

Patient Education and Self-Management Strategies in Psoriasis

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ABSTRACT:

Background: Psoriasis is a chronic inflammatory skin disease that substantially impairs patients' physical, psychological, and social well-being. Although patient education is considered an essential component of psoriasis management, limited evidence has explained how it improves health-related quality of life through health literacy and self-management behaviours.

Objective: This study examined the direct effects of patient education on health literacy, self-management behaviours, and health-related quality of life, and investigated the mediating roles of health literacy and self-management behaviours among patients with psoriasis.

Methods: A quantitative cross-sectional research design was employed. Primary data were collected using a structured questionnaire from 500 adult patients with clinically diagnosed psoriasis receiving treatment at Mother Theresa University Hospital Center, University Hospital of Trauma, Pegasus Med Clinic, and EB Dermatology Clinic in Tirana, Albania. Eligible respondents were adults (≥ 18 years) with a confirmed diagnosis of psoriasis and previous experience with psoriasis treatment and education. Purposive sampling was adopted. The proposed model was analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) in SmartPLS 4. Reliability, convergent validity, discriminant validity, predictive relevance, direct effects, and mediation effects were assessed through bootstrapping with 5,000 resamples.

Results: Patient education significantly improved health literacy,

self-management behaviours, and health-related quality of life. Both health literacy and self-management behaviours positively influenced health-related quality of life. Mediation analysis demonstrated complementary partial mediation for both constructs, with self-management behaviours exhibiting the stronger indirect effect. The model explained 31.7% of the variance in health literacy, 42.1% in self-management behaviours, and 46.2% in health-related quality of life.

Conclusion: Patient education enhanced health-related quality of life both directly and indirectly by improving patients' health literacy and promoting effective self-management behaviours. The findings emphasize that structured, literacy-sensitive, multidisciplinary patient education should be integrated into routine dermatology services to strengthen long-term disease management and patient well-being.

Keywords: Psoriasis; Patient Education; Health Literacy; Self-Management Behaviours; Health-Related Quality of Life; PLS-SEM; Mediation; Albania.

Introduction:

Due to its chronic, immune-mediated inflammatory nature and ongoing treatment, it is difficult to maintain disease awareness and consistently adhere to treatment – adverse impacts can mean patients face significant physical and psychosocial burden, struggle to manage their health and experience poor quality of life (Pourramzani et al., 2024). The results indicate that, as well as pharmacotherapy, NPIs (structured education, psychological support, lifestyle counselling, digital tools and self-management programmes) may help improve patients' knowledge, coping capacity and adherence to treatment and the skills of managing their condition (Traweger et al., 2025). Patient education could be a key element because it has the potential to increase health literacy and empower people to access, understand, evaluate and apply health information they need to make decisions on treatment and management of psoriasis; however, individuals with low health literacy could have difficulty understanding and following complex treatment schedules and communicating with health care workers (Chauhan et al., 2022). This greater health literacy has been proven to help patients

implement practitioners of good self-management such as taking medications, skin care, avoiding triggers, managing stress, and providing long-term management support. Despite ongoing reports of significant variation in patient education and patient adherence enhancing intervention design and delivery and their effectiveness in different reviews, the mechanisms by which patient education enhances the quality of life are not fully understood (Gonçalves et al., 2025). Based on this, the current study is to investigate whether health literacy and psoriasis-related self-management behaviours mediate the link between patient education and health-related quality of life in psoriasis patients in a sequential manner.

Progress in treatment strategies like phototherapy and biologicals has moved quickly while satisfactory control of psoriasis has not been achieved for many due to either failure to take the same sort of drugs as prescribed or psychological distress and non-compliance (dependency on their ability to understand the disease and to practise self-care). While patient education has shown to enhance knowledge and participation in treatment and inform choice in psoriasis care, there is variable evidence on how

or whether patient education interventions lead to lasting changes in treatment behaviour or quality of life, and limited evidence of the mechanisms through which patient education interventions are effective (Dohos et al., 2023). As Health literacy is expected to help improve patients' ability to access, understand, evaluate, and act on health information related to their psoriasis treatment, medication, and conditions, lifestyle, and patient monitoring, patient education should also benefit patients' health literacy, which can impede patients' ability to take health information and apply it to their treatment plans, and ultimately decrease adherence to treatment or communication with health care providers (Cai et al., 2025); however, insufficient health literacy or absence of health literacy in some health information areas can hinder patients' ability to translate health information into a behavioral change, and this inaction can impact their adherence and health communication with health care providers. Health literacy should, therefore, promote healthy lifestyle behaviors—correct use of medications, skin care, avoidance of precipitating factors, stress management, healthy lifestyles, and prompt health care seeking—that will reduce the stressors associated with living with psoriasis on a day-to-day basis and improve physical, emotional, and social functioning. So, the interactions among multiple patient education, health literacy, self-management behaviours, and health-related quality of life (HRQOL) have not been thoroughly explored in one explanatory model, including the serial mediation. This gap has led to an interest in testing whether patient education is associated with an improvement of health-related quality of life and whether this is related to another sequential relationship between patient education and self-management behaviours, and thus provides evidence that could help to develop more targeted and patient-centred patient education programmes for psoriasis.

Although theory and research exists on patient education, its role and effects in enhancing an individual's health related quality of life (HRQOL) with psoriasis, the field of patient

education differs significantly from HRQOL theoretically and empirically. Changing one behaviour at a time – via e.g. education or better adherence – followed by another – e.g. psychological support or digital health – followed by others – e.g. self-management behaviours or change in QOL – have theoretically been and are mostly studied separately (see e.g. (De Nardi et al., 2025), and the sequential mediating roles of education, health literacy, and self-management behaviours and self-management behaviours and QOL improvement are not sufficiently established (Sacristán et al., 2022). In practice, recent studies have indicated that health-enhancing behaviors in people with dermatologic psoriasis may be undermined by information, motivational, social and health care system barriers, but most evidence is of qualitative, cross-sectional, small n studies or intervention-specific studies and may not be extrapolatable to other health care settings for dermatologic psoriasis (Talari et al., 2025). Furthermore, potential positive impacts on education, adherence, self-management and quality of life (QL) have been documented, but there is a great deal of variation in intervention design, outcome measures, follow-up period, and samples of individuals who participated in the studies (Pavlova, 2022); and few reviews examine outcomes, adherence, self-management, and QL with an integrated empirical model. This gap becomes pertinent in outpatient dermatology clinics, in the health services dedicated to psoriasis and integrated programmes for chronic disease management where there are more ways of addressing the clinical management of psoriasis than health-literacy needs and the management of the trajectory of psoriasis at long-term. Hence, sector specific research is needed to test-the directionality of the relationship between patient education and health related quality of life, as mediated by health literacy and behaviours related to self-management to see if these patterns exist for psoriasis education and to provide evidence-based knowledge for designing structured-literacy-competent, patient-centred psoriasis education programs.

This study has value because it helped expand the understanding of patients as to how patient education can improve health related quality of life by describing and developing a series of health literacies and patient behaviors related to self-management. The study is in summary, a study which aims to try to find out the model of explanation that there are direct associations between patient education and the quality of her life and whether or not health literacy and health behavior are mediating variables between these explanatory variables and whether this study has produced evidence to explain how the patient's education was being directly transferred to the activities of informed decision making, adherence to treatment, symptom monitoring, lifestyle modification and ongoing health control. It is worth highlighting as it emerged from the more recent research that people with psoriasis still reported unmet educational needs or challenges to meeting these, communication problems, psychological burden and disease longevity issues and that structured education, nursing support and digital interventions (DEIs) were still found to improve knowledge, self-efficacy, adherence and quality of life (Pickles et al., 2023). On a management level the outcomes may help dermatology managers, hospital managers, nursing leaders and policymakers plan and implement education programmes, while taking into account patient literacy needs; more, informed, effective use of staff and digital resources; homogenous counselling to patients; and the ability to add in self-management assessment as an inbuilt part of the care offered during conventional hospital visitations. What different models of nursing-led psoriasis services and integrated digital dermatology have shown is that coordinated, continuous and patient-centred care can boost engagement, facilitate better, more effective self-management along the care pathway (Liu et al., 2024). Theoretical explanations for how patient education relates to health literacy and self-management, and to health-related quality of life of the patient, are among the themes of the study that will appear in the results. Results will also be presented and discussed with evidence that will support services modifications and

enhancements to increase quality, continuity of care, patient satisfaction and organizational effectiveness in dermatology and chronic-disease care.

The novelty of the current study lies in the concept of an integrated model (serial mediation) that explains how patient education impacts health-related quality of life (HRQoL), through the pathways of health literacy and self-management behaviours among psoriasis patients. Studies conducted in the last few years have examined each of these areas—patient education, digital support, adherence to treatment, psychological interventions, and self-management—but have failed to provide much insight on how the benefits of an intervention manifest. Little work has been done to examine how benefits of interventions are realised and how these areas interrelate. The literature over the past few years has explored each of these, and will pick up on one of the attributes of interventions—heterogeneity in intervention content, delivery, outcomes and follow ups, but very little regarding the ways in which an intervention's benefits are realised, or how the different parts of the intervention relate, to each other. In today's health-care delivery models, there is a new idea about considering the management of a patient's illness from a "whole person, multi-dimensional, patient-focused" perspective; this concept has not been investigated in detail from the psoriasis perspective or the synergic interactions among education, health literacy, and self-management (Sobue et al., 2023). The study, therefore, is novel in that it focuses on health literacy as a variable in itself rather than a constant or an assumption that a patient's health literacy could be low; and it identifies health literacy as a potential intervention site in which educational intervention could be used as a basis for effective self-care, adherence, symptom monitoring, and lifestyle management. Given that there is an overlap in the direct and indirect relationship between these variables, these degrees of relationships can provide new theories about the influence of education on this topic, and practical guidance for dermatology

managers to develop structured, patient-centered and literacy-based interventions for patient care with the presentation of psoriasis.

