors negatively reduce the acceptance level of compression therapy. Bainbridge⁷ suggests that having a non-judgemental relationship with HCPs is highly regarded with patients and, subsequently, it dispels any trust issues and positively increases concordance to treatment. Likewise, Anderson⁴ suggests that verbal encouragement, empathy and constructive positive feedback from HCPs and significant others can increase compliance. The key is for HCPs to focus on finding the cause of the non-concordance behaviour rather than assuming that it is a 'social ulcer' phenomenon^{11,13}.

Knowledge deficit

Clinical experience has demonstrated that knowledge is power and, when it is lacking, misperception sets in. As such, lack of knowledge and understanding of underlying disease^{1,3,5,7,8,13,14,16} or rationale behind compression therapy^{1,16} were reasons cited for non-concordance. Contributing factors included receiving conflicting advice from HCPs^{1,11,13,14}, poor communication with HCPs^{1,7,11,13,15}, and memory issues^{1,4,13,17}. Since patients' knowledge and understanding of disease and treatment has been proven to influence concordance to treatment interventions, without adequate information they therefore cannot make informed choices^{7,14}. Likewise,

Balcombe et al.⁵ concludes that, when equipped with relevant knowledge, patients can be self-sufficient with compression garments' application and require less reliance on HCPs and carers. On the other hand, patients rely on the HCPs for information and, if the HCP is inexperienced¹¹ or has poor communication skills^{7,13}, this lack of skill and knowledge consequently increases the non-adherent behaviour.

One qualitative study to validate the impact of an e-learning package on recurrence prevention with 12 participants aged between 51–90 years concluded that all but one participant continued to wear compression long-term for recurrence prevention¹⁸. These findings support the known fact that the provision of evidence-based programs like the Leg Ulcer Prevention Programme (LUPP) promotes life-long healthy behaviour change, especially when introduced early¹⁸. Similarly, Bainbridge⁷ suggests that written instructions with verbal reinforcement are more effective than the former alone. So, to enhance patients' commitment to care, effective communication methods need to be established so that patients can receive clear, consistent information from motivated, skilled and supportive HCPs who take into consideration their individuality, culture, and cognitive and health literacy^{7,14,16}.

Physical limitations

Inability or difficulties in applying and removing hosiery^{1,4-6,8,9,13,16-18} and mobility and dexterity issues^{1,4,5} were the main barriers to compliance cited by patients. Applying a compression garment requires the ability to bend and good dexterity to pull it up. Hence, restrictions as a result of obesity may not be apparent to HCPs and, likewise, patients may not be willing to disclose the real reason why they cannot self-care nor adhere to prescribed treatment^{4,5}. Often, VLU patients have co-morbidities such as osteoarthritis, poor eyesight and chronic back problems that may already be impacting on their abilities to self-care and, as such, the addition of managing compression therapy may be too overwhelming for them to comprehend^{3,4,7,14}.

Ongoing therapeutic relationships with patients will have good treatment outcomes, hence HCPs need to undertake a holistic, individualised approach to care and utilise social support and the multidisciplinary team where possible in managing barriers related to cognitive and dexterity issues^{1,4,7,15}. Moreover, involving patients in decision-making regarding their treatment options and ensuring that they can manage their own therapy as much as possible – taking into consideration the use of different application aids available – has been shown to improve concordance^{4,5}. Likewise, Balcombe et al.⁵ believe that the use of foot slips and frames eases the application and removal of compression stockings and helps to overcome barriers such as dexterity and inability to reach forward to the feet. To alleviate these limitations, HCPs need to either prescribe compression hosiery and a suitable aid together, or consider other alternative types of compression like altered compression design or adjustable

compression wrap in cases where hosiery is unsuitable and, if possible, arrange a trial of available samples of aids beforehand⁵.

Financial issues

Since VLU take weeks or months to heal and often recur post-healing, their treatment distresses patients, affects their quality of life, and is costly^{2,3,17}. Other reasons for non-compliance include work issues, the high cost of compression therapy and essential accessories, and the long duration of treatment^{1,2,5,9,13,15-18}. Although evidence suggests that the use of aids eases the application and removal of compression stockings and promotes self-care, cost remains a barrier^{5,8}. Kapp and Miller¹⁸ conducted a qualitative research with 12 participants aged between 51–90 years and concluded that, among other cited reasons of non-adherence, cost was the most cited, with participants stating that they could not replace nor afford an extra pair.

Armstrong and Meyr⁶ report that in the United States the cost of compression hosiery of at least 30–40mmHg is covered by insurance but, unfortunately, in most other countries, the patient, plus or minus the healthcare services, covers the cost. A survey conducted in Poland to evaluate non-compliance with compression stockings revealed that 37.9% of the 16,770 participants discontinued treatment due to economic reasons¹⁵. Again, multidisciplinary involvement like social workers may be beneficial to assist patients facing this barrier. Overall, HCPs need to discuss with patients associated cost and long-term benefits when prescribing compression treatments and, if concerns are raised, they need to consider other alternative ways of lessening this barrier like the provision of treatment in clinics rather than in-home.

CONCLUSION

Despite the identified reasons and contributing factors that contribute to patients' non-compliance or concordance with compression therapy, it still remains the cornerstone of VLU prevention, treatment and recurrence when adhered to¹⁻⁷. The analysis of the contributing factors established that compliance is a shared responsibility between the patient, HCPs and policymakers. Furthermore, this review has supported the known fact that holistic patient assessment, support and effective communication skills by HCPs forms the basis of therapeutic relationships. Concurrently, maintaining this therapeutic rapport provides a platform for HCPs to identify and understand the key experiences that lead to patients' non-compliance and helps them implement tailored intervention strategies that can increase their commitment to care. Similarly, an honest collaboration of care – such as making patients aware of potential adverse effects like pain, discomfort and cost issues – is also essential. Therefore, in order to maximise benefits with compression therapy, innovation in treatment methods as well as future studies are needed to identify predictors of non-compliance behaviours and to assess the strategies that can be used to improve patients' compliance^{3,17,19}.

CONFLICT OF INTEREST

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