

Relationship between Illness Severity, Medication adherence and Post-Traumatic Growth in Chronic Patients

Iram Naz^{*1}, Isha Maan², Kinza Akhtar³, Rimsha Rashid⁴, Javeria Jabbar⁵

Abstract

This study explored the impact of illness severity on medication adherence and post-traumatic growth (PTG). Chronic illnesses pose a series of psychological and physical challenges for patients that can affect their adherence to treatment and adaptation to trauma. A quantitative cross-sectional design was used to collect data from 400 chronic patients who were sampled using purposive sampling technique from healthcare institutions in district Gujrat. Data were collected using the Adaptive Illness Intrusiveness Ratings Scale (IIRS), Medication Adherence Report Scale-5 (MARS-5), and Post-Traumatic Growth Inventory-Short Form (PTGI-SF). Measures of central tendency, Pearson correlation, regression, and mediation analysis were performed. Results revealed that illness severity positively correlated with medication adherence and post-traumatic growth. The correlation coefficient between medication adherence and PTG was positive, indicating the significance of adherence to medication in psychological adjustment and growth. Moreover, mediation analysis further established that adherence to medication played an intermediary role in the association between illness severity and post-traumatic growth. The present study suggests that adherence to prescribed medications not only plays a significant role in the health outcomes of chronic illnesses but is also critical for positive psychological adaptation in chronic patients.

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Corresponding Author*

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Introduction:

Chronic illnesses are long-term medical problems that are frequently incurable and require continuous care. The World Health Organization defines chronic diseases, often known as non-communicable diseases (NCDs), as long-lasting ailments that typically proceed slowly (WHO, 2023). Diabetes, heart disease, cancer, and long-term respiratory conditions are common examples that have a substantial influence on people's everyday lives and physical functioning (Centers for Disease Control and Prevention [CDC], 2022). These illnesses frequently necessitate ongoing medical care, lifestyle changes, and compliance with long-term treatment plans. In contrast to acute illnesses, individuals with chronic diseases must adjust to

¹ PhD Psychology, Assistant Professor, Department of Psychology, University of Gujrat.

<https://orcid.org/0000-0003-4116-7619>. iram.naz@uog.edu.pk

² MS Scholar, Department of Psychology, University of Gujrat. isharajpoot2606@gmail.com

³ MS Scholar, Department of Psychology, University of Gujrat. kinzaakhtar1318@gmail.com

⁴ MS Scholar, Department of Psychology, University of Gujrat. rimshah304@gmail.com

⁵ BS Scholar, Department of Psychology, University of Gujrat. javeria.jabbar02@gmail.com

ongoing healthcare needs, functional limits, and persistent symptoms (Stanton et al., 2007). These illnesses frequently necessitate ongoing medical care, lifestyle changes, and compliance with long-term treatment plans. In contrast to acute illnesses, individuals with chronic diseases must adjust to ongoing healthcare needs, functional limits, and persistent symptoms (Stanton et al., 2007). One of the main causes of morbidity and mortality in the globe is chronic illness. According to the World Health Organization, non-communicable illnesses have a substantial influence on public health since they cause around 74% of all deaths worldwide (WHO, 2023). Due to a lack of healthcare resources and rising exposure to risk factors like sedentary lifestyles and unhealthy eating habits, low- and middle-income nations—including Pakistan—bear a disproportionate amount of this burden (GBD 2019 Diseases and Injuries Collaborators, 2020).

Chronic illnesses have a significant impact on disability, lower quality of life, and higher healthcare expenses in addition to mortality. Long hospital stays, frequent doctor visits, and financial hardship are common among patients, all of which have an impact on people and healthcare systems (Prince et al., 2015). The necessity for efficient management techniques and psychological assistance for people with chronic illnesses is highlighted by this mounting burden. There are psychological as well as physical aspects to living with a chronic illness. Emotional difficulties like stress, worry, sadness, and feelings of uncertainty about the future are common among patients. According to research, a chronic illness can act as a constant source of stress, upsetting a person's feeling of control and normalcy (Taylor, 2018).

