CORVINUS UNIVERSITY of BUDAPEST

DOCTORAL SCHOOL OF

BUSINESS AND MANAGEMENT

SUMMARY OF THESIS

of

Zsuzsanna Kun

FROM "NO WAY" TO "EVERY DAY"

How Liminal Phase Shapes Medication Adherence in Chronic Disease

Doctoral Dissertation

Supervisor

Dr. Habil Judit Simon

Budapest, 2024

INSTITUTE OF MARKETING AND COMMUNICATION SCIENCES

DEPARTMENT OF INTERCULTURAL MARKETING AND CONSUMER BEHAVIOR

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1. Research Relevance

Chronic diseases represent a significant global health challenge, characterised by long-lasting and persistent conditions that impact individuals' quality of life. These diseases can stem from various factors, including genetic predispositions (e.g., Down Syndrome), life events (e.g., birth-related traumas), accidents (e.g., limb loss), lifestyle choices (e.g., smoking, lack of physical activity), and can manifest at any stage of life. Chronic conditions such as asthma, diabetes, and cardiovascular diseases have become increasingly prevalent, underscoring the need for effective management and treatment strategies. The World Health Organization (WHO) defines chronic diseases as non-communicable, highlighting the role of metabolic and lifestyle factors in their development and emphasising the importance of long-term management and prevention strategies (Brencsán et al., 2002; Pavia & Mason, 2012; World Health Organization, 2005).

Chronic diseases are responsible for 71% of deaths globally, with cardiovascular diseases, cancers, respiratory diseases, and diabetes leading as the most common causes. The burden of these diseases is not evenly distributed, with individuals in less developed regions facing a higher risk of premature death. In the European Union (EU), chronic diseases account for a significant portion of healthcare costs and mortality, prompting initiatives to address these challenges. Hungary, in particular, has seen a rise in chronic disease prevalence, making it a focal point for health policy and research efforts (Eurostat, 2018; Kotzeva, 2022; OECD & European Union, 2016; World Health Organization, 2022).

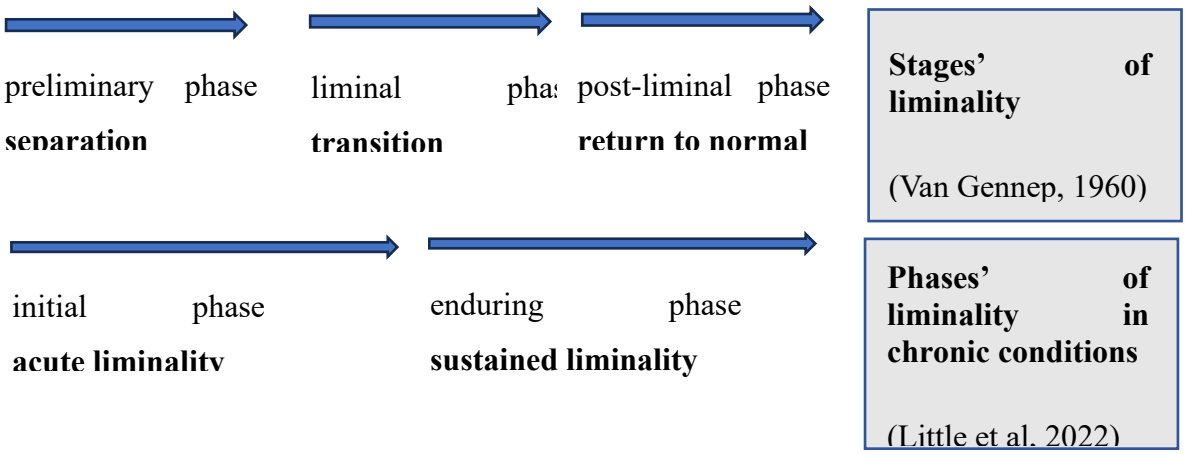
Concept of Liminality and Its Healthcare Applications

Liminality, rooted in anthropology, refers to the transitional phase or "threshold" (limen) individuals experience during significant life events, as identified by Van Gennep (1960) and expanded upon by Turner (1967). This state represents a period of ambiguity and transition between predefined roles or statuses, encapsulating individuals in a "no longer but not yet" phase. Liminality can be temporary or extended, influenced by cultural, social, and personal factors, and does not necessarily involve a change in identity. Turner's concept highlights the interstructural situation where old roles are shed, but new ones have yet to be established, rendering individuals invisible in societal structures.

Liminality has significant applications in healthcare, offering insights into the experiences of those living with chronic illnesses or disabilities ((Barrett, 1998; Murphy et al., 1988). These conditions thrust individuals into a liminal space, marked by social exclusion and a state of being neither fully sick nor healthy. This framework helps in understanding the deep impact of chronic illness on one's identity and social interactions, highlighting the complex journey towards adaptation and acceptance.

Chronic diseases introduce an ongoing liminal state due to the constant negotiation between past health and present illness. Bruce et al. (2014) and Little et al. (2022) discuss how chronic conditions, like cancer, create a sustained state of liminality, affecting individuals' identities and daily lives. The experience diverges from traditional liminal phases by presenting as a dynamic, enduring condition without a clear resolution (see Figure 1). This ongoing liminality can influence healthcare decisions, coping mechanisms, and the overall quality of life, emphasising the need for a nuanced understanding of chronic illness experiences.

