

# ***Exploring Innovative Applications of Behavioral Economic Theories to Enhance Eczema Care and Outcomes***

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**Abstract:** This study explores the innovative application of behavioral economic theories to enhance eczema care and improve patient outcomes. The research focuses on three potent strategies within the realm of behavioral economics: nudging, financial incentives, and digital interventions with commitment contracts. Incorporating financial incentives into eczema care can potentially bolster medication adherence, a critical component in effectively managing the chronic trajectory of this condition. By providing tangible rewards or incentives, patients may be motivated to adhere to prescribed treatment regimens more consistently. Furthermore, this paper underscores the transformative potential of digital interventions, particularly commitment contracts, in cultivating proactive and patient-centered approaches to disease management. Leveraging technology, these interventions have the potential to revolutionize healthcare delivery by promoting enhanced adherence and facilitating personalized and effective treatment paradigms. This research is grounded in a comprehensive review of contemporary studies, offering valuable insights into the effectiveness of these strategies. The findings of this study paint a promising picture for the future of eczema management, suggesting that the integration of behavioral economic principles can lead to more effective and patient-centric care, ultimately improving outcomes for individuals living with eczema.

**Keywords:** Behavioral economics, Eczema Care, Nudging, Financial Incentives, Digital Interventions/Commitment Contract

## **1. Introduction**

Eczema, medically referred to as atopic dermatitis, is a chronic and prevalent skin condition affecting a substantial portion of the global population [1]. It manifests as persistent red, inflamed, and pruritic skin, often extending throughout an individual's lifetime. Epidemiological data indicates that eczema afflicts approximately 15-20% of children and 1-3% of adults on a global scale, rendering it a significant public health concern. The incidence of eczema exhibits geographical disparities, influenced by a complex interplay of environmental and genetic factors [1].

In contemporary healthcare, the management of chronic conditions, such as eczema, necessitates innovative strategies aimed at enhancing patient compliance and achieving favorable clinical outcomes [2]. While clinical interventions remain pivotal, the integration of behavioral economics principles offers a valuable avenue for shaping individual behavior toward the attainment of improved health outcomes. Rooted in the amalgamation of insights from psychology and economics, behavioral economics presents a diverse array of strategies that can be strategically employed to augment eczema

care and foster more favorable outcomes. Given the escalating global prevalence of eczema, the application of behavioral economics assumes timely significance and promises to be a transformative intervention.

This research embarks on a comprehensive exploration of three key areas where the principles of behavioral economics can exert substantial influence on eczema management. Firstly, it elucidates the potential of subtle nudging techniques in curtailing alcohol consumption, a recognized trigger for eczema exacerbations, thereby promoting a culture of mindful consumption. Secondly, it investigates the transformative power of financial incentives in bolstering medication adherence, catalyzing motivation among individuals to consistently adhere to their prescribed treatment regimens. Additionally, this study underscores the pivotal role played by digital interventions and commitment contracts in streamlining eczema care. These commitment contracts function as binding agreements, compelling individuals to adhere diligently to their care regimens, thereby instilling a disciplined approach to the management of their condition.

In sum, this research offers a comprehensive exploration of the intersection of behavioral economics and eczema care. By examining these three critical application areas, it sheds light on how behavioral economics principles can be strategically harnessed to enhance eczema management, improve patient adherence, and ultimately yield more favorable clinical outcomes.

## **2. Effects of Alcohol and Tobacco on Eczema**

Within the domain of healthcare, the role of behavioral factors in shaping the management of chronic diseases, particularly in conditions characterized by persistent and recurrent inflammation like eczema, is of paramount significance. Notably, the influence of behavioral choices such as alcohol and tobacco consumption on the exacerbation of eczema symptoms has garnered attention. Alcohol consumption, characterized by its dehydrating effects, can further desiccate the skin, rendering it more susceptible to irritation and inflammation. Concurrently, alcohol can induce eczema flare-ups through its vasodilatory properties, leading to itching and erythema. On the other hand, tobacco use compromises both the immune system and skin integrity, creating an environment conducive to the exacerbation of eczema [3].

In light of the detrimental impact of alcohol and tobacco consumption on individuals with eczema, the development of strategies to mitigate these triggers assumes a critical role. It is within this context that the theory of nudging, a foundational concept in the field of behavioral economics, emerges as a potent tool. Nudging theory aims to guide individuals toward choices that align with improved skin health outcomes, thus addressing the challenge of managing eczema in the presence of these trigger factors.