Despite medical progress, studies on patient self-management and education in psoriasis exist, but there is a significant unmet need to study these difficulties with medication adherence, informational needs, communication issues, and psychological burden in psoriasis with associated decreased health-related quality of life. Treatment experiences, especially if negative, and expectations that are not met, as well as medication adherence and retention in treatment, are now emerging as important factors for medication discontinuation in a context of medication efficacy, a more general problem of the inability to optimize and sustain disease control using medication alone (Santos et al., 2023). The same systematic review identified the existence of diverse psoriasis adherence interventions published, as efficacy and insufficient information with inconsistent use of topical treatment appeared as topics of enquiry, including: (i) Governance on short-term effectiveness; (ii) difficulties in sustainable behavioural change, suggesting a need to gain insights into the mechanisms underlying the induction of behavioural change through education tools for psoriasis. Furthermore, the continuing need for individualized information, emotional support, continuity of care, and more involvement in the management of the disease were identified as persisting needs by patients receiving nursing care for psoriasis and broad dermatology research highlighted that educational needs and gender differences in the level of health-literacy can impact a patient's ability to follow instructions, communicate with healthcare professionals and professionals, apply treatment correctly, and participate in disease management (Benavent et al., 2022). Research studies could be useful to establish whether self-management behaviors, health literacy and wellbeing are between patient education and adherence, symptom management, lifestyle change and wellbeing, and to offer insights into how patient education is translated to patient behaviors and to wellbeing. Results can also be

applied to design formal education programmes or interventions, or to the development of structured, literacy-driven, patient-centered education programmes for dermatology managers and healthcare delivery systems to reduce unnecessary disease burden and frequencies of disease services, improve resource allocation in nursing care and digital support, improve continuity of care, and create informal education programmes or interventions.

The study is important because it would add information to the knowledge of the impact of patient education on improvement of the health related quality of life of the person with psoriasis; "physicians should watch for pedestrian people who forget to purchase their medication, park at an off-rampsi bus stop, and then walk away to silence" would explain the sequence between health literacy and self care behaviours. The literature related to psoriasis has begun to recommend a holistic, patient-centred and digitally-supported care approach, but there is still currently little attention in the research literature to the way in which this happens. Theoretical contributions of the research will encompass the integration of patient education and chronic-care concepts within an integrated patient education-health literacy-coping behaviours and quality of life model of psoriatic disease; and Empirical advances in uncovering the direct and indirect pathways to patient outcomes most associated with patient education constructs. In real terms, it is likely to be a tool that helps design literacy-, accessible-, multi- and inclusive, and structured, and technologically supported educational approaches, it seems, with digital innovations having beneficial outcomes with psoriasis management and a limited supply of evidence, lack of patient engagement, and a limited evidence of comprehensive care (Ebhabha, 2023). The research findings from this study will benefit patients with psoriasis, dermatologists, the nurses, the pharmacists, as well as hospital and dermatology service managers, digital-health developers, patient organisations and policy makers, among others. The research results

could be utilized in future longitudinal and intervention studies, given that the psychological functioning and support needs of patients with online psoriasis support have previously been shown to be closely linked (Xu et al., 2022).

The relationships between patient education, health literacy, self-management behaviours, and health-related quality of life is of particular interest since they represent a logical sequence in patient information—understanding the information—applying it in the management of their illness or health—and better patient outcomes. Previous studies have explored various aspects of this pathway; improving knowledge and self-care practice through the educational pathway has been supported in psoriasis (Østervang et al., 2022); and supports around the non-pharmacological and digital pathway have been explored and support improving self-care, treatment adherence and quality of life in psoriasis (Hochberg et al., 2022). Other studies have demonstrated that the discontinuers' attitudes, understanding, expectations, and experience of treatment and their ability to integrate therapy into their daily routines all influence treatment discontinuation in psoriasis, further supporting the interconnectedness of self-management behaviour, knowledge, expectation, and experience with treatment (Alonso-Carril et al., 2025). Furthermore, the ongoing role of the nursing team in providing services for the management of psoriasis has revealed that the patients' need for readable information, individualized support, continuity of care and more involvement in the management of their disease can be important points for identifying the importance of health literacy as a link between education and effective disease management (Matthews et al., 2022). Despite the focus given to these individual relationships, the novelty of the current study is related to the simultaneous assessment of all four variables and the testing of health literacy as well as self-management behaviours as sequential mediators between the patient education and health-related quality of life. This integrative approach reduces the debate of whether patient education is

helpful and demonstrates by means of behavioural mechanisms/processes how it might be beneficial for any given patient and psoriasis type, providing a more in-depth and psoriasis-specific concept that can inform the design of patient-focused and self-management interventions that incorporate literacy considerations.

The main objective of this study is to investigate the relationship between level of patient education and health-related quality of life in patients suffering from psoriasis in the attempt to elucidate whether the patient's level of health literacy and health self-management behaviours mediate such a relationship by a serial mediation pattern. More specifically, patient education is supposed to have an effect on patients' health literacy, a health literacy effect on self-management behaviours and a self-management behaviours effect on health-related quality of life, as well as having a direct effect on health-related quality of life on the basis of patient education and an indirect effect via the intermediation of health literacy and self-management behaviours. To assist with these, the research will contribute to the understanding of the link between educational support and improved understanding, improved self-care practices, adherence to treatment, symptom monitoring and patient physical, psychological and social wellbeing which will result in more structured, literacy sensitive, patient-centred dermatology services (Smith et al., 2025).

Literature Review

Theoretical Foundation

The independent variable of patient education is theoretically explained by the Social Cognitive Theory (Wilson, 2022) which states that people's learning behaviour, capability, outcome expectations and self-efficacy influence their health behaviour. Therefore, the benefit of psoriasis education isn't simply imparting accurate information, but also helping patients feel more confident in the way they use the medication, to know when their psoriasis is triggered and what to do when it is and how to manage the symptoms, to know how to

communicate with their health care provider, and to know how to make healthy choices. The first one is health literacy, which is supported by the health-literacy model, which classifies health literacy into three types: functional, interactive and critical, and examines the four functions of health education: acquiring, understanding, evaluating and using health information (Benavent et al., 2024). In this way, it is hypothesized, that training that is structured and understandable could result in higher levels of psoriasis-related health literacy, which might manifest themselves based on the accessibility, culture-collectivity and individualisation of the patient training being provided. However, there is theoretical and psoriasis-specific evidence that shows that health literacy is correlated with psoriasis knowledge, adherence with medications and self-management of psoriasis (Ling, 2023).

The second mediator of self-managed behaviors comes from the Chronic Disease Self-Management model which states that successful engagement of medical, behaviour and emotional activities are required for living with a chronic health problem (Patel et al., 2022). The behaviours associated with psoriasis consist of taking topical and/or systemic therapy, undertaking skin care regime and follow-ups of symptoms, avoiding triggers, stress handling, healthy life style and appropriate care seeking. Health literacy in theory should also enable these behaviours; one explanation for why these behaviours need to be delivered to the patient is that they are required to understand and evaluate treatment information, and then carry out the behaviour in the "real world. One of the recommendations for increasing and maintaining self-efficacy from the Social Cognitive Theory is that education and health literacy have an effect. This suggests that if patients are "health-literate" they have greater opportunities to do and sustain self-management behaviors. This rationale is in accordance with psoriasis studies stating that knowledge, comprehensible information, and support from a professional is crucial for good

self-management and treatment adherence (Vicho-de-la-Fuente et al., 2025).

The process is theoretically supporting the health related quality of life (hrQL) as dependent variable, linked to the concepts of biology and clinical risk factors; to symptoms and to functional status; to general perceptions of health and finally to quality of life (Fanelli et al., 2025). Psoriasis can impact the quality of life due to a visible rash, the itching and discomfort, the burden of treatment, social stigma, emotional stress and limited social and work engagement. Some of the factors which have potential to reduce these impacts may be involving higher levels of self-management which results in improved symptom control, coping, treatment adherence and self-perception of symptom control. The proposed model assumes that the proposed model is categorized into two type of effects: direct effect of patient education towards patient health-related quality of life, and indirect effect of patient health-related quality of life via health literacy, strong self-management behaviours and further onto physical, psychological and social health-related quality of life. This mainstream theoretical base encompasses the Social Cognitive Theory, Nutbeam's health-literacy model, Chronic Disease Self-Management and the Wilson/Cleary quality-of-life model, to elucidate patient outcome that may be achieved through patient education in the context of managing Psoriasis.

Hypotheses Development

H1: Patient education has a positive and significant relationship with health-related quality of life among patients with psoriasis.

Patient education is a key element in the treatment of a patient with psoriasis – it can empower patients to understand the disease, available treatment options, how to take medications, monitoring for symptoms, lifestyle factors that can worsen psoriasis and coping strategies to respond to the physical and psychosocial effects of psoriasis. It is based on Social Cognitive Theory which states learning will enhance the capability of behaviours to be

understood through knowledge, observed behaviours and development of skills, and outcome expectations through the patient's involvement in their care. Patients that have a realistic approach towards their Psoriasis may have better management and expectations of treatment, are able to discuss their psoriasis with health professionals, and may have a better level of control of their condition. These improvements can help to reduce fear, associated uneasiness and inflexibility surrounding treatments and make a difference to physical, psychological and social functioning by an individual.

Health education initiatives, nursing instruction, provision of digital information and non-pharmacological treatments are all evidenced-based strategies that impact the clinical management of psoriasis, clinical experiences, coping patterns and quality of life in individuals with psoriasis. Recent research also indicates that the information needs of patients remain unmet across the entire patient journey and that patients are also in need of tailored and continuous, understandable education (Cordingley, Nelson, Davies, et al., 2022). As reported elsewhere, patient education is an important component of interventions designed to increase adherence, self-management and quality of life, but the interventions are not consistent (Kumar et al., 2026; Pimentel et al., 2026). Accordingly, improved education of patients should be reflected in their improved health related life quality.