1. Figure: Periodicity of liminality in the original concept and the chronic concept



Source: edited by the author based on Van Gennep (1960) and Little et al. (2022)

Liminality in Consumption

Nakata et al. (2019) extend the concept of liminality to the consumer journey, particularly in chronic disease medication adherence. This perspective underscores the non-linear nature of the consumer journey, emphasising the complex and dynamic interplay between liminality and consumption in chronic illness management.

Darveau & Cheikh-Ammar (2021) categorise consumption related to liminality into three types: liminal consumption, consumption-caused liminality, and liminality-caused consumption. These categories explore how transitions influence consumption patterns and vice versa. This research focuses on the third type with two sub-types: Commemorating liminality and Holding off liminality. According to Holding Off Liminality, consumers may delay transitions through consumption, maintaining ties to their preliminary identities (Cody & Lawlor, 2011), which also refers to the state under chronic conditions.

Studies by Cody & Lawlor (2011) and Tonner (2016) exemplify how individuals navigate liminality in consumption. Teens transitioning to adulthood and women becoming mothers illustrate private passions and enduring interests, highlighting how consumption practices are adapted to manage identity changes.

Adherence

The understanding of patient cooperation with treatment plans, traditionally referred to as 'compliance', has evolved significantly. Initially, compliance depicted a unidirectional model, emphasising physician authority over patient input (Vermeire et al., 2001). This perspective has shifted towards 'adherence', a term promoted by the WHO to signify a more collaborative, partnership-based approach between patients and healthcare providers, focusing on mutual decision-making and recognising the patient's active role in their care (Chakrabarti, 2014; Sabate & WHO, 2003). The consequences of non-adherence are profound, with significant mortality and financial costs attributed to non-compliance with medication regimes across Europe (van Boven et al., 2021).

Non-adherence is multifaceted, encompassing both intentional decisions against following treatment recommendations and non-intentional barriers such as socioeconomic constraints or healthcare system limitations (Cameron, 1996; Sabaté & World Health Organization, 2003). These factors highlight the complexity of patient behaviour and the necessity of understanding individual circumstances affecting treatment engagement.

In healthcare marketing, medication adherence is within a framework that includes therapy creation, launch, and promotion, with an emphasis on patient loyalty and adherence to treatment plans (Stremersch & Van Dyck, 2009). This approach prioritises

the design of patient-centred treatment strategies, addressing both intentional and non-intentional non-adherence by incorporating the patient's capacity and willingness to follow the treatment. Intentional non-adherence often reflects a patient's desire for autonomy and control over their treatment and life, challenging the prescribed treatment regimen to maintain a sense of normalcy (Huyard et al., 2016). This behaviour can be understood in the context of liminality, where patients navigate the transition between health and illness, try to find their identity and resist the dominance of their condition.

2. Structure of the Dissertation

This dissertation is structured into six main parts (see 1. Table**Hiba! A hivatkozási forrás nem található.**). The empirical research has a preliminary and a primary phase, with two stages in the primary phase: qualitative and quantitative.

1. Table: Structure of the Dissertation

PART	DESCRIPTION		
Introduction and relevance	relevance and prevalence		
Literature review	liminality in chronic disease and consumer studies + measurement scales		
Research Methodology	**PRELIMINARY quantitative phase**	**PRIMARY qualitative stage**	**PRIMARY quantitative stage**
	PLS-SEM - INAS Resisting Illness is moderating Correlation analysis	In-depth interviews	PLS-SEM - time since diagnosis is moderating + EFA, CFA, moderation analysis
Research Results	Resisting Illness is a moderator but has limits. -> Other liminality measure is needed -> **The disease acceptance (AADQ)** scale needs to be investigated as a moderator	- There might be a gap between diagnosis and medication taking. **- Time since diagnosis** should be investigated as a moderator	Test both AADQ and time in the moderator role **- AADQ** is not stable enough **- Time** has a moderating effect
Conclusions and limitations			
Theoretical contributions and managerial implications			

Source: edited by the author

3. Conceptual Framework

Chronic illness creates a complex dynamic for patients, challenging them to balance their current quality of life with an uncertain future (Allen et al., 2015). This state can be seen as a liminal experience, marked by an absence of normalcy (Honkasalo, 2001). Over time, patients often long for a return to everyday life, where illness does not define them but

rather integrates into their existence while preserving their individuality (Bruce et al., 2014).

This dissertation focuses on the liminal transition occurring in chronic conditions based on the framework introduced by Little et al. (2022). Understanding liminality within chronic conditions provides insight into individuals' transitional experiences as they adjust to long-term health changes.

In chronic illness, liminality unfolds in two stages. The first is acute liminality, a brief transition as patients come to terms with diagnosis and treatment. Then, sustained liminality follows, an enduring state of uncertainty influencing their choices and behaviours (Little et al., 2022).

Within the consumption realm exists a phenomenon known as "Consumption to Hold-off Liminality." This strategy comes into play when "liminal consumers" seek to reconnect with aspects of their past life or identity (Darveau & Cheikh-Ammar, 2021). It involves indulging in "private passions," where these individuals engage in activities or behaviours reminiscent of their previous phase, thus resisting a complete transition into their new liminal state (Min & Peñaloza, 2019).

The individual living with a chronic disease can be likened to the concept of a "liminal consumer" (Nakata et al., 2019). Furthermore, their state of liminality can be viewed as an ongoing and potentially lifelong journey, often spanning their entire illness duration (Bruce et al., 2014).

Individuals with multiple restrictions due to their health condition may experience what is referred to as a "private passion." This term describes moments when they intentionally deviate from their restrictions by not adhering to medication regimens to regain a sense of normalcy.