## **3. The Role of Nudging Theory**

The concept of "nudging" occupies a central position within the expansive domain of behavioral economics, prominently introduced by Richard Thaler and Cass Sunstein in their seminal work, "Nudge: Improving Decisions about Health, Wealth, and Happiness" [4]. This theoretical framework underscores the potent influence of the subconscious mind on individuals' decision-making processes, asserting that inconspicuous, subtle prompts can effectively steer individuals toward making better choices, all while preserving their autonomy and without necessitating significant alterations to financial incentives. Essentially, a 'nudge' represents a facet of choice architecture, discreetly guiding individuals toward specific decisions by capitalizing on inherent human cognitive biases favoring paths of least resistance and choices conforming to social norms and heuristic thinking.

Within the context of eczema management, the application of nudging theory assumes a pivotal role. Strategic nudging interventions have the potential to guide individuals toward adopting lifestyles

and behaviors conducive to mitigating eczema triggers and promoting skin health. The seamless integration of nudging strategies into eczema care frameworks can empower healthcare professionals and policymakers to cultivate environments that organically encourage individuals to make choices aligned with improved health outcomes. This approach lays the foundation for the development of more effective, patient-centered strategies in the management of this prevalent and persistent skin condition.

### **3.1. Nudging Interventions on Alcohol and Tobacco Consumption**

Recent years have witnessed a growing interest in the potential of nudging interventions to modify behavioral risk factors associated with alcohol and tobacco consumption. An influential contribution to this emerging field has been made by Mario Cesare Nurchis and his research team, who have undertaken a comprehensive investigation into the efficacy of nudging strategies in preventing and controlling alcohol and tobacco consumption among adults. This research, published in the *International Journal of Environmental Research and Public Health* in 2023, comes at a pivotal juncture as the global health community seeks innovative approaches to mitigate the substantial risks linked to non-communicable diseases, prominently exacerbated by alcohol and tobacco use, as highlighted by the World Health Organization.

The methodological approach adopted by Nurchis et al. involved a meticulous scoping review of existing literature, with the aim of systematically mapping the empirical foundation exploring the application of nudging interventions in the prevention and/or control of alcohol and tobacco consumption among adult populations. This rigorous approach facilitated a comprehensive analysis, enabling the research team to categorize various types of nudging interventions and critically assess their effectiveness.

Upon a thorough review of 20 selected studies, the research identified three primary categories of nudging interventions: those designed to increase the salience of information or incentives (IS), default choice modifications (DF), and interventions providing feedback (PF). The findings of the study yielded promising results, with a substantial proportion of studies utilizing IS and PF strategies reporting success, particularly when IS strategies were combined with complementary interventions. Notably, PF interventions demonstrated heightened efficacy in multi-component interventions targeting alcohol consumption. However, it is worth emphasizing the need for further research to explore the impact of these nudging strategies across diverse socio-economic strata and among younger populations.

Considering the implications of these findings in the context of eczema management, Nurchis et al.'s study underscores the potential of nudging interventions as potent tools for shaping positive behaviors among individuals affected by eczema[6]. Given the established role of alcohol and tobacco consumption as triggers for eczema flare-ups, the integration of successful nudging strategies holds promise as a cornerstone in comprehensive eczema care frameworks. Furthermore, the incorporation of such strategies within educational sessions for healthcare professionals offers the potential to foster a more nuanced and proactive approach to preventing triggers and effectively managing eczema.

### **3.2. The Importance of Medication Adherence in Eczema**

In the management of chronic conditions such as eczema, the maintenance of a consistent medication regimen holds paramount importance. Eczema, characterized by recurrent episodes of skin inflammation, necessitates a sustained treatment approach to alleviate symptoms and mitigate the risk of flare-ups. Within this context, medication adherence, defined as the degree to which patients adhere to the prescribed medication regimen provided by their healthcare providers, assumes a critical role. The pursuit of optimal medication adherence is essential not only for effective disease management

but also for the prevention of potential complications that may arise from erratic treatment patterns. However, the achievement of optimal medication adherence remains a formidable challenge, with various barriers, including forgetfulness, limited understanding of treatment regimens, and financial constraints, frequently impeding consistent adherence to prescribed therapies.

In the endeavor to enhance medication adherence among adults grappling with eczema, the incorporation of financial incentives emerges as a potentially potent motivator. The establishment of a structured reward system may serve as a catalyst in encouraging patients to adhere more closely to their medication regimens. This strategic approach holds the potential not only to foster improved health outcomes but also to instill a sense of responsibility and heightened awareness among patients regarding the significance of adhering to their prescribed treatment plans.