Long-Term Illness Management's Significance:

Sustained patient participation in treatment regimens, including medication adherence and self-care practices, is crucial for the effective management of chronic illness. Controlling symptoms, avoiding complications, and enhancing general quality of life are the goals of long-term disease treatment (Sabate, 2003). Medication adherence, in particular, plays a crucial role in achieving positive health outcomes. However, maintaining adherence over extended periods can be challenging due to factors such as treatment complexity, side effects, and psychological burden (Jimmy & Jose, 2011). Poor adherence can lead to disease progression, increased hospitalization, and higher mortality rates. Given these difficulties, it is critical to comprehend the elements—such as psychological adaptability and coping strategies—that affect patients' capacity to manage their condition. This emphasizes the significance of examining both good psychological changes, like post-traumatic growth, and negative outcomes, like discomfort, in people with chronic illness.

Illness Severity in Chronic Conditions:

The degree to which a sickness impairs a person's physical well-being and ability to function is referred to as illness severity. There are two ways to understand it: perceived severity, which relates to a person's subjective assessment of how serious their condition is, and clinical severity, which is based on objective medical indications including symptoms, disease stage, and test results (Leventhal et al., 2003). Illness severity significantly affects daily functioning, as higher severity is associated with greater physical limitations, reduced mobility, and decreased ability to perform daily activities (Stanton et al., 2007). It can also increase

emotional distress, including anxiety and depression, as patients may experience fear, uncertainty, and reduced sense of control over their health (Taylor, 2018).

Medication Adherence

The degree to which patients take their medications as directed in terms of dosage, timing, and frequency is known as medication adherence. Adherence is described by the World Health Organization as "the degree to which a person's behavior corresponds with agreed recommendations from a healthcare provider" (Sabate, 2003). According to the Health Belief Model, people's views of treatment barriers, advantages, severity, and susceptibility have an impact on adherence (Rosenstock, 1974). According to Leventhal et al. (2003), the Self-Regulation Model suggests that patients develop cognitive representations of their illness, such as severity, control, and consequences, which direct coping strategies like taking medication. There are several factors that affect medication adherence. Negative thoughts and low perceived necessity frequently lower adherence, while patient-related factors like motivation, recall, health literacy, and beliefs about medications play a significant influence (Horne et al., 2013). Disease-related factors, particularly the severity of the illness, might either boost adherence because of perceived threat or decrease it because of treatment load and exhaustion (Jimmy & Jose, 2011). Adherence is also greatly impacted by healthcare system elements as cost, support, communication, and access to care; inadequate systems are associated with poorer adherence rates (Sabaté, 2003). There has been conflicting research on the connection between drug adherence and the severity of sickness. While some research reveal lower adherence due to treatment burden and psychological exhaustion, others demonstrate that higher severity enhances adherence due to increased perceived risk (Horne et al., 2013; Jimmy & Jose, 2011). While poor medication adherence increases hospitalization rates, disease progression, and mortality in chronic illnesses, medication adherence is consistently linked to better health outcomes (Sabaté, 2003).

Relationship between Post- Traumatic Growth and Medication Adherence:

Positive psychological improvements that follow the struggle with extremely difficult life conditions are referred to as post-traumatic growth (PTG). The idea was created by Richard Tedeschi and Lawrence Calhoun, who suggested that meaning-making and cognitive processing could help people grow following trauma (Tedeschi & Calhoun, 2004). According to Tedeschi and Calhoun (2004), PTG is commonly manifested in four major domains: enhanced spiritual or existential growth, improved connections with others, increased personal strength, and a greater enjoyment of life.

Long-term disease treatment is frequently perceived as a constant source of stress or "chronic trauma" in those with chronic illness. Patients deal with symptoms, treatment requirements, and future uncertainties on a regular basis. However, some people may experience PTG through coping and adaptation as they reframe their experience of disease and strengthen their sense of purpose and resilience. By enhancing physical stability and lowering disease complications, medication adherence may indirectly enhance PTG by freeing patients to concentrate more on psychological adjustment and meaning-making rather than crisis management. On the other hand, inadequate adherence may worsen stress and health, reducing the mental and emotional capability required for development. Therefore, health stability,

coping mechanisms, and how chronic patients perceive their condition may all have an indirect relationship with adherence and PTG.

Connecting the Variables:

In the setting of chronic illness, there is a complicated and interdependent interaction between the severity of the illness, medication adherence, and post-traumatic growth (PTG).

Medication adherence may be impacted by the severity of the illness in two ways. Because of the perceived threat and necessity for treatment, higher severity may promote adherence; nevertheless, treatment burden, weariness, and complexity may decrease adherence (Jimmy & Jose, 2011).

