“I don’t want to manage it, I want to get rid of it”:

A narrative analysis of living with chronic plaque psoriasis,

and an investigation into vitamin D as a treatment

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Abstract

As a chronic skin disease, plaque psoriasis can cause significant psychosocial, emotional and physical burden. Psoriasis sufferers perceive others as lacking understanding around what it is like to live with this condition, and there has been little research exploring the experience of psoriasis in depth. The burden of psoriasis can be compounded by the difficulty of treating it, and the inconveniences, side effects and risks of available treatments, suggesting the importance of finding a safe, effective and convenient treatment for psoriasis. Vitamin D and psoriasis have a long-standing relationship, with topical vitamin D analogues used to treat mild-to-moderate disease, and observational studies suggesting an association between higher systemic vitamin D (serum calcidiol) concentrations and less severe psoriasis. These findings suggest vitamin D_3 supplements, which raise serum calcidiol concentrations, might improve psoriasis. In this thesis, two studies were conducted to address the limited in-depth understanding of the experience of psoriasis, and the need for a safe, effective treatment, respectively. The aims were 1) to gain a deeper understanding of the experience of living with psoriasis; and 2) to investigate whether oral vitamin D_3 supplements can effectively treat psoriasis.

For 1), data from semi-structured interviews with 10 men and women with psoriasis was analysed using narrative analysis. Narrative trajectories involving three predominant narrative forms shaped participants' stories: *restitution*, where the focus was on overcoming psoriasis through trying to find an effective treatment or cure; *chaos*, where psoriasis was experienced as overwhelming and brought about a sense of hopelessness, and *resignation*, which was centred on begrudgingly accepting psoriasis in order to be able to get on with life. Participants had different narrative trajectories and shifted between forms over time, with the nature of experience linked with the relative stability and severity of a person's psoriasis and their beliefs about their ability to manage it.

For 2), a randomised, double-blinded, placebo-controlled trial was conducted with 101 participants ≥ 18 years allocated to 100,000 International Units (IU) vitamin D_3/month (n = 67)

for 12 months (200,000 IU at baseline), or an identical placebo (n = 34). Psoriasis severity (Psoriasis Area and Severity Index [PASI]) and serum calcidiol concentrations were assessed at 3-monthly intervals. The primary outcome was the difference in PASI between treatment and placebo over time, assessed using a linear mixed model. Psoriasis severity did not differ between groups at any time (group $F(1, 106) = 0.59$, $p = 0.44$, group*time $F(4, 370) = 0.52$, $p = 0.72$). Yet these findings are inconclusive, as serum calcidiol significantly increased from baseline in both the treatment and the placebo group, and a mild improvement in PASI score from baseline also occurred in each group. A non-predetermined secondary analysis was performed by assessing the strength of the relationship between serum calcidiol concentration and PASI score across the whole sample, and this showed a significant inverse relationship between the two variables, in that elevation of serum calcidiol concentration by increments from 25 nmol/L to 125 nmol/L was associated with very mild decreases in PASI (estimated range of decrease 0 – 2.6; $p = 0.002$). Therefore, despite being unable to determine a benefit of vitamin D_3 supplements for psoriasis, these findings support the notion of a potential benefit of increasing serum calcidiol concentrations across the psoriatic population.

In conclusion, this thesis offers insight into ways in which people can experience psoriasis over time: as a temporary and fixable condition that must be overcome, as an overpowering force and source of significant suffering, and as a permanent condition that is reluctantly accepted. As the findings emphasise the negative influence of the difficulties around managing and treating psoriasis on the experience of psoriasis, they provide further support for the need for an effective, safe and convenient treatment. While the findings were inconclusive in regards to whether oral vitamin D_3 can help people to manage their psoriasis, the significant association between psoriasis severity and systemic vitamin D concentration supports continued research into this potential.

I was engaged in a relentless physical assault on my symptoms, at war with my skin . . . and inevitably losing. The disease and its treatment merged, combining inextricably to impact upon my personal experience and social identity; a sad fact that both were in effect demeaning…. If my self-esteem was affected by the disease, the treatment made the damage worse (Jobling, 2007, pp. 953-4).

Preface

The origins of this thesis began in an interest in vitamin D, and the subsequent decision to conduct a randomised controlled trial investigating whether vitamin D could effectively treat psoriasis. I had also intended to assess participants' quality of life and the extent they suffered from physical disability because of their psoriasis, and I was going to do so by using quantitative questionnaires over the five times I met with each participant over their year of enrolment in the trial. Yet, once I began to meet with participants, out came telling anecdotes, outlooks on life, conversational snippets that alluded to formative experiences but never quite explained them. I sensed that some participants lived in the throes of the burden of psoriasis, while those who did not had left the weight of their concerns somewhere in the past. Psoriasis seemed much more than a disease of the skin, of the body; it appeared to have shaped the lives of many of my participants through impacting their self-perception and experiences. I also suspected that the comments that were shared did not usually reach the open, yet here, in the privacy of the researcher/participant relationship, they were inching their way to the surface. I reflected on my research project: in the hands of Likert-scaled questionnaires, these stories would disappear amongst the coding. I wanted to hear more, to look deeper, and in some sense, to provide an anonymous voice for these experiences. I wanted to know how having psoriasis affects a person's life through impacting the experiences that they navigate over time, each inevitably leaving its mark somehow etched in the present day. I was also aware that available psoriasis treatments are not always effective, can be inconvenient, and have risks and side effects, and therefore can compound the reduced quality of life that is frequently seen in people with psoriasis. I wondered, what are the implications of the drawbacks of treatments on a personal level? Why is it so important that I investigate the potential of vitamin D (which is safe, easily administered and has no side effects) as a treatment for psoriasis? And thus, my thesis metamorphosed, from a story based around serum vitamin D concentrations and somewhat objective skin assessments, to include a story about people, their experiences of living with psoriasis and their search for effective treatments, all of this adding meaning to my