#### **4. Financial Incentives in Behavioral Economics**

Within the intricate landscape of behavioral economics, the concept of financial incentives assumed a prominent position, serving as a crucial mechanism for guiding individuals toward decisions that aligned with prescribed or desirable outcomes. This concept was deeply rooted in the theory of operant conditioning, a fundamental psychological principle positing that behaviors followed by gratifying consequences were more likely to be repeated. In the realm of financial incentives, this principle translated into the deliberate incorporation of monetary rewards or penalties to shape decision-making and behavior [6,7]. This practice capitalized on humanity's intrinsic inclination toward pursuing gains and avoiding losses [7,8].

Financial incentives could take various forms, encompassing cash rewards, vouchers, discounts, or even reduced insurance premiums, all with the overarching goal of establishing a reward system that nudged individuals toward positive behavioral modifications. These modifications might encompass adherence to medication regimens or active participation in healthy lifestyle initiatives. The underlying premise was that the immediate rewards or penalties associated with a particular behavior held substantial sway over an individual's motivation to engage in or abstain from specific actions, ultimately influencing choices in a manner that aligned with broader objectives of well-being and prosperity [7,8].

##### **4.1. Methodology**

To provide a comprehensive and systematic overview of the research landscape, the authors employed a scoping review methodology, adhering to the established guidelines outlined in the Joanna Briggs Institute Reviewers' Manual and following the PRISMA Extension for Scoping Review checklist. A comprehensive search was conducted across multiple databases, including PubMed, EMBASE, SCOPUS, PsycINFO, EconLit, and CINAHL. In pursuit of a holistic perspective, the search also encompassed an examination of the grey literature. The data extraction process encompassed crucial study characteristics, design features, and outcomes, with a single reviewer conducting the initial extraction, followed by a second reviewer independently verifying the data from twenty-five percent of the included studies to ensure the accuracy and reliability of the information extracted.

##### **4.2. Results**

The review yielded thirty-four pertinent studies, predominantly focused on diabetes mellitus, human immunodeficiency virus, and cardiovascular and renal diseases, primarily based in the USA. The interventions explored in these studies majorly centered on financial incentives, which were often paired with other behavioral economic concepts such as framing, social influences, reinforcement, and feedback. While the interventions showcased promising results, the effectiveness varied,

indicating a complex interplay of factors influencing medication adherence [6]. The review identified a total of thirty-four relevant studies, with a predominant focus on chronic conditions including diabetes mellitus, human immunodeficiency virus (HIV), and cardiovascular and renal diseases. The interventions investigated in these studies predominantly revolved around the application of financial incentives, frequently in conjunction with other behavioral economic concepts such as framing, social influences, reinforcement, and feedback. While the interventions demonstrated promising outcomes, it is crucial to note that their effectiveness exhibited variability, suggesting the presence of a multifaceted interplay of factors that impact medication adherence.

### **4.3. Implications for Eczema Management**

Based on the findings of this comprehensive review, there were noteworthy implications that could be extrapolated for the management of eczema. While the primary focus of the study was on chronic diseases other than eczema, the insights derived from this research held potential significance in the context of crafting interventions aimed at enhancing medication adherence among eczema patients. The nuanced approach of integrating financial incentives with other behavioral economic concepts, such as social influences and feedback mechanisms, presented an intriguing avenue for potential innovation in eczema management [8,9]. This approach suggested the necessity of adopting a multifaceted strategy to address non-adherence, one that involved a deep understanding of the unique factors contributing to non-adherence in eczema patients and the tailoring of interventions to align with their specific needs and preferences.

Additionally, the study emphasized the importance of targeting non-adherent eczema patients, offering them reminders and constructive feedback, and implementing measures that not only monitored medication adherence but also tracked clinical outcomes [9]. Such an approach had the potential to revolutionize the management of eczema by facilitating the development of more personalized and efficacious treatment plans. It was vital to acknowledge, however, that the primary focus of this research centered on chronic diseases other than eczema, signifying a notable gap in the existing literature. This underscored the need for more directed research efforts within the domain of eczema to validate and further explore the insights generated by this study.