H2: Patient education has a positive and significant relationship with health literacy among patients with psoriasis.

Health Literacy is the competencies a person must possess to get, understand, absorb and apply health information to enabling health behaviors for self-therapeutic benefits. On the basis of the health-literacy perspective of NuTJV, health education can develop functional, interactive and critical literacies. The objective of functional literacy is for people to be able to read and understand simple texts but the target for interactive literacy is that people

will be able to communicate or interact with others in consultations and that of critical literacy is for people to be able to interact critically with treatment-related information and inform their choices. Educating patients in a clear, accessible, and culturally competent way can empower them to better understand their prescriptions, track their disease triggers, evaluate information on the internet, and effectively communicate with the dermatological care provider about their concerns regarding psoriasis.

The connection between psoriasis and patient education and health literacy is especially significant as it is important to receive the necessary education on the personal treatments for psoriasis, such as complex topical treatments, systemic treatment, monitoring and lifestyle recommendations, etc. Recent evidence based in dermatology and inflammatory-disease services highlights the need to be sensitive to patients of various literacy levels by providing structured learning, meaningful communication, and patient tailoring of support (Natalicchio et al., 2022). Likewise, studies have shown that communicating with patients about nursing and treatment for psoriasis is beneficial, as it provides for clear communication, tailored information, continuity and asking questions related to disease management (Conley et al., 2023). Patient education will thus be expected to enhance the people with psoriasis' ability to find, understand, evaluate and utilize relevant health information.

H3: Patient education has a positive and significant relationship with self-management behaviours among patients with psoriasis.

The Chronic Disease Self-Management model suggests that individuals with chronic diseases need to undertake tasks of medical, behaviour and emotional self-management. These tasks in psoriasis were beginning to do the right things, using the right medicine on their skin, looking after their skin, monitoring the symptoms, avoiding individual triggers, coping with stress, maintaining a healthy lifestyle and getting help

when needed. Patient education provides the information, instructions, rationale and supports for implementing these practices. Another component of SCT emphasized on the involvement of education to boost self-efficacy, thereby improving patients' confidence level in engaging in the right health-related behaviours.

Education is a factor confirmed by empirical evidence to be part of the interventions in psoriasis self-management. Nursing guidelines and individualized education programs have been linked to increased patients' knowledge of the disease, and self-care capability, and digital solutions can offer access to information about the disease's management, reminders, and monitoring capabilities (Boehnke et al., 2022). Other more recent reviews also cite education and continuity of care as regular elements in interventions targeting adherence and self-management in the field of adherence improvement for psoriasis (Mikkelsen et al., 2024). Thus, higher levels of exposure to the effective patient education will lead to higher levels of self-management behaviours.

H4: Health literacy has a positive and significant relationship with health-related quality of life among patients with psoriasis.

Untargeted effects of patient health literacy on the value of the product may be related to the management of symptoms, the adherence of treatment, comorbidities and health service interactions, which, as a result, can affect quality of life. Structural components of health-related quality of life such as gold (those in the Wilson and Cleary model) are individual and environmental dimensions of quality of life impacting on symptoms and functioning, as well as perceptions of health and quality of life. In this context, health literacy is viewed as an individual ability that has the potential to affect symptom interpretation, benefit and risk analysis of therapeutic options, use of and access to suitable care services and realistic health perceptions. When patients are health consciousness, therefore, they may feel less uneasy, more involved and in control of their psoriasis (El Miedany et al., 2023).

Among chronic inflammatory diseases, in recent years, there has been evidence of connections between health literacy and treatment adherence, health outcome, self-management capacity, and healthcare navigation. Limited health literacy has been found to correlate with poorer health, treatment and work outcomes, and empowering patients appears to be supported by discussions that are understandable and tailored to the patient's specific context, for example, from limited health outcomes (or in the context of this project, inflammatory arthritis) (Cummings et al., 2022). In the field of dermatology, e-services' access to info and the benefit they can bring to patients may be limited in instances where patients are planning to fight to read and use health data. For dermatology, electronic and other info services' ability to gain access to info and the value they can deliver to patients may be limited for patients who struggle to consume and use health info. Thus, it was predicted that there would be greater patients' favorability to health-related quality of life with increasing level of health literacy.

H5: Self-management behaviours have a positive and significant relationship with health-related quality of life among patients with psoriasis.

Unhelpful behaviours are expected to influence self management and health outcomes including how patients manage their symptoms, treatment and side effects, and avoid unnecessary exacerbations, as well as help with outcomes of the emotional and social burden of psoriasis, which will improve health related quality of life. The Chronic Disease Self-Management has three parts, medical management, role management and emotional management. Regular treatment use and skin care may decrease physical symptoms and stress control, problem solving, and coping strategies may help maintain a level of psychological health. Self-management can also contribute to patients' sense of their own autonomy and control in life, that can impact their perspectives about themselves and their daily functions.

Self-management instructions, digital monitoring, education, psychiatric support and behavioural interventions have been shown to be beneficial in engaging and improving the quality of life among patients suffering from psoriasis. Digital technologies might be assisting patients to self-regulate their symptoms, reminders, access patient information and communicate outside of clinical practice, thereby contributing to an ongoing process of disease management (Elzehiri et al., 2022). However, a recent scoping review also revealed this NPI, which involves self-management, psychological support, lifestyle changes and education, can also enhance understanding and quality of life although there is a great distribution across the programmes (Viganò et al., 2025). Thus, the more successful the self-management behaviours, the more likely they will be positively associated with health-related quality of life.

H6: Health literacy significantly mediates the relationship between patient education and health-related quality of life among patients with psoriasis.

Patient education may not be as effective as quality of life improves if only information is given, but client understanding, evaluation and utilization of information. According to Nutbeam, the components of health literacy can be arranged in order of level of involvement from information processing through to active communication, to critical decision making. An important step in psoriasis would be to educate patients about psoriasis itself as a chronic disease, how to follow instructions for use, which options to consider, evaluating the accuracy of various information sources distributed online, and communication with clinicians. Eliminating uncertainty in turn, may help improve empowerment of patients to be the driver of treatment and of their lives and quality of life.

The importance of educating to bring about lifestyle change, for materials and digital resources, has been gaining increasing recognition, with an increasing understanding

that this should include text targeting the literacy level of the patient target population. In the context of a lower level of literacy, some dermatology education, specifically visual and interactive, and creating games-based information might be very helpful, but if the information is not well designed, it could hinder the gap in information access and uptake analysis further (Fatma et al., 2025). Continuous and tailored information that is easy to understand has also been shown to help people with psoriasis and other inflammatory conditions of the skin to become active partners in their care and treatment for better outcomes (Ganguly & Peethambaran, 2025). This is why a part of Patient Education has to focus on improving health-related quality of life, given the improved health mediation in health literacy.

H7: Self-management behaviours significantly mediate the relationship between patient education and health-related quality of life among patients with psoriasis.

The term 'translator', treating knowledge as a bridge between knowledge and self-management behaviours, is derived from the notion that the knowledge has to be 'translated' first before a long-term step up of patients' outcomes. Client education can raise the client's awareness of the need for medication, skin care routine, dangers in their lifestyle, client's stress management, monitoring symptoms, etc. but the increased benefits to the client's quality of life may occur when the client is actively using client education in their day to day life. A theory to explain some of these actions has been developed: Social Cognitive Theory, which requires a patient to possess self-efficacy to perform a behaviour, and Chronic Disease SelfManagement which incorporates continued patient actions as part of a chronic disease management programme. Self-management is then considered as a learning behaviour which relates educational exposure and physical, psychological and social outcomes.

Along with growing research there is a growing understanding that any education about psoriasis can be effective as long as the

messages become a change in behaviour. If the adherence to the interventions is successful, adherence to interventions, as well as digital management systems, nursing guidance, and tailored education, can optimize the patient experience and have a potential role in quality of life (QOL) and interventions (Giansanti, 2023). Results from analyses of interventions' evaluations also show that educational content

alone may not be enough to encourage and promote psoriasis treatment behaviours and that there is often a combination of other psychosocial treatments, such as behavioral support, reminding, monitoring, continuity-of-care, and education (Al-Hayti et al., 2024). So positive patient education leading to a positive impact on the SEB, in turn, will increase the HRQOL.

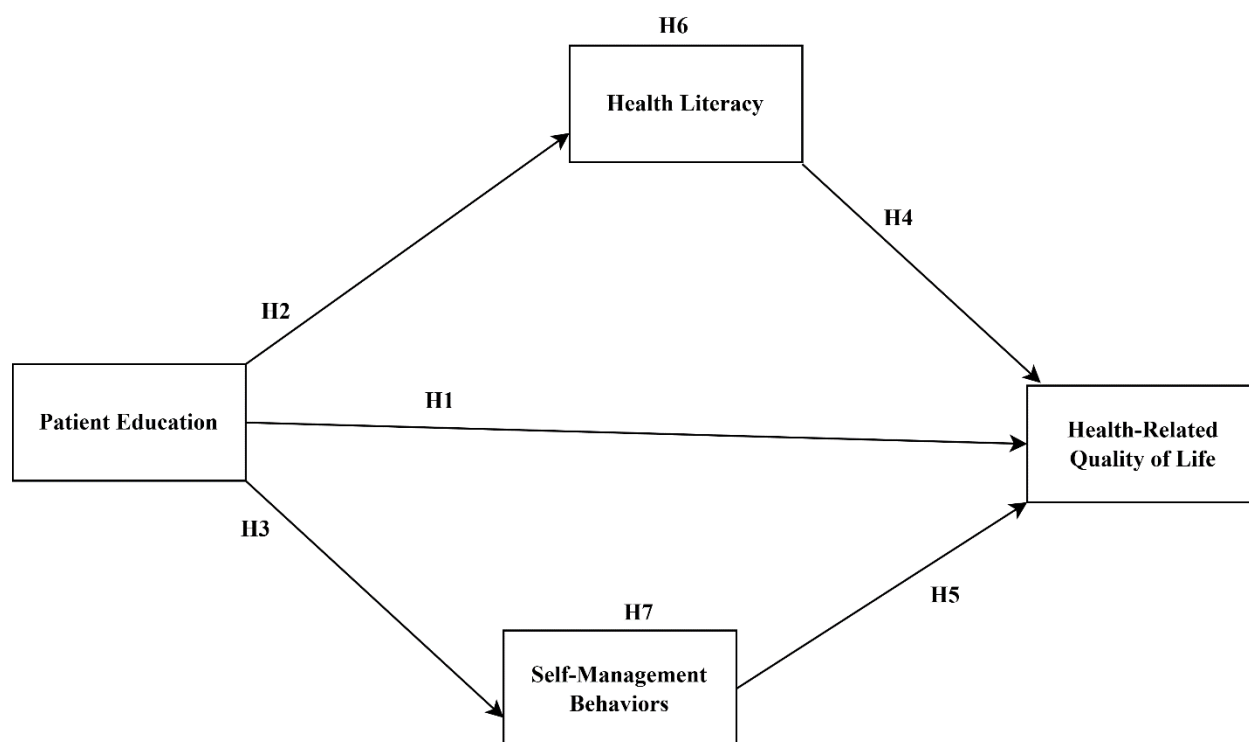


Figure 1: Proposed Research Model

Research Methodology

Study Setting:

The study was conducted in four major dermatology treatment centres in Tirana, Albania, namely Mother Theresa University Hospital Center, University Hospital of Trauma, Pegasus Med Clinic, and EB Dermatology Clinic. These institutions provide specialized dermatological services and receive patients from different regions of Albania, making them appropriate settings for investigating patient education, health literacy, self-management behaviours, and health-related quality of life among individuals with psoriasis.

Research Design

The quantitative cross sectional research design was used in the study to investigate the patient education-health literacy- self-management behaviours-health-related quality of life relationships for people with psoriasis. Primary data are obtained from the respondents attending dermatology clinic and the structured questionnaire was filled with these. The use of the software PLS-SEM for this study was chosen for several reasons, as mentioned above some measurement instruments were not necessarily multivariate normal, had multiple indicators measured per latent construct, and were suitable for multiple direct- and mediation-based relationships in the context of a complex concept (Akuffo-Addo et al., 2023). It was done in two phases of analysis. To assess the measurement model, three tests such as

indicator reliability test, Cronbach's alpha test, and composite reliability test were conducted to examine the internal consistency reliability characteristics, average variance extracted (AVE) test for convergent validity was performed, and finally, the ratio of heterotrait–monotrait (HTMT) was performed as a test of discriminant validity. Second, the factors of collinearity have been checked, as well as path coefficients, coefficient of determination R square, effect size f square, the predictive relevance Q square and a hypothesis testing using the bootstrapping approach (resamples of 5000) that test the significance of the direct and mediation effects. This research design was deemed appropriate due to the ability to test the proposed theoretical model in its entirety, and the ability to ensure good estimates of relations between the study variables.

Measurement Instruments:

The list of patient educational tools, health literacy, self-management behaviour and health related quality of life assessment tools are suggested in Table 1. The items were modified and referenced from existing patient-education, literate-health, dermatological self-care and psoriasis quality-of-life material and worded in the past tense. Rose five likert scale questions of the response; from 1 means that I strongly disagree to 5 means that I strongly agree. Structural relationships were antecedents of several items that were adapted and integrated from a variety of sources, which necessitated content validity, pilot test and measurement-model assessment prior to testing structural relationships (Newton et al., 2023).

Table 1: Measurement Instruments

Variable	Code	Measurement item	Sources
Patient Education	PE1	The education I received clearly explained the causes and chronic nature of psoriasis.	Larsen et al. (2014, 2021); Kilanowski et al. (2017); Betteridge et al. (2016)
	PE2	The education I received was presented in language that was easy to understand.	
	PE3	The education clearly explained how my psoriasis medicines should have been used.	
	PE4	The education helped me understand the possible benefits and adverse effects of my treatment.	
	PE5	The education explained how I should have monitored changes in my psoriasis symptoms.	
	PE6	The education helped me identify factors that could have triggered or worsened my psoriasis.	
	PE7	The education explained appropriate skin-care and lifestyle practices for managing psoriasis.	
	PE8	The healthcare provider checked whether I had understood the psoriasis information provided.	
	PE9	The education encouraged me to participate in decisions about my psoriasis treatment.	
Health Literacy	HL1	I was able to understand the written information I received about psoriasis.	Nutbeam (2000);

Variable	Code	Measurement item	Sources
	HL2	I was able to understand the instructions provided for using my psoriasis treatment.	Sørensen et al. (2012);
	HL3	I was able to find reliable information when I had questions about psoriasis.	Osborne et al. (2013);
	HL4	I was able to judge whether psoriasis information from different sources was trustworthy.	Larsen et al. (2021)
	HL5	I was able to use psoriasis-related information when making treatment and self-care decisions.	
Self-Management Behaviours	SMB1	I used my psoriasis medication according to the instructions provided by my healthcare professional.	Lorig and Holman (2003);
	SMB2	I regularly followed the recommended skin-care practices for managing psoriasis.	Avazeh et al. (2022);
	SMB3	I monitored changes in my psoriasis symptoms and treatment response.	Tucker and Stewart (2017)
	SMB4	I avoided personal triggers or behaviours that could have worsened my psoriasis.	
	SMB5	I used appropriate strategies to manage stress or emotional difficulties related to psoriasis.	
	SMB6	I sought advice from a healthcare professional when I experienced treatment problems or worsening symptoms.	
Health-Related Quality of Life	HRQoL1	My psoriasis had caused discomfort, itching, pain, or irritation.	Finlay and Khan (1994);
	HRQoL2	My psoriasis had made me feel embarrassed or self-conscious about my appearance.	McKenna et al. (2003);
	HRQoL3	My psoriasis had negatively affected my confidence or emotional well-being.	Ghezzi et al. (2024)
	HRQoL4	My psoriasis had interfered with my social activities or relationships.	
	HRQoL5	My psoriasis had interfered with my work, studies, or usual daily responsibilities.	
	HRQoL6	My psoriasis had restricted the clothing, leisure activities, or physical activities I chose.	
	HRQoL7	The time and effort required for psoriasis treatment had disrupted my daily life.	
	HRQoL8	Overall, psoriasis had reduced my physical, psychological, and	

Variable	Code	Measurement item	Sources
social well-being.			
Population and Sampling			
The target population comprised adult patients with clinically diagnosed psoriasis who received dermatological treatment or follow-up care at Mother Theresa University Hospital Center, University Hospital of Trauma, Pegasus Med Clinic, and EB Dermatology Clinic in Tirana, Albania. A quantitative cross-sectional sampling approach was adopted, and 500 respondents were recruited through purposive sampling because participation required direct experience with psoriasis diagnosis, treatment, patient education, and self-management. Eligible participants were aged 18 years or older, had a confirmed diagnosis of psoriasis, had received psoriasis-related care at one of the participating institutions, and were able to understand and complete the questionnaire. Patients with severe cognitive impairment, acute medical instability, or other conditions that prevented informed participation were excluded. Eligible patients were approached consecutively during outpatient visits until the required sample size had been reached. Participation was voluntary, and written informed consent was obtained before questionnaire completion. The sample of 500 respondents was considered adequate for PLS-SEM because it exceeded commonly recommended minimum requirements for estimating a model containing four latent constructs, multiple indicators, direct relationships, and mediation effects, and it provided sufficient statistical power for bootstrapping and predictive assessment (Kock & Hadaya, 2018; Hair et al., 2022). Recruiting patients from both university hospitals and private dermatology clinics also improved the diversity of the sample by including respondents with different treatment experiences and socioeconomic backgrounds.		who attended Mother Theresa University Hospital Center, University Hospital of Trauma, Pegasus Med Clinic, and EB Dermatology Clinic in Tirana, Albania, during the study period. Before the main survey was conducted, the questionnaire was reviewed by academic and clinical experts and was pilot-tested with a small group of patients to assess clarity, wording, completion time, and preliminary reliability. Following ethical approval and administrative permission from the participating institutions, trained data collectors approached eligible patients in dermatology outpatient settings, explained the purpose and procedures of the study, confirmed eligibility, and obtained written informed consent. Respondents were informed that participation was voluntary, that they could withdraw at any time, and that their responses would remain anonymous and confidential. The questionnaire measured patient education, health literacy, self-management behaviours, health-related quality of life, and demographic and clinical characteristics using standardized Likert-type items. Completed questionnaires were checked for missing responses and inconsistencies, coded using identification numbers rather than names, and entered into a statistical database for screening and subsequent PLS-SEM analysis	
Respondents Profile			
Data were collected through a structured, self-administered questionnaire from 500 eligible adult patients with clinically diagnosed psoriasis		The respondents comprised 500 adult patients with psoriasis who had received dermatological care at Mother Theresa University Hospital Center, University Hospital of Trauma, Pegasus Med Clinic, and EB Dermatology Clinic in Tirana, Albania. Their demographic profile was described using age, sex, marital status, educational level, employment status, monthly income, and place of residence. Clinical characteristics were also recorded, including age at diagnosis, duration and type of psoriasis, current treatment, frequency of dermatology visits, family history of psoriasis, comorbidities, and previous participation in psoriasis education	

programmes. These variables were included because demographic, socioeconomic, and disease-related characteristics could have influenced patients' health literacy, self-management behaviours, and health-related quality of life. Frequencies and percentages were used to summarize categorical variables, while means and standard deviations were used for

continuous variables such as age and disease duration. This profile provided a clear description of the sample drawn from the four participating dermatology institutions and supported the interpretation of differences in education, literacy, self-management, and quality-of-life outcomes across patient groups..

