http://doi.org/10.57127/kpd.26024438.1570236

Experiential avoidance, self-efficacy, rejection sensitivity, and psychological symptoms in individuals with and without chronic illness

Gizem Gerdan[1], Yılmaz Orhun Gürlük[2]

Keywords
chronic illness, experiential avoidance, self-efficacy, rejection sensitivity, anxiety and depression, psychological symptoms

Abstract
The comorbidities of chronic physical illnesses and mental disorders are quite common, and the interaction of mental health issues with other health conditions indicates the need to examine psychological factors for effective intervention methods. This study aims to investigate the differences between individuals with and without chronic illness in terms of experiential avoidance, self-efficacy, rejection sensitivity, and psychological symptoms (anxiety and depression), as well as to test the mediating role of experiential avoidance in the relationship between self-efficacy, rejection sensitivity, and psychological symptoms among individuals with chronic illness. The sample comprised 221 volunteer participants (109 with chronic illness, 112 without chronic illness). Individuals with chronic illness exhibited higher levels of experiential avoidance, rejection sensitivity, anxiety, and depression, as well as lower self-efficacy, compared to those without chronic illness. The effect sizes of the differences between the groups ranged from medium to large. In the chronic illness group, self-efficacy and rejection sensitivity predicted psychological symptoms through the full mediation of experiential avoidance. The model explained 31.2% of experiential avoidance and 34.4% of the psychological symptoms. Additionally, causal mediation analyses and sensitivity analyses affirmed the robustness of these mediation effects. Implications for clinical practice were discussed, suggesting the importance of a holistic perspective and psychological interventions for individuals with chronic illness, as well as the potential functionality of interventions that address experiential avoidance in the relationship between self-efficacy, rejection sensitivity, and psychological health among these individuals.

Anahtar kelimeler
kronik hastalık, deneyimsel kaçınma, öz yeterlik, reddedilme duyarlılığı, anksiyete ve depresyon, psikolojik belirtiler

Öz

Kronik hastalığı olan ve olmayan bireylerde deneyimsel kaçınma, öz-yeterlik, reddedilme duyarlılığı ve psikolojik belirtiler

Kronik fiziksel hastalıklar ve ruh sağlığı sorunlarının komorbiditeleri oldukça yaygın görülmekle birlikte, ruh sağlığı sorunlarının diğer sağlık koşullarıyla etkileşime girmesi, etkili müdahale yöntemleri için psikolojik faktörlerin incelenmesine işaret etmektedir. Bu çalışmanın amacı, kronik hastalığı olan ve olmayan bireyler arasındaki deneyimsel kaçınma, öz yeterlilik, reddedilme duyarlılığı ve psikolojik semptomlar (anksiyete ve depresyon) açısından farklılıkları inceleme ve kronik hastalığı olan bireylerde öz yeterlilik, reddedilme duyarlılığı ve psikolojik semptomlar arasındaki ilişkide deneyimsel kaçınmanın aracılık rolünü test etmektedir. Örneklem 221 gönüllü katılımcıdan oluşmaktadır (109'u kronik hastalığı olan, 112'si kronik hastalığı olmayan). Kronik hastalığı olan bireyler, kronik hastalığı olmayanlara göre daha yüksek düzeyde deneyimsel kaçınma, reddedilme duyarlılığı, anksiyete ve depresyon belirtileri gösterirken, öz yeterlilikleri daha düşük bulunmuştur. Gruplar arasındaki farklılıklar orta ve yüksek düzey arasında istatistiksel etki göstermektedir. Kronik hastalığı olan bireylerde, öz yeterlilik ve reddedilme duyarlılığı, deneyimsel kaçınmanın tam aracılığı ile psikolojik semptomları yordamıştır. Modelin deneyimsel kaçınmanın %31.2'sini ve psikolojik semptomların %34.4'ünü açıkladığı görülmüştür. Ayrıca, nedensel aracılık analizleri ve duyarlılık analizleri bu etkilerin sağlamlığını doğrulamıştır. Klinik uygulamalar için çıkarımlar tartışılmış olup, kronik hastalığı olan bireyler için bütünsel bir bakış açısının ve psikolojik müdahalelerin önemi vurgulanmıştır. Ayrıca, kronik hastalığı olan bireylerde öz yeterlilik, reddedilme duyarlılığı ve psikolojik sağlık arasındaki ilişkide deneyimsel kaçınmayı hedef alan müdahalelerin potansiyel işlevselliğine de değinilmiştir.