The initial phase represents the realisation of their diagnosis. The enduring, long-term phase is when individuals learn to live with their condition over a long period. It involves the sustained experience of being in a liminal state, where adaptation processes are continuous, and individuals navigate the complexities of integrating the condition into their daily lives and identity (Little et al., 2022).

The primary objective of this dissertation is to explore and understand the initial, acute liminal phase in depth. This liminality is characterised by the level of illness resistance, which terminates over time.

Based on this conceptual frame, this research will work with the following research question:

> **How do patients' initial reactions to a chronic condition diagnosis during the liminal phase influence their development of long-term medication adherence?**

4. Methodology

The methodology of this dissertation unfolds a tripartite structure (1+2) (see table 2). The first phase is an initial *preliminary phase,* This phase has utilised a former existing database, which presents certain limitations, notably the absence of temporal data on the duration since diagnosis. Under the *primary phase*, data has been directly collected to explore and model the role of liminality. This primary phase starts with a *qualitative exploratory stage*, aiming to build theory through *in-depth interviews*. The *primary quantitative stage* is based on the literature and the findings of the preliminary and qualitative stages.

2. Table: Methodological Summary For Research Steps

		Preliminary phase	Primary phase	
			qualitative stage	quantitative stage
Goal		Evaluate the role of liminality within the concept of medication adherence.	Building upon insights from the preliminary phase, investigate patient experiences for model building in the primary quantitative stage.	Validate and quantify the influence of liminal phases on medication adherence and measure the impacts.
Data collection	**Date**	January 2020	January-March 2024	March 2024
	Fieldwork	Market research agency	The PhD researcher	Market research agency
	Tool	Online questionnaire	Interview guide	Online questionnaire
Sample	**Sampling**	Selected from a representative sample of 1,000 individuals based on inclusion criteria	Participants were recruited through personal networks with an emphasis on diversity.	Recruitment through an online panel specialising in chronic diseases.
	Inlcusion criteria	- age above 30, - taking medication daily, - diagnosed with any chronic disease	- age above 18, - taking medication day, - diagnosed with diabetes / high blood pressure/ musculoskeletal disease/ high cholesterol / cardiovascular disease - diagnosed at least a year ago	- age above 18, - taking medication daily, - diagnosed with diabetes / high blood pressure/ musculoskeletal disease/ high cholesterol / cardiovascular disease
	Sample size	482 (from 1000 rep) patients	16 patients	500 patients
Data		database	voice record transcripts	database

Among the measurement tools (see Table 3). The MARS, INAS, BMQ, and AFF scales were borrowed from the ABC project (ABC Project Team, 2012). The AADQ questionnaire, originally designed for diabetes patients, was adapted in this dissertation research to apply to patients with any chronic disease. Consequently, the term 'diabetes' in the items was replaced with 'disease' to generalise its relevance. The AADQ scale is reported as unidimensional (Gregg et al., 2007).

3. Table: Tools for data collection in quantitative phases:

Phenomenon	Scale	Dimensions	Abbrev.	Nr. of items	Likert	Reference
MEDICATION ADHERENCE	Medication Adherence Report Scale	unidimensional	**MARS5**	5	1-5	Horne, 2003
	Beliefs About Medicines Questionnaire	Necessity	**BMQ_N**	5	1-5	Horne et al., 2013
		Concerns	**BMQ_C**	6		
	Intentional Non-Adherence Scale	Testing Treatment	**INAS_RI**	5	1-5	Weinman et al., 2018
LIMINALITY		Resisting Illness	**INAS_RI**	8		
	Acceptance and Action Diabetes Questionnaire	unidimensional	**AADQ**	11	1-7	Gregg et al., 2007
FINANCIAL AFFORDABILITY	Financial affordability	unidimensional	**AFF**	6	1-5	Schafheutle et al., 2010

Source: edited by the author

Ethical Considerations

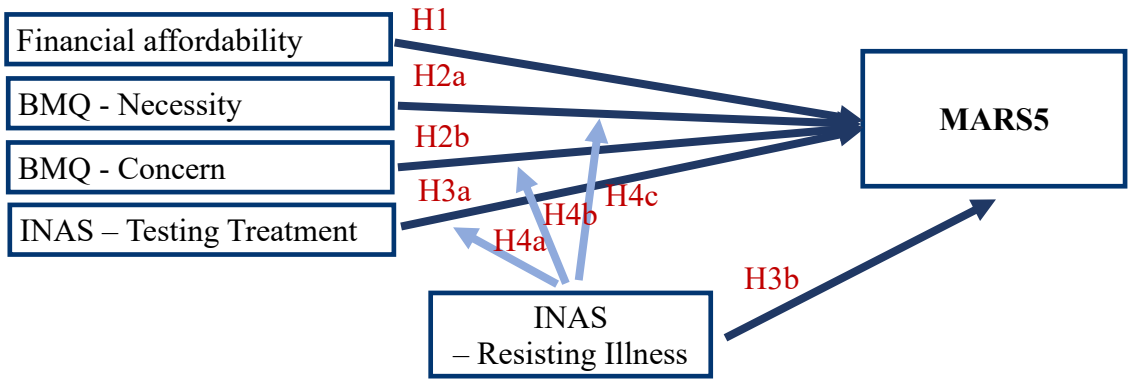
Ethical considerations are indispensable, especially during qualitative research, particularly in cases as sensitive as people's health and expenditures (Bailey, 2018). Ethical compliance was ensured through an independent entity. The *Research Ethics Committee* of the Corvinus University of Budapest offered this opportunity in Hungary. The Committee has released *ethical approval* for the primary research phase of this dissertation (nr: KRH/118/202).