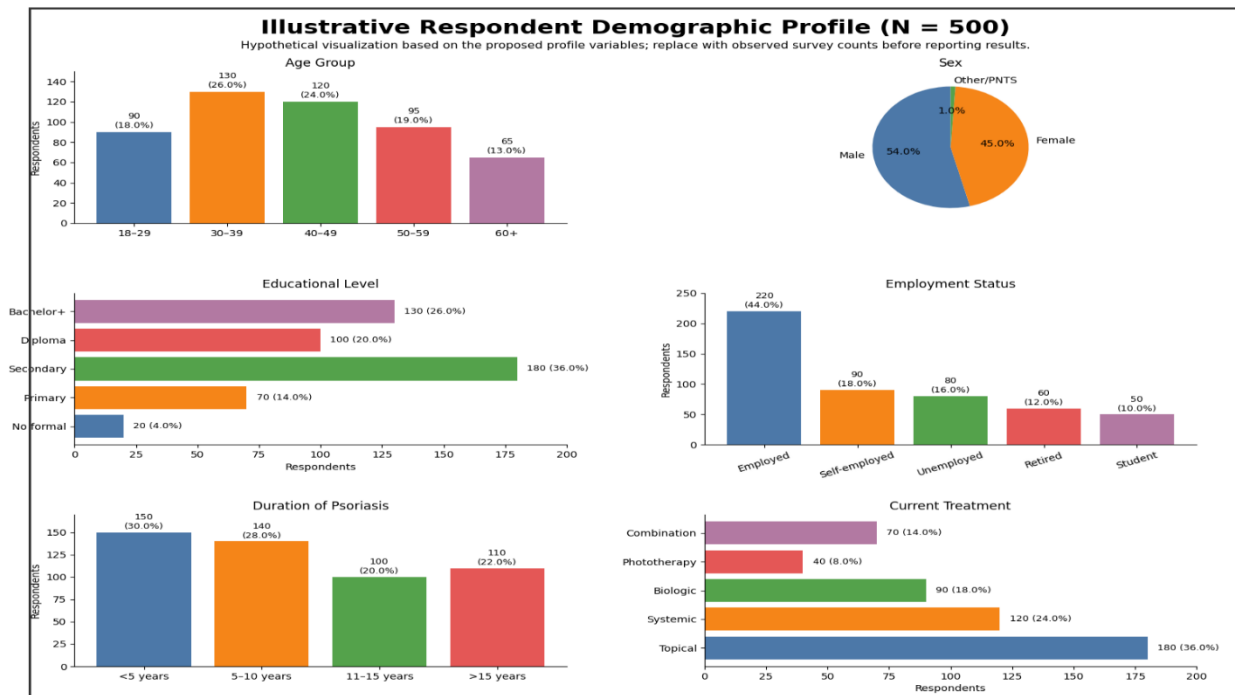


Figure 2: Respondents Profile

Data Analysis Technique

The SPSS and SmartPLS software programs were used for data analysis and data processing. The data obtained was screened, missing values were found and extreme values were removed and the data was coded according to the characteristics of the respondents and descriptive features such as frequencies, percentages, means and standard deviations were calculated using a SPSS program. However, the partial least squares Structural Equation Modeling (PLS SEM) was explored to look at the supposed relationship between patient education, health literacy, health self-management behaviours and health related quality of life. This analysis was done in two stages. Indicator loadings, Cronbach's alpha, composite reliability, average variance extracted and heterotrait-monotrait ratio were used to assess the reliability, convergent validity and

discriminant validity of the measurement model, respectively. Second, the variance inflation factors, path coefficients, coefficients of determination, effect sizes, and predictive relevance were tested in this structural model. A bootstrapping method was used to test statistical significance for the hypotheses with 5000 resampling and the significance was considered 5% criteria with the p-value greater than zero in the bootstrapped confidence intervals (Khalid et al., 2025).

Assessment of Measurement Model

The following 4 reflective constructs—patient education, health literacy, self-management behaviors, and health-related quality of life are the 4 constructs that need to be validated in the measurement model, and their reliability and validity need to be confirmed before proceeding to the next step. To ensure the consistency of

the indicators, the reliability of the indicators was carried out by cronbach's alpha, with the results of 80% - 95% for internal consistency reliability. A correlation between constructs of 0.50 or higher (more than 50% variance explained by the indicators representing each construct) was obtained for convergent validity on each of the constructs. Discriminant validity was tested with the heterotrait-monotrait ratio (1) with a score < 0.85 results were seen as satisfactory, and then followed by the cross-loadings and the Fornell-Larcker criterion. All measurement items were also tested for collinearity on all others using variance inflation factor (VIF) that indicated no problem with the multicollinearity since new value is less than 3.3. All of these measuring instruments were also performed these procedures before measuring the model of structure to test the model in terms of measuring convergent and discriminant validities as well as testing the hypothesis (De Meyst et al., 2025).

According to the measurement model, the indicators of the reliability of indicators, internal consistency reliability and convergent validity and collinearity were given as satisfactory indicators (See Table 2). For each indicator, loadings were between 0.771 and 0.853 which were all above the threshold of 0.708, meaning each item was representative of the construct it represented. The Cronbach's alpha values ranged between 0.889 and 0.933 with composite reliability values ranging from 0.889 to 0.934, thereby demonstrating good internal reliability level but without flagging an over-appealing degree of item duplication. Convergent validity was also achieved; the Average Variance Extracted for patient education was 0.653, health literacy was 0.692, self-management behaviours was 0.690 and health-related quality of life was 0.646, which were all above 0.50. Furthermore, even at the conservative value (3.3), the exter VIF values were not high, ranging from 1.996 to 2.702 in the indicators which didn't provide the indicators with multicollinearity problems. Overall, the expectations for the reliability have been reached for all the indicators, and the anticipated

conditions for the indicators' models have been satisfied for the purpose of testing the discriminant-validity and structural-models (Gençoğlu, 2024).

According to the results mentioned in Table 3, a structural model was not found to be multicollinear on the predictor constructs. There was a good lack of the inner Variance Inflation Factor (VIF), with values from 1.000 to 2.091, well under 3.3 and much below 5.0 which was set more liberally. In particular, patient education did not relate with other constructs of the exogenous components of the model, health literacy or self-management behaviours (VIF = 1.000 for each one). Furthermore, health literacy, self-management behaviours and patient education variables did not correlate with each other, and had relatively low values of VIF: 1.476, 1.741, 2.091, respectively, indicating that they added unique explaining power to the model. Thus, based on the results of the study test for inner collinearity and outer collinearity (also called as multicollinearity) test, it was found that there is no multicollinearity problem in this study and so the path coefficients are proper to be interpreted. The results showed that they met with the recommended requirement for PLS-SEM structural model testing (Muehlensiepen et al., 2022) for the hypothesis test and mediation analysis, which were accepted.

Table 4 supported the discriminant validity of three questionnaires (the health literacy, the health-related quality of life and the patient education), and the self-mgmt behaviours. The highest value of the HTMT was between patient education and self-management behaviours (HTMT = 0.702), followed by self-management behaviours and health-related quality of life (HTMT = 0.665), patient education and health-related quality of life (HTMT = 0.624), patient education and health literacy (HTMT = 0.617), health literacy and health-related quality of life (HTMT = 0.545), and health literacy and self-management behaviours (HTMT = 0.469). All values considered suggest that the constructs were empirically separable and measured different concepts within the proposed model as

the values were below the conservative cut-off of 0.85 and much liberaler threshold of 0.90. Thus, the next few steps of the test of the structural model and test of the hypotheses were then applicable (Sagen et al., 2023).

As indicated in Table 5, the levels of effect that each of the predictor constructs has on the endogenous variables differs. Patient education had a large effect on health literacy ($f^2 = 0.463$) and an even greater large effect on self-management behaviours ($f^2 = 0.726$) and also contributed a large percentage of the variance in both mediating constructs. A medium effect of self-management behaviours on health-related quality of life ($f^2 = 0.159$) was obtained, which indicates that health literacy in the patients' self-management of their disease (effective taking of medicines, monitoring of symptoms, skin care, stress management, and others) had significantly influenced health-related quality of life. Patient education direct effect on health-related quality of life was a small effect ($f^2 = 0.039$); and health literacy direct effect had on health-related quality of life was a small effect ($f^2 = 0.057$). These findings showed it was the health literacy and self-care behaviours which mediated the direct effect of patient education on QOL. Overall results of the respondents had met the criteria for the conventional approach to PLS-SEM as $f^2 = 0.02, 0.15$, and 0.35 are considered as small, medium, and large effect size, respectively (Lasington & Lasington, 2025).

Table 6 revealed that the structural model had a good explained relevance and predictive relevance as well as an overall model fit. 31.7% of health literacy ($R^2 = 0.317$, adjusted $R^2 = 0.315$) and 42.1% of self-management behaviours ($R^2 = 0.421$, adjusted $R^2 = 0.420$) were explained by patient education, and patient education, health literacy and self-management behaviours together explained 46.2% of health-related quality of life ($R^2 = 0.462$, adjusted $R^2 = 0.459$). The results presented in the above show the acceptable explanatory values with respect to health related quality of life and self-management behaviours. In all the cases values of the Q^2 predicts were above zero, thus indicating the out-of-sample predictive relevance of the model with respect to the health literacy (0.313), health-related quality of life (0.332), and self-management behaviours (0.418). The RMSE scores of the endogenous constructs were in the range of 0.766 – 0.832, and the MAE scores in the range of 0.626 – 0.675 suggesting acceptable errors in prediction. Moreover, the value of saturated model and estimated model were each less than the recommended value of 0.08, with the value of the NFI being over the accepted value of 0.90. Therefore, the model was validated over time and was found to be valid for this study to predict health literacy, self-management behaviours and health related quality of life among patients suffering from psoriatic (Kara et al., 2025).