Health behavior models state that adherence behaviors are largely influenced by people's cognitive assessment of the severity of their condition (Horne et al., 2013).

Psychological distress, including anxiety and sadness, is also linked to the severity of illness. However, when people process their sickness and make sense of it, chronic illness can also serve as a catalyst for post-traumatic growth (Tedeschi & Calhoun, 2004). As a result, while increased distress may initially make people more vulnerable, it can also foster growth.

Adherence to medication improves health outcomes and disease control, which may lessen psychological and physical strain. By enabling people to concentrate on meaning reconstruction rather than crisis management, this enhanced stability can encourage adaptive coping mechanisms

And indirectly support PTG (Sabate, 2003). In general, these connections may involve moderation effects (e.g., sickness perception impacting the severity–adherence link) and mediation effects (e.g., adherence mediating the relationship between illness severity and psychological consequences).

Research Gap

While earlier studies have looked at post-traumatic growth, medication adherence, and illness severity independently, few have combined all three factors into a unified conceptual model, especially in population with chronic illnesses. Without examining how medical and psychological processes interact concurrently, the majority of current research concentrates on either adherence behaviors or psychological outcomes separately (Horne et al., 2013; Tedeschi & Calhoun, 2004).

Furthermore, PTG research has mostly concentrated on cancer and trauma populations, paying relatively less attention to more general chronic illness groups where stress is continuous rather than event-based. Additionally, there are few research looking at medication adherence as a possible psychological growth facilitator. This reveals a substantial knowledge gap regarding the joint effects of behavioural (adherence) and clinical (severity) factors on psychological adaptation (Jimmy & Jose, 2011; Sabaté, 2003).

Literature Review:

Chronic Illness and its effects on the mind:

People with chronic illnesses bear a long-term burden, which frequently results in a lower quality of life and severe psychological suffering. Because chronic diseases are ongoing stressors that impact mental health, patients frequently suffer stress, depression, and emotional strain connected to their illness (Stanton et al., 2007; Taylor, 2018)

Conceptualization

According to (Leventhal et al., 2003), coping behavior is influenced by both subjective assessments of sickness severity and objective clinical indications, such as symptoms and disease stage.

Empirical Results:

Although some patients exhibit psychological adaptation even in severe conditions, higher illness severity is typically linked to increased psychological discomfort and decreased quality of life (Stanton et al., 2007).

Factors Influencing Compliance:

Patient beliefs, cognitive variables, the severity of the illness, and assistance from the healthcare system all have an impact on adherence. Adherence is decreased by unfavorable attitudes and limited access to healthcare (Horne et al., 2013; Sabate, 2003).

Empirical Results:

Research on the relationship between severity and adherence reveals conflicting results: severity may increase adherence because of perceived danger or decrease it because of treatment load. According to Jimmy and Jose (2011), poor adherence is frequently associated with lower health outcomes.

Post-Traumatic Growth

Structure of theory:

PTG, which was created by Richard Tedeschi and Lawrence Calhoun, explains how cognitive processing and meaning-making lead to positive psychological transformation after adversity (Tedeschi & Calhoun, 2004).

PTG in Long-Term Illness:

Patients with chronic illnesses, such as cancer and persistent pain, have been found to have PTG. Coping mechanisms, social support, and the impression of sickness all have an impact (Tedeschi & Calhoun, 2004).

Degree of Illness and Medication Compliance:

Higher severity may either increase adherence because of a fear of problems or decrease it because of treatment load and weariness, according to conflicting findings (Jimmy & Jose, 2011; Horne et al., 2013).

PTG and Illness Severity:

In addition to causing discomfort, severe sickness can promote PTG through processes of meaning-making. According to some research, growth may be best supported by moderate severity (Tedeschi & Calhoun, 2004).

PTG and Medication Adherence:

There is not much research. However, poor adherence may impede coping and growth, whereas adherence may indirectly assist PTG by enabling psychological adjustment and enhancing health stability (Sabaté, 2003).

An Integrated Viewpoint:

The three variables could interact in the following ways:

Mediation: The association between the severity of the illness and psychological effects may be mediated by adherence.

Moderation: Adherence may affect how strongly severity and PTG are related. This serves as the current study's conceptual foundation.