5. Analysis and Results

5.1 Preliminary Quantitative Phase

The preliminary quantitative phase has employed INAS Resisting illness as a potential moderator in the model.

***2*. Figure: The research model of the preliminary study**



Source: edited by the author

All the constructs in the study were considered reliable for measuring the intended phenomena. The model possesses good convergent validity. The HTMT index for this research suggests that the constructs can be considered distinct.

Hypotheses and results:Hiba! A hivatkozási forrás nem található.

H1: Worst financial situation (affordability) has a positive impact on medical non-adherence

The hypothesis is confirmed ($t=6.500$, $p<0.001$), indicating that individuals facing financial challenges with their medication tend to adhere less to their treatment regimen. This is the most potent effect in the model ($f^2=0.2783$)

H2a: A stronger belief in the necessity of prescribed medications decreases non-adherence to the medication regimen.

The hypothesis is confirmed ($t=-2.2921$, $p=0.0221$), indicating that individuals with stronger beliefs about their medication necessity tend to be less non-adherent to their treatment regimen. This effect in the model is weak ($f^2=0.0222$)

H2b: Increased concerns about prescribed medications result in higher levels of non-adherent behaviour.

The hypothesis is confirmed (t=3.1393, p=0.0017), indicating that individuals with stronger concerns regarding their medication tend to be more non-adherent to their treatment regimen. This effect in the model is weak (f^2=0.0419)

H3a: Increased questioning of treatment results in a higher level of non-adherent behaviour

The hypothesis is confirmed (t=4.3392, p<0.0000), indicating that individuals more suspicious about the treatment tend to be more non-adherent to their treatment regimen. This effect in the model is weak (f^2=0.1376)

H3b: Increased level of illness rejection results in a higher level of non-adherent behaviour

This hypothesis is rejected. Although there is a significant direct effect (t=-2,2081 p=0.0275), this effect has the opposite direction as it was accepted based on the literature. The effect size is weak (f^2=0.0273).

H4a: Increased illness rejection negatively moderates the relationship between necessity beliefs and non-adherent behaviour.

This hypothesis is rejected. There is no significant moderation effect (t=0.2716, p=0.7860)

H4b: Increased illness rejection positively moderates the relationship between concern beliefs and non-adherent behaviour.

The hypothesis is confirmed at alpha=10% (t=1.8385, p=0.0663), indicating that individuals in liminality (resisting illness) are more affected by their illness concerns, which affect their non-adherent behaviour to their treatment regimen. This effect in the model is weak (f^2=0.0164).

H4c: Increased level of illness rejection positively moderates the relationship between treatment testing and non-adherent behaviour.

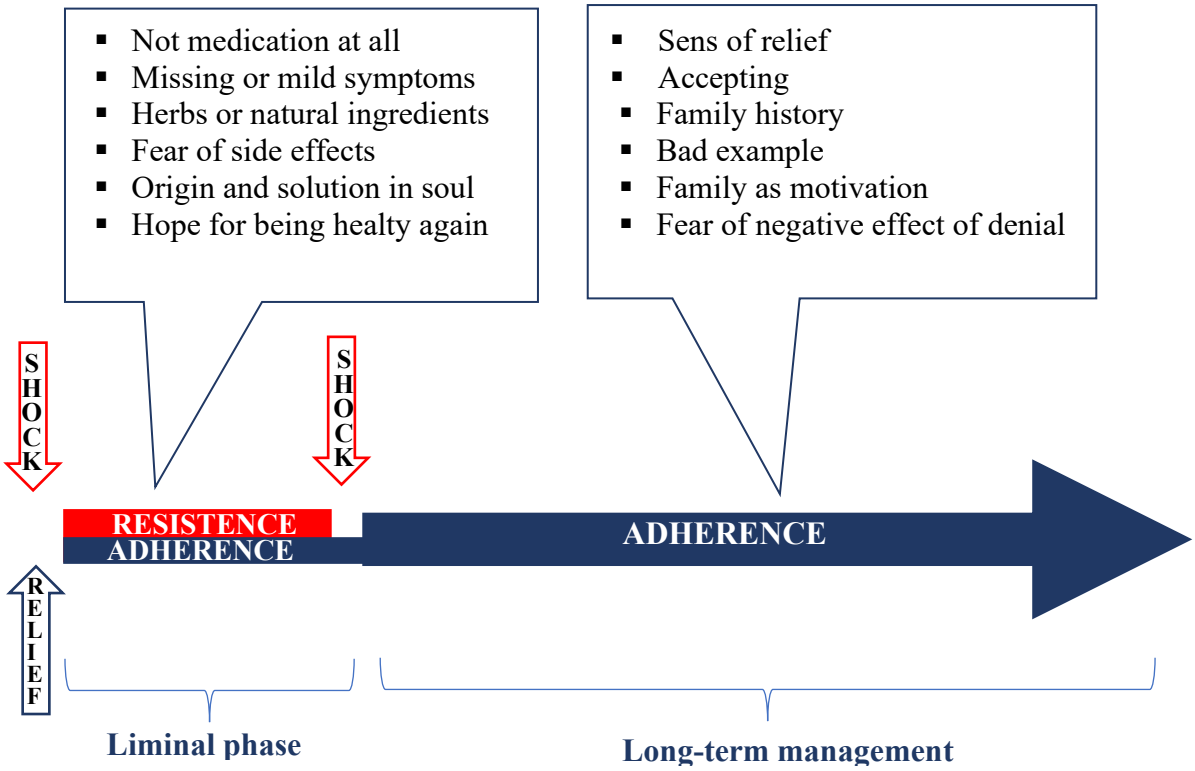
The hypothesis is rejected, although the path coefficient is significant (t=-2.1298, p=0.0334). However, the opposite is true since the moderation has a negative impact. This indicates that individuals more in liminality (resisting illness) are less affected by the testing treatment's effect on their non-adherent behaviour in their treatment regimen. This effect in the model is weak (f^2=0.0262).