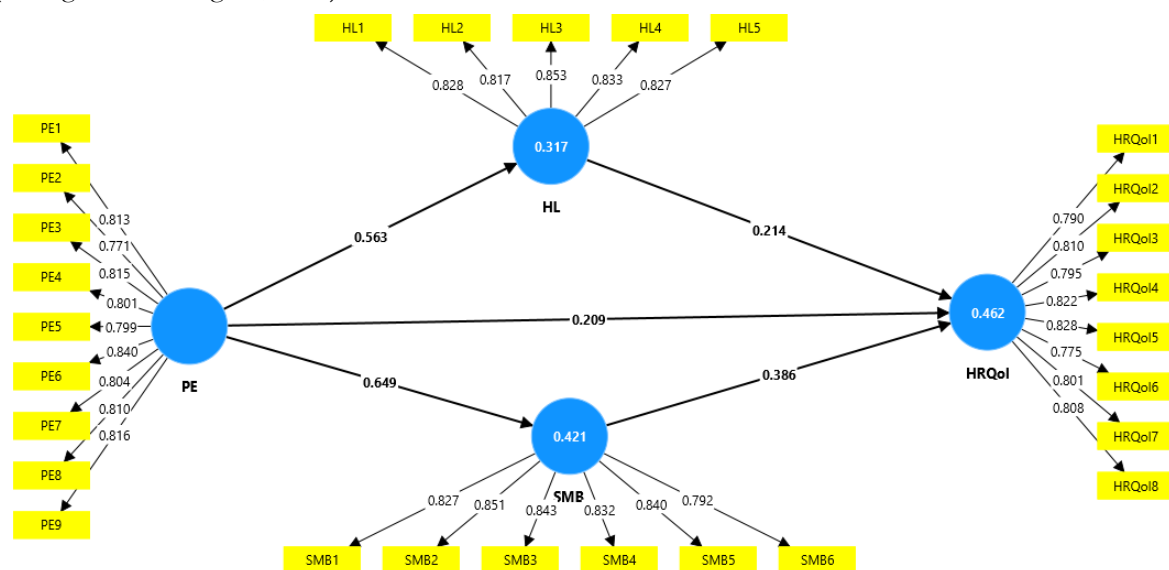


Figure 3: SEM with Factor Loadings

Table 2: Reliability, Validity and Variance Inflation Factor (VIF)

Construct/Items	OuterVIF values	Factor Loadings	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
Patient Education			0.933	0.934	0.653
PE1	2.354	0.813			
PE2	2.029	0.771			
PE3	2.427	0.815			
PE4	2.257	0.801			
PE5	2.280	0.799			
PE6	2.702	0.840			
PE7	2.309	0.804			
PE8	2.315	0.810			
PE9	2.397	0.816			
Health Literacy			0.889	0.889	0.692
HL1	2.155	0.828			
HL2	2.005	0.817			
HL3	2.349	0.853			
HL4	2.225	0.833			
HL5	2.097	0.827			
Self-Management Behaviours			0.910	0.912	0.690
SMB1	2.215	0.827			
SMB2	2.530	0.851			
SMB3	2.398	0.843			
SMB4	2.315	0.832			
SMB5	2.387	0.840			
SMB6	2.005	0.792			
Health-Related Quality of Life			0.922	0.923	0.646
HRQol1	2.124	0.790			
HRQol2	2.229	0.810			
HRQol3	2.126	0.795			
HRQol4	2.403	0.822			
HRQol5	2.401	0.828			
HRQol6	1.996	0.775			
HRQol7	2.195	0.801			

HRQol8	2.290	0.808
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Table 3: Collinearity Statistics (Inner VIF)

Relationship	VIF	Decision
HL -> HRQol	1.476	No multicollinearity issue
PE -> HL	1.000	No multicollinearity issue
PE -> HRQol	2.091	No multicollinearity issue
PE -> SMB	1.000	No multicollinearity issue
SMB -> HRQol	1.741	No multicollinearity issue

Table 4: Discriminate Validity Heterotrait-Monotrait (HTMT) Ratio

	HL	HRQol	PE	SMB
HL				
HRQol	0.545			
PE	0.617	0.624		
SMB	0.469	0.665	0.702	

Table 5: Effect Size of Latent Variables

Path	f-square	Effect Size
HL -> HRQol	0.057	Small
PE -> HL	0.463	Large
PE -> HRQol	0.039	Small
PE -> SMB	0.726	Large
SMB -> HRQol	0.159	Medium

Table 6: Model Fit

	R-sq	Adj R-sq	Q ² predict	RMSE	MAE	Saturated Model	Estimated Model
HL	0.317	0.315	0.313	0.832	0.675		
HRQol	0.462	0.459	0.332	0.820	0.670		
SMB	0.421	0.420	0.418	0.766	0.626		
SRMR						0.035	0.037
NFI						0.944	0.945

Hypothesis Testing:

H1: Patient education had a positive and significant relationship with health-related quality of life among patients with psoriasis.

As seen in Table 7, patient education has significant positive effects on HRQoL ($\beta =$

0.209, SD = 0.048, $t = 4.307$, $p < 0.001$). This finding showed a significant improvement in HRQOL among the patients having psoriasis was linked to a higher level of education. Therefore, it can be concluded that there was support for H1 (Lindgren et al., 2024).

H2: Patient education had a positive and significant relationship with health literacy among patients with psoriasis.

Health literacy was found to have an important positive relationship with patient education ($\beta = 0.563$, $SD = 0.032$, $t = 17.686$, $P < 0.001$) as presented in Table 7. From this finding, the authors envision enhancements in how greater amounts and types of information about psoriasis will be accessed, digested, assessed, and utilized by patients when they receive a more comprehensive education. Hence, H2 was thus encouraged (Brandl et al., 2022).

H3: Patient education had a positive and significant relationship with self-management behaviours among patients with psoriasis.

Patient education was also statistically significantly and positively correlated with the patients' self-management behaviours ($\beta = 0.649$, $SD = 0.026$, $t = 25.042$ and $p < 0.001$ - see Table 7). This was significant because it demonstrated increases in medication adherence, checking with the doctor, skin care, coping strategy, avoidance of triggers and seeking help when needed as a result of increasing patients' education. So, financial aid to H3 was provided (Kurt et al., 2024).

H4: Health literacy had a positive and significant relationship with health-related quality of life among patients with psoriasis.

The results of the end-of-table analysis show that the health related quality of life scores was significantly and positively related to the health literacy ($\beta = 0.214$, $SD = 0.040$, $t = 5.355$, $p < 0.001$). This showed that those who were more convenient accessing and utilizing the knowledge of psoriasis were more satisfied with their physical, psychological and social health. So the supports were made available for H4 (Kilinc et al., 2023).

H5: Self-management behaviours had a positive and significant relationship with health-related quality of life among patients with psoriasis.

It was found that the QOSH was positively and statistically significant with the self-management behaviours ($t = 8.634$, $\beta = 0.386$; $p < 0.001$) (see Table 7). These indicated that those who used the treatments prescribed on a regular basis and who were: good achievers were reporting quality of life improvements. Therefore, it was found that there was support for the H5 (Elbarbary et al., 2024).

H6: Health literacy had significantly mediated the relationship between patient education and health-related quality of life among patients with psoriasis.

In the indirect pathway, patient education to HRQOL through health literacy, the path coefficient $\beta = 0.024$ (standard deviation) was statistically significant and positive ($t = 5.078$, $p < 0.001$) as per given in Table 7. The effects of patient education on HRQoL also were generally in the same direction and moderately large, so it had been partly mediating HRQoL in the same direction. Therefore, H6 was supported (Beissat et al., 2025).

H7: Self-management behaviours had significantly mediated the relationship between patient education and health-related quality of life among patients with psoriasis.

The effect of direct patient education on self-management behavioral factors on health-related quality of life in this study was positive and statistically significant ($\beta = 0.250$, $SD = 0.031$, $t = 8.048$, $p < 0.001$) and as a result, was useful to include in Table 7. There were some positive aspects for self-management behaviours and both direct and indirect effects were applicable, but the positive self-management behaviours did not always correlate. As such the support of H7 was accepted. Results from the size of the indirect path indicated that the effect of the self-management behaviours is greater than the effect of health literacy again (Flurey et al., 2023).

Table 7: Hypotheses Testing (Bootstrapping)

Hypothesis	Relationship	Path Coefficient	Standard deviation	t-Value	P - values	Result
H1	PE → HRQoL	0.209	0.048	4.307	0.000	Supported
H2	PE → HL	0.563	0.032	17.686	0.000	Supported
H3	PE → SMB	0.649	0.026	25.042	0.000	Supported
H4	HL → HRQoL	0.214	0.040	5.355	0.000	Supported
H5	SMB → HRQoL	0.386	0.045	8.634	0.000	Supported
H6	PE → HL → HRQoL	0.120	0.024	5.078	0.000	Complementary Partial Mediation
H7	PE → SMB → HRQoL	0.250	0.031	8.048	0.000	Complementary Partial Mediation

Discussion:

The results showed that there was an improvement in HRQoL and statistical significance among psoriasis patient ($\beta = 0.209$, $p < 0.001$) in favor of the hypothesis H1: An improvement in HRQoL is obtained with the patient education. This discovery showed that patients' uncertainty was diminished and that their understanding helped them to be more involved in their therapy after getting to understand their condition, the different available therapies, the medication, how to monitor their symptoms and lifestyle control. This is similar to the literature search by Ghezzi et al (2024) which found that the goals of education programs could include improving knowledge and involvement in the care, coping and quality of life outcomes of people with psoriasis. Another recent study with supporting findings revealed that both information and treatment-awareness needs in accessible education remains key for patients with psoriasis, as part of patient centred care (Folkertsma et al., 2025). The direct effect size of the patient education on the QOL was smaller in terms of $f^2 = 0.039$, however, indicating that patient education alone did not have a significant effect on QOL. The findings were aligned with those of recent reviews which noted mixed outcomes across education and nonpharmacological interventions likely due to variations in intervention content, modality,

intensity, follow-up duration, disease severity, and how the outcomes were measured (Gong et al., 2025). Thus, educational support seemed to be most helpful, when combined with behavioural, psychological and clinical support.