Rationale of the study:

Rarely does current research include PTG, medication adherence, and illness severity into a single model. The majority of research looks at these factors independently and concentrates more on clinical results than psychological development in people with chronic illnesses. By examining their combined associations in chronic patients, this work fills this gap (Horne et al., 2013; Tedeschi & Calhoun, 2004).

Objectives of the Study:

- To examine the relationship between illness severity and medication adherence
- To explore the association between illness severity and PTG
- To investigate the role of medication adherence in in PTG

Research Questions / Hypotheses

- Is illness severity significantly related to medication adherence?
- Does illness severity predict post-traumatic growth?
- Does medication adherence mediate/moderate this relationship?

Methodology:**Study design and Setting:**

In order to investigate the connection between posttraumatic growth, medication adherence, and illness severity in chronic patients, this study used a quantitative, correlational research methodology. A technique for determining the link between two or more variables without modification is known as correlational research (Putri et al., 2025). To gather information from participants at one particular moment in time, a cross-sectional research methodology was employed. Cross-sectional studies are classified as observational research designs since they evaluate both exposure and outcome variables at the same time (Setia, 2016). The current investigation was carried out in Punjab healthcare facilities that treat individuals with long-term conditions. Patients with diabetes, hypertension, and other long-term chronic illnesses were chosen as participants.

Study Population:

A population is an essential component of research technique and is defined as a collection of people with similar characteristics within a certain geographic or institutional location (Martínez-Mesa et al., 2016). Predefined criteria that are in line with the study's goals are used to define the

Target population (Alvi, 2016). Male and female patients with current diagnoses of chronic illnesses made up the study's target population.

Sampling Technique:

Purposive sampling, a kind of non-probability sampling approach in which participants are chosen based on certain characteristics pertinent to the study's goals, was used in this investigation. Participants were chosen according to their willingness and availability. Practical factors like time limits, accessibility and voluntary participation led to the adoption of this strategy.

Sample Size:

The number of people chosen from an area to represent that group and enable statistical generalization is referred to as the sample size (Field, 2018). Four hundred (400) chronic patients who were selected from different healthcare facilities made up the sample. This sample size was deemed sufficient to investigate the association among people with chronic diseases between the severity of their illness, medication adherence, and posttraumatic growth.

To guarantee gender representation, both male and female volunteers were included. The sample size was established based on the availability of chronic patients visiting hospitals and outpatient clinics throughout the data collecting period, and patients who satisfied the predetermined inclusion criteria were included through purposeful sampling.

Criteria for Inclusion and Exclusion:

Diagnosed with a chronic illness that has persisted for at least six months thirty years of age or older currently receiving medical care and taking prescription drugs capable of comprehending and answering self-report surveys willing to give informed consent and take part voluntarily are included in this study while who have acute or terminal illness, severe mental illnesses that may influence reactions, such as psychosis or severe cognitive impairment,

Having a medical emergency or being admitted to the hospital while the data was being collected

Incomplete or incorrectly completed questionnaires are exclude from this study.

Data collection tools:

a) Consent Form:

To guarantee ethical participation, a written informed consent form was utilized. The goal of the study, voluntary involvement, confidentiality, and the freedom to discontinue participation at any moment without consequence were all explained to the participants.

b) Demographic form:

Age, gender, marital status, educational attainment, type and duration of chronic illness, and length of medication use were all gathered using a self-report demographic questionnaire. Descriptive statistics were used to evaluate demographic data.

c) Adaptive Illness Intrusiveness Ratings Scale (IIRS)

The Adaptive Illness Intrusiveness Ratings Scale (IIRS), created by Devins et al. (1983), was used to measure the severity of the illness. The measure evaluates how much a chronic illness and its treatment affect one's health, career, relationships, leisure activities, and personal growth. Higher scores indicate more intrusive sickness. Items are assessed on a 7-point Likert scale from 1 (not very much) to 7 (very much). With Cronbach's alpha values typically surpassing .80, the scale has shown strong internal consistency (Devins, 2010). In this investigation, the total score was utilized.

d) Medication Adherence Report Scale-5 (MARS-5)