In conclusion, while this preliminary research has shed light on the relationship between liminality (measured by Resisting Illness) and medication adherence behaviours, further studies with more targeted populations and other liminality measures are needed to provide more profound and nuanced insights into the dynamics of medication adherence.

5.2 Primary Qualitative Stage

The 3 figure illustrates the timeline of medication adherence based on the qualitative research interviews. The process is depicted as a continuum, from resisting to medication adherence. It maps out the phases and factors influencing patients' medication adherence behaviour from initial diagnosis through long-term management. The first liminal phase might be twofold. Initially, if the diagnosis is unexpected, patients may exhibit resistance to taking medication. Many times, a second shock, a significant health event, or increasing symptoms are needed to eventually push them towards accepting and adhering to their medication regimen. Some of the patients are adherent from the beginning with no denial phase. If the first reaction is a sense of relief since severe symptoms are experienced or diagnosis is expected, the patients would rather adhere to the treatment.

31. Figure: Timeline of Medication Adherence in Qualitative Research



source: edited by author

The qualitative research explores the evolving nature of medication adherence among patients diagnosed with chronic conditions, highlighting significant differences between the initial, liminal phase and long-term management.

In the initial (liminal) phase, patients' first reaction to a diagnosis might be shock or resistance, particularly if they have no severe symptoms or prior health issues. This period is characterised by denial and a reluctance to start medication. Many patients do not immediately understand the seriousness of their condition if symptoms are mild or absent. The necessity of the treatment is not obvious under this condition. Thus, this initial phase is rather characterised by non-adherence and a conscious decision to avoid medication than the long-term, chronic phase, even if some of the patients are accepting from the very beginning of their disease history.

For non-adherent beginners, a second shock might be the gateway to medication adherence. Significant health events often act as wake-up calls, pushing patients towards acceptance and medication adherence.

In long-term management, patients come to terms with their condition and recognise the necessity of medication over time. They establish routines that integrate medication into their daily lives. Patients become more engaged in their treatment plans and consult their doctors for adjustments. This proactive approach helps them manage their condition more effectively.

The differences between the initial, liminal phase and long-term management in medication adherence highlight the importance of considering time since diagnosis in understanding medication adherence levels. Investigating these temporal dynamics can help healthcare providers better support patients in transitioning from initial resistance to long-term medication adherence, ultimately improving health outcomes.

5.3 Primary Quantitative Stage

While building the primary quantitative model, the AADQ scale was selected for this role because it measures the level of acceptance of having a disease. The literature review indicated that the AADQ scale is unidimensional. Therefore, the initial step of the research involved applying the AADQ scale as a potential moderator in the model introduced during the preliminary phase. Based on these low AVE metric and item loading values and in light of the relevant literature, the AADQ scale may have more than one

dimension, which could explain the observed deficiencies in the model's performance (Hair et al., 2010). An exploratory factor analysis and confirmatory factor analysis identified a three-factor structure (see Table 4).

4. Table: Factor Structure and Loadings of AADQ Scale

FACTOR	Item	Loadings
Disease Denial	10. I avoid thinking about what the disease can do to me.	0,784
	8. I often deny to myself what the disease can do to my body.	0,696
	11. I avoid thinking about the disease because someone I knew died from the same disease.	0,677
	3. I do not take care of my disease because it reminds me that I have the disease.	0,635
Liminal Disengagement	7. I avoid stress or try to get rid of it by eating what I know I shouldn't eat.	0,828
	2. I have thoughts and feelings about having this disease that are distressing.	0,720
	4. I eat things I shouldn't eat when the urge to eat them is overwhelming.	0,622
	6. I avoid taking or forget to take my medication because it reminds me that I have disease.	0,531
	9. I don't exercise regularly because it reminds me that I have the disease.	0,459
Controlled Illness Consciousness	5. When I have an upsetting feeling or thought about my disease, I try to get rid of that feeling or thought.	0,791
	1. I try to avoid reminders of my disease.	0,523