The effect of patient education was shown to be significantly associated with health literacy with a strong positive correlation and large effect size ($\beta = 0.563$, $p < 0.001$). This discovery confirmed that clear, relevant and individualized education was enhancing the access, understanding, evaluation and application of information for patients' psoriasis. The results agreed with previous research, patients' and their families' belief about psoriasis, called misguided beliefs, frequently has negative consequences on informed decision making; systematic teaching on how to better inform patients and their families' decision making was a need (Matias et al., 2024). It was also similar to recent research in dermatology that focused on the effectiveness of various educational approaches according to the readers' literacy level (Dong et al., 2025), preferably with visual, interactive or gaming approach. However, other studies underscored that information is not enough to ensure appropriate health literacy, as patients may find high-level terms, even misinformation, and internet barriers to access to information, as well as contradictory information online. Here in the present study the tight bond might have been because of the fact that the information

provided was easy to understand or because the information was given by the care provider rather than to the provider in written text or via web.

Patient education was strong and positively related to self-management behaviours ($\beta = 0.649$, $p < 0.001$) and this path had the highest effect size of any path in the model ($f^2 = 0.726$), supporting H3. The results showed that people's use of their medicines was now appropriate, they had changed their skin-care, they understood how to ensure they kept their symptoms under control, and they knew how to avoid triggers and how to manage stress. Collected evidence demonstrated that the use of medication was becoming appropriate, that skin care was progressing to what is recommended and that people had learnt how to self monitor signs and symptoms, how to avoid provoking and triggering their symptoms and that they could manage their stress levels and seek assistance from a professional when necessary. Recent studies have reported a positive effect of training interventions on education where there was structural training for patients, leading to an increase in patient knowledge related to the disease of psoriasis and self-care behaviors (Picariello et al., 2024). It also had been linked to digital self-care research as demonstrated by Foo, Yan et al. (2023) and Lachappelle, Clauss et al. (2025) with the ability of mobile communication, reminders and regular easy access to health information, to assist psoriasis management beyond the clinic. However, whereas Huq & Chowdhury (2024) reported that adherence interventions in PS have yielded inconsistent effects across the studies. These differences could be explained by different types of patient receiving the treatment, patient beliefs about the treatment, side effects, psychological distress, length of treatment, and having access to follow up care. The present results suggested that more effective self-management changes occurred when the education entailed about reinforcement, solving of problems individually, continuing relationship with the professional, and practical skills.

For hypothesis H4 which stated that health-related quality of life was going to show a positive and significant relationship to health literacy, a small effect size ($f^2 = 0.057$), but positive and significant ($\beta = 0.214$, $p < 0.001$) relationship was observed. A patient that was able to understand and utilize the information could have helped to better communicate with health care workers, to make decisions to seek treatment, and could have had a greater control of their psoriasis. This was in line with the growing body of evidence regarding health literacy in inflammatory diseases, in which inadequate health knowledge could lead to reduced involvement in treatment and management and limited access to necessary help and support, as well as to reduced health literacy (Calixto et al., 2023). Health literacy has also been recently linked to an appropriate adherence to the prescribed health care treatment: those who understood their prescribed treatments and associated side effects would be more likely adhere to treatment appropriately (Cordingley, Nelson, Nelson, et al., 2022). The present study's small effect, however, indicated that health literacy was not independently associated with the quality of life. Moreover, a number of other more personalized factors, including disease burden, the presence of lesions, itching, pain, stigma and depression, anxiety, comorbidities, burden of therapy, and social context influenced psoriasis-related quality of life (QRQL) (Carpenter et al., 2024). Thus, health literacy had been a key enabling resource, but its impact might have hinged on its ability to convert to the uptake of long-term self-health management and to facilitate optimal medical care.

The self-management behaviours were shown to be statistically significant and positively associated with health-related quality of life ($\beta = 0.386$, $p < 0.001$) which was supported by H5, and had moderate effect size ($f^2 = 0.159$). This proved to be the closest you can get to quality of life as choices patients make in their lives play a crucial part in the physical, psychological and social elements of maintaining a healthy lifestyle. This conclusion confirmed recent reviews

showing there may be benefits to long term management of psoriasis using an integrated management approach along with lifestyle modification, exercise, nutritional intervention, psychiatric counseling, managing sleep and making stress reduction strategies (Huang et al., 2023). All were also agreed there was evidence to show that digital interventions can support symptom monitoring, enable interaction with patients via the provider, act as reminders for patients to take treatment and engagement in disease management (Shen et al., 2025). However, not all types of behaviour or psychological interventions had consistently increased the quality of life. Effectiveness, for example, with psychosocial approaches differed according to intervention type (Thornton et al., 2025) and effects on the quality of life were found to be variable with the psychological approach (Uwumiro et al., 2024). There was a wide spread which may have been linked to the need for: Behaviour management – to help support the quality of life for these patients; Clinical disease control – to help support clinical efficacy – patients may be able to self-manage the condition, but this should not replace successful pharmacological management of the condition.

The mediation analysis found that health literacy is significantly mediating patient education and the health aspect of the HRQoL (indirect $\beta = 0.120$; $p < 0.001$) supporting H6. When the direct effect was observed to be significant, partial mediation was found in which health literacy was complementary, and both effects went in the same direction. This discovery opened a window into patient education in its ability to equip patients with the ability to understanding treatment and information, communicate with health care professionals and to make informed health decisions which accounted for some of the improvement of their quality of life. This discovery was consistent with the ongoing move towards education that aligns with patients' understanding, language, internet usage and personal histories: psoriasis and other inflammatory skin diseases (Vestergaard et al., 2024). However, only some

of the potential mediators (including self-efficacy, treatment satisfaction, shared decision making, coping, social support, and anxiety reduction) on which education might have an impact on quality of life were considered because the mediation was partial. Moreover, the smaller indirect effect due to health literacy indicated that it was important to know the information, but not to necessarily implement the behaviour.

Patient education had another significant indirect effect on HRQOL (indirect $\beta = 0.250$, $p < 0.001$) favoring H7 with a significant relationship between patient education and self-management behaviours. Only part of the population followed this pathway (joint action to PS) and stronger than the indirect pathway (via health literacy). The results revealed that greater quality of life benefits occurred when the information was provided to the patients and then absorbed into their treatment: changes back to their treatment, worrying about symptoms, skin care, lifestyle changes, stress management, and early seeking of care. The interpretation was corroborated with recent intervention research, which revealed that patient knowledge and behaviours improved with intervention using real self-care training along with follow-up, and that these improvements led to improvements in psoriatic outcomes (Cassalia et al., 2025). It also concurred with the systematic review by Al-Worafi (2024) which found four factors to be key areas of adherence-enhancing interventions: education, continuity, reminders, and patient engagement. In contrast, where mediation could only have taken part as a partial mediation, the application of other clinical and psychosocial pathways to the context was not irrelevant; the mediation as self-management showed there is a greater role of the mediation in behaviour than just the information alone.

Overall, results showed improvements in health-related quality of life occurred directly and indirectly as a result of patient education, with the indirect effect being represented by self-management behaviours. There was high between-person variance in health literacy and in

health self-management behaviours, and 46.2% of the variance in the health related quality of life (HRQOL) of the patients was explained by patient education. They are the findings of these that proceeded from previous findings as they were found to be the three steps required in providing information, understanding/evaluating of information and assimilating the new information in the process of self-management in the longer term (Jendoubi et al., 2022). The results in this study thus thoughtfully backed the need for an integrated approach that launches a dermatological service involving multidisciplinary clinical management, psychological support, digital follow-up, individualized counseling, and literacy-level advocate education and behavioral training. On the other hand, it is important to keep in mind that the results were to be interpreted in correlationistic terms; correlational bias of the cross section could have arisen due to common method, and social desirable effects, as the data was self-report. Future research addressing the impact of education on health literacy, health self-management and quality of life should be undertaken using a longitudinal or intervention study design to determine whether improvements in education positively impact the outcome (Barnett et al., 2024).

Theoretical implications

The study added to the knowledge of patient education in psoriasis therapy in that patients' education had both direct and indirect effect on their HrQoL via health literacy and self-management behaviours. Patients' education level found to be directly related with quality of life which is rightful according to Social Cognitive Theory, which states that patient knowledge, patients ability, patients outcome expectations and patients self-confidence have an impact on health outcomes. Although the magnitude of these direct effects of patient education on quality of life was modest, it indicated that patient education alone had not resulted in large gains. Instead, patient education was found to have significant effects on health literacies and self-management behaviours in

their patients, indicating that patient education is being largely used to whet patients' interest in learning about health information and to arm them with skillsets for self-managing their disease. Important to note it is also an additional finding of this study that complements and confirms the results of previous psoriasis studies, predominantly which were focusing on one or an exclusively on another aspect, such as education, adherence, self-care and/or quality of life (Pettersson et al., 2025).

This significant mediating role of health literacy between education and quality of life was a reinforcement of the Nutbeam's health-literacy model which proposes that one of the impacts of education on quality of life has been through the capacity of health lovers to access, comprehend, appraise and act on health information. The relative small size of the direct effect of health literacy on quality of life, however, highlighted that the knowledge of information was an enabling (but not causative) factor rather than an outcome of quality of life. This was especially true if they were talking about the dimension of implementing a behavior for health sector's health literacy. This finding is consistent with recent findings that being un- or under-informed about health and health care can hinder participation in health care, as well as understanding health and the ability to self-manage for a range of dermatological and inflammatory diseases (Blum et al., 2024). The authors wanted to make an attempt to adapt the health-literacy framework to consider health literacy as a variable that is subject to change, not a demographic or personal characteristic, in the research.