The Medication Adherence Report Scale-5 (MARS-5), which was developed by Horne et al. (1999) and later modified by Chan et al. (2019), was used to measure medication adherence. Higher scores indicate better medication adherence. The scale consists of five items that are assessed on a 5-point Likert scale from 1 (very often) to 5 (never). Cronbach's alpha scores for the MARS-5 range from .67 to .89, indicating satisfactory to good internal consistency (Chan et al., 2019). The sum of all the items was used to determine the overall score.

e) Posttraumatic Growth Inventory – Short Form (PTGI-SF):

The Posttraumatic Growth Inventory–Short Form (PTGI-SF), created by Cann et al. (2010), was used to measure posttraumatic growth. The scale is a shortened form of Tedeschi and Calhoun's (1996) Posttraumatic Growth Inventory. It assesses positive psychological changes in five dimensions after difficult life situations, such as chronic disease. On a Likert scale, items are scored from 0 (did not experience this change) to 5 (experienced this change to a very large degree). With Cronbach's alpha values more than .80, the PTGI-SF has demonstrated strong internal consistency (Cann et al., 2010). In this investigation, the total score was utilized.

Procedure:

A cross-sectional survey approach was used to gather information from patients with chronic medical conditions. Prior to participation, signed informed consent was obtained after participants were made aware of the study's aims. Confidentiality was guaranteed, and participation was entirely voluntary. The demographic form, IIRS, MARS-5, and PTGI-SF were filled out by eligible individuals. Completing the paper-based and online questionnaires took about 15 to 20 minutes. Statistical packages were used to analyze the data. Descriptive statistics were calculated to present the demographics and variables involved in the study. The predictors of illness severity and medication adherence were evaluated using regression analysis. Mediation analysis was done to establish whether medication adherence acted as a mediator between illness severity and posttraumatic growth.

Ethical consideration:

The investigation was conducted with strict adherence to ethical considerations. The goal of the study, voluntary participation, ensuring confidentiality, and the freedom to discontinue participation at any moment without consequence were all explained to the participants.

Before any data was collected, informed consent was acquired. Coding was utilized to protect participant confidentiality, and all information was safely preserved and used only for educational purposes.

Result:

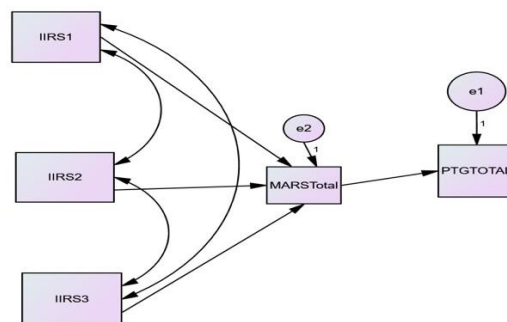
The demographic characteristics of the participant (N=400) indicates that majority were (72.3%) are married. Regarding employment status most (72.3%) were employed and lived in (60%) in urban settings. For education level, the majority hold a Bachelor's degree (54.8%), followed by secondary education (25.5%), and Master's degree (19.8%). Overall, the data suggests the sample is predominantly married, employed, urban-based, and relatively well-educated with a strong representation of bachelor-level graduates.

Table#1

Model fitness indicates of Confirmatory Factory Anaylsis (N=400)

P Value	CFI	IFI	CMIN/DF	DF	PGFI
0.05	0.999	0.999	2.524	3	0.199

This table demonstrates the fit measures of the Confirmatory Factor Analysis (CFA) model used on a sample of 400 respondents. The results reveal that the CFA measurement model has a remarkable fit, with the Comparative Fit Index (CFI = 0.999) and Incremental Fit Index (IFI = 0.999) being very close to 1.00. This indicates a very acceptable model, considering the values of the two indicators are very close to the ideal number. In addition, the ratio of the chi-square statistic to the degrees of freedom (CMIN/DF = 2.524) has been observed to be reasonable (less than 3). Consequently, the fit is good and acceptable at the threshold level (p-value = 0.05), while the degrees of freedom (DF = 3) show the constraints considered in the model. Notwithstanding the PGFI value (0.199) being low, it is a parsimony index and compared with other models.



Table# 3

Regression weights for the relationship between illness severity, medication adherence and post traumatic growth in chronic patients (N=400).