source: edited by author

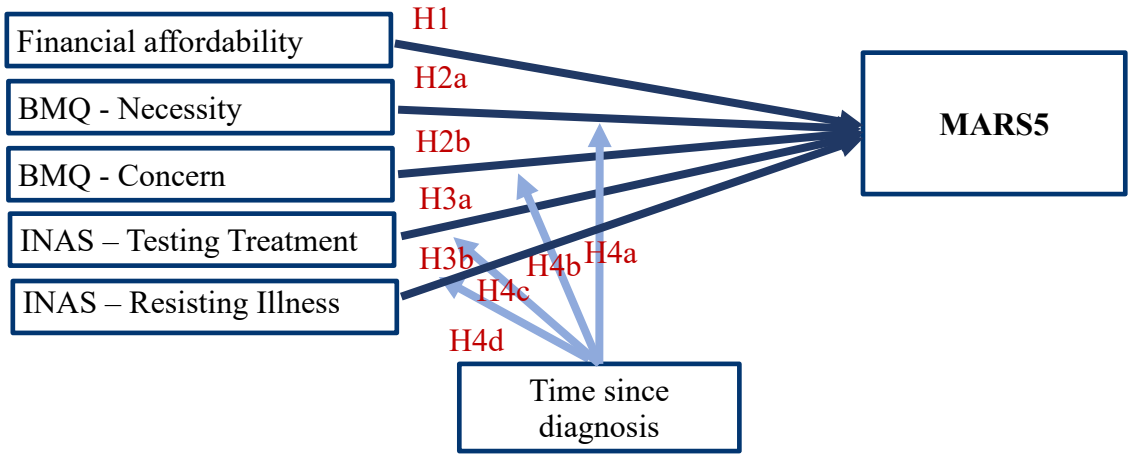
The three-factor AADQ structure was further integrated into a tailored PLS-SEM model. The Liminal Disengagement and Disease Denial dimensions were employed. Given its content similar to the INAS Resisting Illness, the Disease Denial Dimension was incorporated to capture the impact of liminality as a moderator effectively. Due to poor fit, convergent validity, and reliability, another moderator was introduced.

The AADQ scale was not proven reliable enough through the modelling procedure. The original starting point, the Intentional Non-Adherence Scale (INAS), was further employed as an illness acceptance measurement tool while modelling. Although several publications reference the INAS scale with various factor structures, none use a scale validation method. Therefore, the INAS scale was further investigated before initiating the primary modelling.

The dissertation uses the original factor dimensions (see **Hiba! A hivatkozási forrás nem található.**) of intentional non-adherence, such as Resisting Illness and Testing Treatment. This structure was validated by a Confirmatory Factor Analysis, as detailed below. The model fit is good enough based on the most important fit measures, so the scale was further employed.

A new variable, based on the qualitative findings, was introduced to the model to develop it further. As explained in qualitative findings, the time since diagnosis captures the liminal phase in the primary quantitative model.

4. Figure: The Research Model of the Primary Study



source: edited by author

All the constructs in the primary research can be considered reliable for measuring the intended phenomena: non-adherent medical behaviour (MARS5), financial affordability (AFF), concerns beliefs (BMQ_C), necessity beliefs (BMQ_N), testing-treatment (INAS_TT), and resisting illness (INAS_RI). It is concluded that the model realises good convergent validity. The constructs can be considered distinct, but the results concerning the two INAS scales might have limitations.

Hypotheses and results:Hiba! A hivatkozási forrás nem található.

H1: Worst financial situation (affordability) has a positive impact on medical non-adherence

The hypothesis is confirmed ($t=4.582$, $p<0.001$), indicating that individuals facing financial challenges with their medication tend to adhere less to their treatment regimen. This is the strongest effect in the model ($f^2=0.123$)

H2a: A stronger belief in the necessity of prescribed medications decreases non-adherence to the medication regimen.

The hypothesis is rejected (t=-0.439, p=0.661); beliefs about medication necessity have no proven effect on the level of non-adherence.

H2b: Increased concerns about prescribed medications result in higher levels of non-adherent behaviour.

The hypothesis is rejected (t=-0.194, p=0.846); more substantial concerns regarding the medication have no proven effect on the level of non-adherence.

H3a: Increased questioning of treatment results in a higher level of non-adherent behaviour

The hypothesis is confirmed at alpha=10% (t=1.898, p=0.058), indicating that patients who are more suspicious about their treatment tend to be more non-adherent to their treatment regimen. This effect in the model is weak (f^2=0.020)

H3b: Increased level of illness rejection results in a higher level of non-adherent behaviour

This hypothesis is rejected. Rejecting illness has no significant direct effect (t=-0,569, p=0.569) on the level of non-adherence.

H4a: The time since diagnosis positively moderates the effect of necessity beliefs on non-adherent behaviour.

This hypothesis is confirmed. There is a significant, positive moderation effect (t=3.1206, p=0.002), but the effect is weak (f^2=0.036). This indicates that patients who have been aware of their disease for a longer time have a more substantial decreasing effect of necessity beliefs on non-adherent behaviour compared to those who have a shorter disease history.

H4b: The time since diagnosis negatively moderates the effect of concern beliefs on non-adherent behaviour.

The hypothesis is rejected (t=-0.307, p=0.759), and there is no moderation effect.

H4c: The time since diagnosis negatively moderates the relationship of treatment testing on non-adherent behaviour.