This increased mediating effect of self-management behaviours were consistent with Chronic Disease Self-Management, which considers medical, behavioural, and emotional self-management as key processes in chronic disease control over the long-term. The results demonstrated that education brought about greater improvements in key aspects of treatment, healthcare seeking when needed, stress management, skin care and avoidance of triggers, among those who had incorporated

knowledge of their treatment plan. These readings confirmed the recent findings of the importance of structured self-care guidance, team-based care for psoriasis management, digital monitoring devices, and patient education regarding psoriasis (De Meyst et al., 2025). The additional partial mediation results showed that the indirect effects of education on the quality of life did not fully explain the relationship between education and quality of life. Several other mechanisms, such as self-efficacy, shared decision making, coping ability, treatment satisfaction, social support, and psychological well-being may have thus contributed to the direct effect attained not explained.

Practical implications

The findings were pertinent to the dermatology care because they revealed that educating patients did not need to be limited to distributing pamphlets and written materials to the patients, or to giving them a few directions on how to treat the disease. Structured, individualized and literacy responsive education should have been provided to dermatologists, nurses, pharmacists, allied health professionals and to others with regard to causes of the condition, expectations of therapy, use of medications, potential adverse effects, symptom monitoring, lifestyle/behavioral risks, psychosocial risks, and the availability of support. Teach-back, taking language, educational literacy and digital access of patients and their cultural differences into consideration when selecting educational materials to share with patients, and having patient questions. These methods corroborated those of recent studies that emphasized the need for addressing the non-met needs, increasing communication, and delivering personalized treatment in the management of some skin conditions like psoriasis (Prignano et al., 2024).

Patient education and patient self-management behaviours exhibited a strong correlation and this indicates that patient education should have been accompanied by some kind of practical behavioural aspects, instead of just a knowledge element. Instruction in medications,

individualized skin care plans, symptom diaries, identifying triggers, training in stress management, reminder of medications and follow-up appointments may have been introduced. Although mobile apps, messages and/or online platforms could have also delivered for out-of-clinical learning and self-management they would have required to be tailored to address variations in digital and health literacy (Mpofana et al., 2024). Some recent qualitative evidence offered hints of the presence of capability/opportunity, stigma and access barriers, which should not have been overlooked in designing interventions that would have addressed a pragmatic and psychosocial problem areas rather than assumed what all patients were able to do or understand when viewing information (Skov-Sørensen et al., 2025).

So the consequence for healthcare managers was that the findings indicated there was a need to establish a time where healthcare services began to focus on the onset of integrating psoriasis education and support for self management with a routine service plan rather than it being included as an ancillary service to medicines management. A standardized approach to education could have been instituted in the hospital and clinic setting where dermatologic professionals are working; staff could have received education on the patient's right to information and health literacy; an educator or a specialist nurse could be hired to provide education; health outcomes (dedicated to educating about the disease but also outcomes related to health) could be followed up and recorded with the patient. Potential resources could also have been allocated to interdisciplinary work (dermatology, nursing, pharmacy, and psychology) and to nutrition and general primary care (which was recently highlighted by the advantages on a holistic approach in the treatment of (Sahu et al., 2025)). The model explained 46.2% of the variance in the health-related quality of life, so the organizational interventions had meaningful impact that could have been facilitated by the effective treatment, or monitoring first, or by

the organizational interventions being a primary factor in the model.

Those who benefitted from such real world contributions were the patients who suffered from diseases like psoriasis and could have access to better understanding, may have gained in confidence, they may be able to manage their disease better and improved physical, psychological and social health. Clarify of how to customize communication and behaviour support could have benefited healthcare workers; the results could have informed managers on how to enhance quality and continuity of services, staff development and resources allocation. The policy makers and patient organizations may have incorporated that information in their planning documents to establish the national education requirements, public awareness information, or an easy-to-find programme on the Internet. Finally, a validated framework for mediation could have provided a foundation for creating future experimental and cross-cultural studies to evaluate the impact of the improvements in education, health literacy and self-management on a consistent improvement of psoriasis related quality of life.

Conclusion

Although advances were made in the treatment of psoriasis, this study was based on the continuing issue that many patients still were not properly informed about their condition, not able to take advantage of treatment, were not very strong in self-management, suffered from psychological distress and had lower scores in health-related quality of life. The study investigated the direct effects of patient education on HRQOL, as well as the indirect effects via health literacy, self-management behaviour. The results indicated that health literacy, health-related self-management behaviours and health-related quality of life were significantly positively affected by the patient's education. Again, quality of life was significantly and positively related to health literacy and self-management behaviours and partially influenced by patient education and health-related quality of life. The stronger mediating mechanism

suggested by the results was that of self-management behaviours, which indicated that once amalgamated with patients' behaviour in adhering to their medication, monitoring their symptoms, taking care of their skin, avoiding triggers, and managing their stress and seeking health care at time, this approach has caused more positive outcomes when it comes to educational information. These results are in line with recent evidence indicating the need for patients' active engagement when managing their psoriasis, and the potential benefits of educational, behavioural, digital and non-pharmacological support on improving healthcare outcomes and quality of life, which was found to be variable among patient populations and healthcare settings.

Theoretically, one of the contributions that the study made to the topic was the ability to bring together four theory sources to create one unified approach specific to psoriasis, which included the Social Cognitive Theory, health-literacy framework, the Chronic Disease Self-Management model and the Wilson and Cleary quality of life model. It demonstrated that the education of patients in addition to direct impact on the quality of life of patients, could do so indirectly too, through the perspective of cognitive and behavioural. The findings implied an education program in dermatology services should include more emphasis on personalized, structured education, literacy, and behaviour-oriented education instead of just written messages and short counselling sessions. The results might have contributed to standardisation of education protocols, teach back, self-management training, setting up of tailored digital follow up systems, multi-disciplinary support services provided by dermatologists, nurses and pharmacists, management and policy makers. In recent years not only has continuity of care been described as an issue with reduced health literacy and information, and digital inequalities, but so too has self-management been proven as the primary factor keeping skin disease caused by inflammation from getting derailed, such as psoriasis.

However, there were a number of shortcomings in the study. It was not developed for capturing causality in its cross-sectional form and the purposive sampling of settings across dermatology could have taken away generality of findings to other populations and health systems. Additionally, recall bias, social-desirability bias and common-method variance might have occurred due to the use of self-reported questionnaires. Next, the model lacked of other factors that have been shown to be associated with quality of life, such as social support, psychological distress, self-efficacy, socioeconomic status, disease severity, and treatment modality. Future studies could thus have used a longitudinal experimental and a multi-centre design in an attempt to determine if the health literacy, self management, and quality of life improvements were prior to improvements in patient education. Further research could have investigated face to face, nurse-led, peer supported and digital education programmes, as well as subjective measures, including treatment satisfaction and burden, recovery and return to work/familial activities, and methodological differences in demographic and clinical subgroups, serial and moderated mediation and objective measures should include treatment adherence, the severity of the condition, utilization of healthcare and long-term clinical outcomes. The study found that increasing patients' understanding of health information via education and helping patients transfer their knowledge into continued self-care was the most effective method to patient education overall.

Limitations

There were a number of limitations in this investigation which should have been taken into account in the interpretation of the results. The first is a cross-sectional study, as this design did not allow for the inference of temporal ordering or causal relationships of patient education, health literacy, self-management behaviours and health related quality of life. While the PLS-SEM results had revealed significant direct and indirect impacts, they did not validate that the changes in literacy related to improvements in

education while the changes in behaviour and quality of life resulted from changes in education. Second, limited generalizability of results might have resulted from using purposive sampling and the sampling sites consisted of dermatology clinics and hospitals. Third, all variables were assessed with self-administered questionnaires, and this might have led to recall bias, social-desirability bias, and to common method variance. Some persons in the sample may also have over-reported their desirable self-management skills and/or under-reported treatment challenges. In addition, the study had only included a small set of constructs and not several additional clinical or psychosocial factors that may impact health-related quality of life, including the severity of their disease, location of their disease, treatment history, underlying comorbidities, depression/anxiety, psoriasis stigma, self-efficacy, treatment satisfaction, social support, and socioeconomic status. It was crucial for this limitation as it is high time to observe that interactions between clinical, psychological, behavioural and social factors, not just education, play a role in the context of psoriasis and QOL. Thirdly, recent reviews of interventions to support adherence, non-pharmacological interventions (NPIs), patient education and digital interventions reported several different types of interventions, yet the study failed to compare across the modes, intensities, and durations of patient education.

Future Research Directions

The study did not measure against the aspects of longitudinal design and experimental design, and further research should examine these features of the design to determine whether and to what degree patient education led to increases in health literacy and self-management behaviours and decreases in negative outcomes, such as poorer quality of life, over time. Randomised controlled trials (RCTs) could have been done to compare the education with the literacy-sensitive, nurse-led and peer-supported, mobile-based or multidisciplinary programmes; follow-up measures to determine maintenance of impact of intervention on literacy could have

been repeated. In addition, the external validity of the samples used in the conducted multicentre and cross-national studies was rather limited and, in such cases, too small for evaluation of whether the suggested linkages were replicated in different countries, across cultures, in low and high levels of literacy, by age, and in various clinical subgroups and socioeconomic settings. Several factors were considered but not included as additional mediators or moderators to explain the variation in quality of life in a future model such as disease severity and treatment modalities, psychological distress, shared decision making, social support, stigma, and digital health literacy, self-efficacy. This would have been done based upon the recent studies showing that clinical,

emotional and social as well as service related issues impinged on adherence and self-management. Self-reported should also have been linked to objective measures including the Psoriasis Area and Severity Index and refill data from pharmacy visits, electronic monitoring of medicines and clinic visits as well as health care utilization and engagement with digital-app. Finally, a study would need to evaluate the cost-effectiveness, access to and implications for equity in digital self-management interventions given the promising findings and mixed findings of other recent reviews regarding inequity in access to and engagement with these tools, and mixed findings with regards to the integration into routine care.

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