## **5. Digital Intervention and Commitment Contract in Eczema Management**

### **5.1. Clinical Efficacy of Digital Intervention**

In consideration of the aforementioned context, the study titled "Clinical Efficacy of a Digital Intervention for Patients with Atopic Dermatitis: A Prospective Single-Center Study," authored by multiple researchers, assumes prominence. The principal aim of this research endeavor was to systematically assess the clinical efficacy of a digital intervention program explicitly designed to assist individuals afflicted with Atopic Dermatitis (AD), which represents a specific manifestation of eczema [1].

In the dynamic landscape of healthcare, digital interventions have emerged as a promising avenue for enhancing the management of various health conditions, eczema included. These interventions harness digital platforms to deliver healthcare services and education, thereby assisting patients in effectively managing their conditions and embracing healthier lifestyles. For individuals dealing with eczema, digital interventions can play a crucial role in providing essential support, particularly in terms of promoting disease awareness and facilitating treatment adherence, both of which are integral components of long-term eczema management.

The concept of a commitment contract, rooted in behavioral economics, is founded on the principle of individuals binding themselves to a predefined set of goals or behaviors with the expectation of achieving positive outcomes or desired changes.

This theoretical framework is rooted in the recognition of human proclivities, particularly the tendency to prioritize immediate gratifications over long-term benefits, which often leads to procrastination or the abandonment of goals. A commitment contract is designed to counteract this inclination by establishing a formal or informal agreement where individuals commit to specific behaviors or the attainment of defined milestones within a specified timeframe. Such commitments are often coupled with incentives for successful completion or penalties for failure. This leverages the psychological aversion to loss, where the prospect of losing something valuable, whether it be financial stakes or one's reputation, serves as a powerful motivator to adhere rigorously to the agreed-upon terms of the contract.

## 5.2. Methodology

The research, conducted over a span of six weeks, targeted adult individuals afflicted with Atopic Dermatitis (AD) spanning from mild to severe cases [7]. This intervention was administered through a mobile application, incorporating a multifaceted approach encompassing educational components related to symptomatology and triggers, treatment reminders, lifestyle coaching, and support for the adoption of healthier lifestyle practices. The effectiveness of this intervention was assessed through a comprehensive array of parameters, including the Scoring Atopic Dermatitis (SCORAD), the Patient-Oriented Eczema Measure (POEM), and the Dermatology Life Quality Index (DLQI). In addition to these objective measures, a six-item questionnaire was employed to evaluate alterations in behaviors specifically related to disease management [1].

## 5.3. Results

The study yielded promising results, with most participants (20 out of 21) successfully completing the program. Substantial improvements were observed across several key dimensions. Clinical symptoms exhibited significant amelioration, with a notable enhancement of 44%. Similarly, self-reported global severity demonstrated a substantial improvement of 46%. Moreover, a significant advancement, quantified at 41%, was observed in the parameter of health-related quality of life (HR QoL) [1].

Significantly, the intervention exerted a positive influence on treatment adherence and preventive measures, encompassing various aspects such as skincare routines, avoidance of triggers, and the acquisition of enhanced disease-related knowledge [4,5]. Intriguingly, the data revealed a positive correlation between increased treatment adherence and clinical improvement, suggesting that patients who demonstrated higher adherence to treatments experienced more substantial clinical advancements.

The fusion of digital interventions with commitment contracts held the promise of ushering in a new era in eczema management [10]. This era would be characterized by informed, empowered, and adherent patients who experienced an enhanced quality of life and improved clinical outcomes [9,10]. It heralded a future where the convergence of technology and behavioral economics paved the way for more effective healthcare delivery and superior patient outcomes in the field of eczema care.

## 6. Conclusion

In conclusion, this research underscores the substantial potential inherent in the application of behavioral economic theories to enhance the landscape of eczema care and improve outcomes. By skillfully implementing nudging strategies, it is plausible to redirect individuals away from exacerbating factors such as alcohol and tobacco consumption, thereby cultivating a healthier lifestyle that supports superior disease management. Additionally, the integration of financial incentives emerges as a promising mechanism to bolster medication adherence, a pivotal facet in the effective

management of chronic conditions like eczema. Simultaneously, the advent of digital interventions, particularly through the implementation of commitment contracts, signifies a transformative approach that facilitates patient-centric, proactive, and participatory disease management strategies. These interventions not only hold the potential to enhance adherence but also have the capacity to revolutionize the interactions between patients and healthcare providers, engendering more personalized and efficacious treatment approaches. As we move forward, it is imperative to continuously assess, adapt, and innovate these strategies, ensuring their alignment with the evolving needs and preferences of individuals. This trajectory heralds a new epoch in eczema management characterized by heightened efficacy and improved patient outcomes.

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