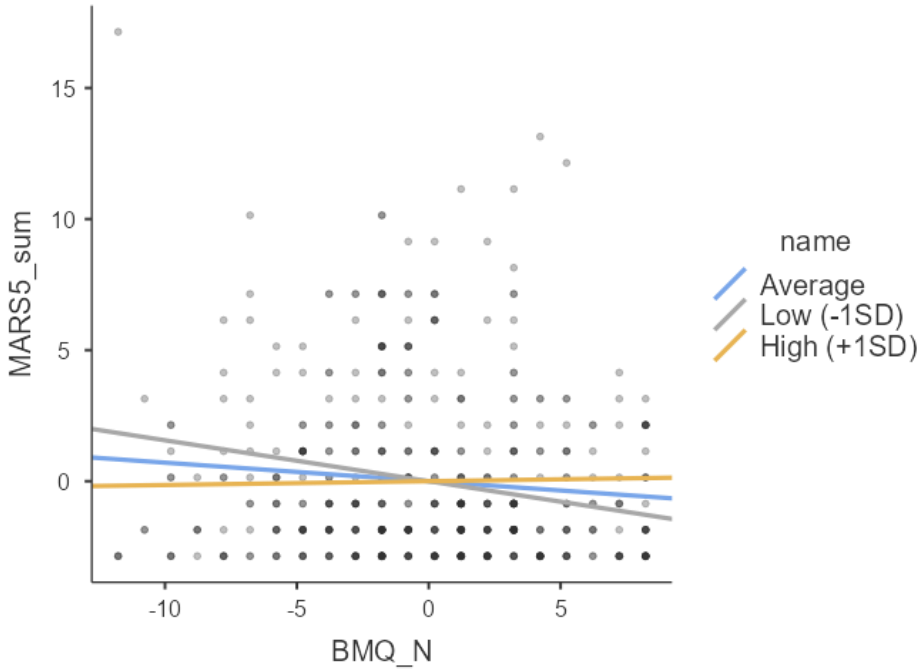
The hypothesis is confirmed (t=-1.772, p=0.0334) that there is a weak negative moderation effect of time (f^2=0,011). This indicates that patients who have been aware of their disease for a longer time have a stronger decreasing effect of necessity beliefs on non-adherent behaviour compared to those who have a shorter disease history.

H4d: The time since diagnosis negatively moderates the effect of resisting illness on non-adherent behaviour.

The hypothesis is rejected (t=0,768, p=0.443), and no moderation effect is proven.

To gain a deeper understanding of the effect of necessity beliefs on non-adherent behaviour and to analyse its non-significant direct effect, it is crucial to consider how time since diagnosis significantly and positively moderates this relationship Closer to diagnosis, the necessity beliefs have a more substantial protecting role against non-adherence. As a conclusion closer to the diagnosis, the impact of necessity beliefs on non-adherence is more pronounced, but this effect disappears over time (see Figure 5).

52. Figure: Slope Analysis of the Moderating Effect of Time



Source: JAMOVI output

53. Table: Summary Table of Preliminary and Primary Quantitative Model

H		PATH		HYPOTHESIS		DECISION	
		PRELIMINARY (mod: INAS Resisting Illness)	PRIMARY (mod: Time since diagnosis)	PRELIMINARY	PRIMARY	PRELIMINARY	PRIMARY
DIRECT EFFECTS	**H1**	**AFF-> MARS5**		Worst financial situation (affordability) has a **positive** impact on medical non-adherence		**CONFIRMED**	**CONFIRMED**
	H2a	**BMQ_N_> MARS5**		A stronger belief in the necessity of prescribed medications **decreases** non-adherence to the medication regimen.		CONFIRMED	REJECTED
	H2b	**BMQ_C -> MARS5**		Increased concerns about prescribed medications result in **higher** levels of non-adherent behaviour.		CONFIRMED	REJECTED
	H3a	**INAS_TT -> MARS5**		Increased questioning of treatment results in a **higher** level of non-adherent behaviour		**CONFIRMED**	**CONFIRMED**
	H3b	**INAS_RI-> MARS5**		Increased level of illness rejection results in a **higher** level of non-adherent behaviour.		**REJECTED (sig but reverse)**	**REJECTED**
MODERATING EFFECTS	**H4a**	**BMQ_N**xINAS_RI -> MARS5	**BMQ_N**_Xyears -> MARS	Increased illness rejection **negatively** moderates the relationship between necessity beliefs and non-adherent behaviour.	The time since diagnosis **positively** moderates the effect of necessity beliefs on non-adherent behaviour.	**CONFIRMED**	**CONFIRMED**
	H4b	**BMQ_C**xINAS_RI -> MARS5	**BMQ_C**_Xyears -> MARS	Increased illness rejection **positively** moderates the relationship between concern beliefs and non-adherent behaviour.	The time since diagnosis **negatively** moderates the effect of concern beliefs on non-adherent behaviour.	**REJECTED**	**REJECTED**
	H4c	**INAS_TT**xINAS_RI -> MARS5	**INAS_TT**_Xyears -> MARS	Increased level of illness rejection **positively** moderates the relationship between treatment testing and non-adherent behaviour.	The time since diagnosis **negatively** moderates the relationship between treatment testing and non-adherent behaviour.	REJECTED (sig but reverse)	CONFIRMED
	H4d	-	**INAS_RI**_Xyears -> MARS	-	The time since diagnosis **negatively** moderates the effect of resisting illness on non-adherent behaviour.	-	REJECTED

source: edited by author

6. Interpretations and Conclusions

6.1 Theoretical Contributions

Measurement Tool Results

The Acceptance and Action Diabetes Questionnaire (AADQ), initially reported as unidimensional (Gregg et al., 2007), has revealed a more complex structure in this research. The AADQ scale was applied in general chronic disease wording instead of diabetes focus, and it was determined to have a three-dimensional factor structure through exploratory and confirmatory factor analyses. This result enhances understanding of patient medication adherence behaviours and psychological processes underlying disease acceptance. The three identified dimensions are: ‘Disease Denial’, ‘Liminal Disengagement’, and ‘Controlled Illness Consciousness’.

Validation of the Intentional Non-Adherence Scale (INAS) through Confirmatory Factor Analysis (CFA) based on the original framework (Weinman et al., 2018) not only confirms the INAS's reliability and structural integrity but also reinforces its applicability in assessing intentional non-adherence behaviours among patients with chronic illnesses.