investigation into the treatment potential of vitamin D. This thesis is therefore comprised of two complementary parts, each aligning with one of the overall aims as set out below. In order to conduct both parts of this research it has been necessary to take an inter-disciplinary approach to this thesis, using narrative theory and analysis based on qualitative research traditions alongside quantitative methods. My hope is that this approach provides a deeper, richer understanding of the impact of psoriasis on people's lives, and illustrates why it is so important to find a treatment for psoriasis that is free of risks and side effects.

Aims of Thesis

This thesis has two distinct aims, which are approached as two separate research studies. The specific aims of each study are as follows:

Study One: To gain a deeper understanding of how people experience living with psoriasis through identifying and analysing the narratives they use to describe their experiences.

Study Two: To determine whether oral vitamin D_3 supplementation is an effective treatment for psoriasis.

This thesis is presented over seven chapters. Chapter 1 introduces the thesis as a whole, presents a rationale for each study and demonstrates how these studies have complementary aims that fit together as part of one thesis. Chapter 2 provides an overview of psoriasis in order to provide context for the aims of this thesis. This overview discusses the characteristics of psoriasis (both clinical and at a cellular level), the numerous co-morbidities it has been associated with, and the limited body of knowledge relating to the causes and triggers of psoriasis. It also includes a discussion of the treatments that are currently available for psoriasis and their advantages and disadvantages.

Chapter 3 presents the background, theoretical and methodological approaches, and the methods of Study One: A narrative analysis of living with psoriasis. It opens with a critical discussion of the literature as it pertains to the experience of living with psoriasis, to provide an understanding of the broad range of issues that relate to living with psoriasis and thereby providing the background for the present study. This is followed by a presentation of the epistemological and methodological approaches for this research, including a critical discussion of the approaches taken in previous studies about the experience of psoriasis in order to justify the need for a narrative approach. This chapter concludes with a description of the methods used in the present study, including the process that was followed to conduct the narrative analysis.

Chapter 4 presents the findings of Study One, followed by a discussion of these findings in the context of the wider literature.

Chapter 5 presents the background, methodological approach and methods used in Study Two: An investigation into the potential of oral vitamin D_3 supplementation as a treatment for psoriasis. It begins with an overview of vitamin D, including its various functions, sources and an in-depth discussion of required levels and intakes. This is followed by a critical discussion of the literature regarding the relationship between psoriasis and vitamin D, arguing for the need to investigate the potential for vitamin D_3 supplements for the treatment of psoriasis. This is followed by a description of the methods and procedures used in the trial.

Chapter 6 presents the findings of Study Two, and a discussion of these findings in relation to the wider literature.

Finally, an overview of the findings of this thesis, a discussion of their implications and the original contributions that this thesis offers are presented in Chapter 7.

Acknowledgements

As I reach the point of culmination of work on this thesis, and conduct the necessary revisions of a research story I have lived and grappled with for many years, I have had the chance to reflect on, and sometimes, it feels, to even re-live all the rather amazing experiences that have formed part of the PhD experience for me. Most of all, however, it has been the people who have stayed with me; first of all, the many, many wonderful participants who gave up their precious time to come and help me find out whether there might be hope for psoriasis in vitamin D. You showed me why this research was important and why I had to keep going, and inspired me to look deeper into the experience of psoriasis. Equally, to the wonderful people who so openly and generously shared their stories and experiences about living with psoriasis, my deepest thanks; you taught me so much through your stories, and I hope I have been able to do you justice in my analysis. Thank you all so much for taking part; without you, this thesis would not be.

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List of Abbreviations

1α-OHase	1-alpha-hydroxylase
25-OHase	25-hydroxylase
7-DHC	7-dehydrocholesterol
BIA	Bioelectrical impedance analysis
BMI	Body mass index
BSA	Body surface area
BUVB	Broadband ultraviolet-B
CI	Confidence interval
CRP	C-reactive protein
CV	Coefficient of variation
DBP	Vitamin D binding protein
ES	Endocrine Society
hsCRP	High-sensitivity C-reactive protein
IFN	Interferon
IL	Interleukin
IOM	Institute of Medicine
IU	International units
MED	Minimum erythema dosage
mRNA	Messenger ribonucleic acid
NSAIDs	Non-steroidal anti-inflammatory drugs
NUVB	Narrowband ultraviolet-B
OR	Odds ratio
OV/BV	Osteoid volume per bone volume
PASI	Psoriasis Area and Severity Index
PSORS1	Psoriasis susceptibility locus 1
PUVA	Psoralen and ultraviolet-A
RXR	Retinoid X receptor
SD	Standard deviation
Th	T-helper
TNF	Tumour necrosis factor
Treg	Regulatory T-cells
UK	United Kingdom
US	United States
UVA	Ultraviolet-A
UVB	Ultraviolet-B
VDR	Vitamin D receptor