Factors	Estimate	P
MARSTotal <--- IIRS1	0.375	0.001
MARSTotal <--- IIRS2	0.002	0.992
MARSTotal <--- IIRS3	-0.538	*
PTGTOTAL <--- MARSTotal	1.022	0.004

Table 3 presents the regression weights describing the predictive association between illness severity (IIRS1, IIRS2, IIRS3) and medication adherence (MARSTotal) and the influence of medication adherence on post-traumatic growth (PTGTOTAL) for 400 chronic patients. According to the results, IIRS1 has a significant positive prediction of medication adherence ($p = 0.001$), while IIRS3 has a significant negative influence on medication adherence ($p < 0.001$). Moreover, medication adherence has a significant positive prediction of post-traumatic growth ($p = 0.004$).

Discussion:

The goal of this study was to investigate the connection between illness severity, medication adherence, and post-traumatic growth in chronic illnesses. The results confirm the assumption that chronic illness represents both a health issue and a behavioral/psychological problem. Thus, the main conclusions include the following: illness severity considerably influences medication taking and psychological growth processes; adherence also plays an important role in the enhancement of post-traumatic growth. According to the study results, illness severity turned out to be significantly associated with medication adherence. These results correspond to predictions made by the Self-Regulation Model (Leventhal et al., 2003). In accordance with this model, patients form representations regarding illness severity. Illness representations determine patients' behaviors, including adherence. If patients feel that they have a particularly serious problem, they may become more conscious about treatment process, and thus show higher adherence to medication. Another reason explaining this phenomenon lies in the Health Belief Model proposed by Rosenstock (1974), according to which patients will follow treatment more actively if there is a perceived threat. Nevertheless, previous studies provide contradictory evidence suggesting that illness severity can lead to lower medication adherence in case of emotional exhaustion, higher treatment burden, and general fatigue (Jimmy & Jose, 2011). According to the results obtained in this research, in the current sample, illness severity positively impacted adherence. One may explain it with the fact that respondents visited doctors' clinics, received proper counseling, and remained aware of the consequences of chronic diseases.

In addition, the study revealed that severity of illness was a statistically significant predictor of PTG. This finding is consistent with the idea put forward by Tedeschi & Calhoun (2004)

on PTG theory in relation to the process of overcoming difficult times. The experience of chronic illness, despite being prolonged, acts as a source of adversity and challenges an individual regarding his or her identity, habitual routines, and sense of control. Patients that suffer more from intrusiveness caused by disease are likely to undergo reflection of life goals, spiritual and emotional adjustments. Thus, the conflict with illness could bring improvement of the patient's appreciation of life, development of resilience, and building interpersonal connections that are considered the key features of PTG. Further, the finding that adherence significantly predicts PTG shows that adherence may be regarded as a behavior factor of protection and stabilization that positively influences psychological well-being. As patients comply with treatment regimen, their symptoms may stay under control, complications decrease, and their daily functioning becomes less complicated. Consequently, patients may feel emotionally stable, as they will not have the fear of negative consequences of poor health condition. On the contrary, when patients are poor adherers, they will suffer from worsening health and increased distress, which may lower the level of coping and prevent psychological growth. The above idea is consistent with WHO's concept of medication adherence as the factor of good clinical and non-clinical functioning (Sabaté, 2003). It is especially valuable that the study confirmed that adherence works as a mediator between illness severity and PTG. That is, the impact of illness severity on PTG is not direct, as medication adherence can play the intermediate role. More specifically, as the severity of disease increases, patients' motivation to take drugs increases as well, which allows improving patients' health and increasing opportunities for psychological adaptation and PTG. It should be noted that such an interaction between adherence and PTG closes the gap existing in the literature regarding the topic, as previous research tends to examine these two factors independently (Horne et al., 2013). Implications are numerous from the findings described above. Clinicians need to be aware that while managing physical health needs is crucial, psychological well-being and development are equally important. Promotion of proper medication adherence through counseling and education might not help just to avoid negative consequences; it could positively transform patients' emotions. In a similar vein, patients suffering from acute illnesses need to get psychological support through therapies like meaning-making intervention, resilience training, and counseling because severity can lead to personal growth.

Conclusion:

To conclude, this paper shows how the severity of the disease affects both adherence to medication and PTG in patients who suffer from chronic diseases. In addition, this paper reveals that adherence to medication plays an essential role as a behavioral predictor of psychological growth. As such, adherence can act as a mediator for the effect of the severity of the disease on PTG. As a result, promoting adherence to medication and using psychological coping strategies could be crucial for managing physical and psychological well-being.

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