Direct Effects on Non-adherence

Financial constraints significantly impact non-adherent behaviour among patients with chronic diseases, underscored by the role of economic factors in patient medication adherence (ABC Project Team, 2012). Financial burdens can limit patients' ability to buy necessary medications, attend regular follow-up visits, or maintain a consistent treatment regimen, directly leading to non-adherence (Ganguli & Thakore, 2021; ABC Project Team, 2012; McHorney & Spain, 2011). This result shifts the focus from purely medical or psychological models of non-adherence to include socio-economic factors.

The intentional Non-Adherence Scale (INAS) and the Beliefs about Medicines Questionnaire (BMQ) have different impacts on non-adherent behaviours since the INAS is a stronger predictor of non-adherence than the BMQ. The INAS focuses on the intentional aspects of non-adherence, which suggests that non-adherence is often a conscious decision rather than merely a passive response influenced by beliefs. This finding challenges the traditional emphasis on patient beliefs (Horne, 2003) and underscores the importance of addressing patient intentions in medication adherence interventions. This result urges a shift

in medication adherence models from a belief-centric framework to those that incorporate intentional behaviours.

Moderating Effects Capturing Liminality

"Resisting Illness" has a complex role in the context of medication adherence. Although the direct effect of resisting illness on non-adherence is ambivalent in the two models, its moderating effects are significant, decreasing the impact of "Testing Treatment" on non-adherence and strengthening the effect of "Concern" on non-adherence. This indicates that individuals who deny their illness are less likely to be non-adherent due to questioning their treatment. On the contrary, resisting illness intensifies the effect of concerns about medication on non-adherence. This gave evidence that patient resistance to illness does not operate in isolation but interacts with other psychological factors to influence behaviour.

The moderating effects of time elapsed since diagnosis on non-adherence behaviours mainly focus on how these effects shape the impact of 'Testing Treatment' and the acceptance of treatment necessity. The findings highlight a dynamic aspect of patient medication adherence behaviour over time, showing a decrease in the influence of testing treatments on non-adherence while an increase in the acceptance of treatment necessity significantly mitigates non-adherence. As more time passes since a patient's diagnosis, the likelihood of engaging in testing treatment behaviours decreases. This indicates that over time, patients develop a deeper understanding of the importance of their treatment, leading to better medication adherence. The decreasing effect of necessity on non-adherence is significant closer to the diagnosis; as time progresses, this effect is eliminated. This is partially in line with Schüz et al., 2011 as time influences medication adherence indirectly by altering patients' beliefs and attitudes towards their treatment in case of necessity, but concern beliefs are not proven by primary quantitative research.

Path Toward Medication Adherence

The dissertation explores dual pathways to medication adherence. The first pathway involves patients who are naturally adherent from the beginning, either due to their nature or a deep understanding of their condition and the necessity of treatment. The second pathway involves those who initially resist treatment (Huyard et al., 2016) but become adherent following a significant health crisis or stronger symptoms. This reshapes their perception of their illness and the necessity of the treatment. It highlights how shock events can transform

patient behaviour from non-adherence to adherence, which helps understand patient psychology.

There is a 'threshold' of medication denial represented by the initial resistance to starting any medication regimen. Overcoming this threshold is a turning point; patients tend to accept additional medications more readily; therefore, the initial resistance to medication is a pivotal barrier that must be crossed only once.

6.2 Practical Implications

Addressing patients' beliefs about medications early in their treatment is essential to ensuring better medication adherence (Unni et al., 2015). To boost medication adherence, programs intended for this purpose should begin at the onset of therapy. Early implementation can help improve the necessity belief (Petrilla et al., 2005). Engaging patients with clear but empathetic communication about their condition and the necessary treatments contributes to non-adherence. Educating patients about the consequences of non-adherence and the benefits of staying on the prescribed regimen during this time is crucial. To do so, they must be trained (White et al., 2013).

The results underscore the importance of influencing patients' rational understanding of their treatment. Knowledge expansion programs explain how medications work. These programs might be supported by marketing communication tools that build on patient stories to make the results of medication adherence and non-adherence more lifelike (Hackley et al., 2021) and foster identification.

It is crucial to provide additional support for patients experiencing financial difficulties. This might include access to financial counselling and assistance programs to ensure that financial barriers do not hinder medication adherence. Policies that reduce the economic burden of chronic disease management are also needed.

6.3 Limitations

In the dissertation, while providing insights into medication adherence, several limitations should be considered.

The study employed a cross-sectional design, which limits the ability to infer causality. The data was self-reported, which may lead to an overestimation of medication adherence rates. Participants may have reported higher medication adherence due to recall bias or social

desirability bias. Most of the interviewees were not in their liminal stage during the data collection; there is a chance for retrospective bias.

The scales used to measure the concept of liminality, particularly the INAS Resisting Illness and AADQ, raised certain methodological concerns that may affect the reliability and validity of the results.

While the multimorbid nature of the sample aids in generalising the findings, it also overlooks the specific characteristics of individual disease groups. The sample consisted exclusively of Hungarian patients. Data was collected online during the quantitative research phases, which restricted participation.

6.4 Further Research Recommendations

Future research should employ longitudinal designs to track changes in medication adherence over time. Incorporating measures of how patients initially perceive their illness severity and symptom strength could provide context for understanding medication adherence trajectories. Examining specific disease groups separately would help identify unique medication adherence patterns and challenges that may vary between different diseases. There is a need to develop a stable disease acceptance and/or denial scale. This scale should be designed to measure acceptance across various chronic conditions and cultural settings accurately.

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