To cite: Gerdan, G., & Gürlük, Y. O. (2025). Experiential avoidance, self-efficacy, rejection sensitivity, and psychological symptoms in individuals with and without chronic illness. *Journal of Clinical Psychology Research, 9*(3), 359-374.

Gizem Gerdan · gizemgerdan@gmail.com | [1]Asst. Prof., Izmir Democracy University, Faculty of Science and Letters, Department of Psychology, Izmir, Türkiye; [2]Asst. Prof., Izmir Democracy University, Faculty of Science and Letters, Department of Psychology, Division of Psychometrics, Izmir, Türkiye.
Received *Oct 19, 2024,* ***Revised*** *Dec 30/Feb 1, 2024,* ***Accepted*** *Feb 3, 2025*

The slogan 'No health without mental health,' introduced by the World Health Organization (WHO), is becoming increasingly widespread (WHO, 2012). As the slogan has been adopted by various institutions and organizations, corresponding national strategies have also begun to be implemented by many countries (Prince et al., 2007; Sampson & Fox, 2023). This emphasizes the interconnectedness and interaction of mental health, resilience, and physical health (WHO, 2012). With the global burden of chronic physical illnesses (noncommunicable diseases) and mental disorders becoming increasingly significant (WHO, 2015, 2022), the comorbidity rate of these conditions has also markedly increased (Daré et al., 2019). Accordingly, the relationship between chronic illnesses and mental health is increasingly becoming a subject of scrutiny in the context of rising comorbidity rates, widespread prevalence, and global burden (Daré et al., 2019; Huang et al., 2023; Sampson & Fox, 2023).

Research has consistently shown that there is a bidirectional relationship between chronic illness and mental health conditions (Gómzly, 2024; Prince et al., 2007; The National Association of Chronic Disease Directors, 2011). Negative health behaviors (e.g., smoking, reduced activity), poor medication adherence, low self-care, and a weakened immune system have been found to be associated with mental health conditions such as anxiety and depression. (Prince et al., 2007; Vasile, 2020). On the other hand, some studies have indicated that the primary and secondary consequences of stressors associated with chronic diseases—such as pain, disability, limitations, and social, relational, or financial impacts—negatively affect mental health, contributing to depressive and anxiety disorders (Katon, 2011; Verhaal et al., 2005). Beyond this, anxiety has been reported to contribute to vulnerability to chronic medical conditions over time, and the neurological correlates of stress responses adversely affect various body systems, including cardiovascular, respiratory, renal, and endocrine systems, as well as immunity (Culpeper, 2009; Kariuki-Nyuthe & Stein, 2014). In depression as well, elevated cortisol levels, changes in the autonomic nervous system, metabolic factors, and alterations in the hypothalamic-pituitary axis have been observed, and these changes have been reported to create biological effects that may increase the risk of developing chronic diseases such as diabetes, heart disease, asthma, and hypertension (Brown et al., 2004; Katon, 2011). That is, the relationship between chronic illness and mental health conditions is observed to be mutually influential through both biological and behavioral mechanisms.

These interconnected processes point to the critical role of fundamental psychological mechanisms that are determinants for mental health and well-being in individuals with chronic illnesses. Among these mechanisms, experiential avoidance is considered a potential predictor due to its influence on how individuals cope with negative emotional experiences (Castro et al., 2021). Experiential avoidance refers to an individual's unwillingness to stay in contact with unwanted private experiences (e.g., thoughts, feelings, memories, physical sensations, and other internal experiences) and their attempts to escape or avoid distress and negative emotions (Hayes et al., 1996). As a transdiagnostic variable, experiential avoidance plays a role in the etiology, maintenance, and modification of various psychological disorders (Chawla and Ostafin, 2007). Previous research has shown that individuals with chronic illnesses exhibit higher levels of experiential avoidance compared to those without chronic conditions (Castro et al., 2021; Countinho et al., 2021) and higher levels of anxiety (Countinho et al., 2021). Experiential avoidance has been found to be a significant predictor of psychological health (Castro et al., 2021) and a mediator in the relationship between anxiety and psychological quality of life (Coutinho et al., 2021) in chronic conditions. In individuals with chronic illnesses, higher experiential avoidance has been found to be associated with greater anxiety (Michalova et al., 2021a), as well as with negative illness appraisals, and is negatively associated with treatment adherence (Fayyaz & Yusuf, 2023). Avoidance-focused strategies, including experiential avoidance, have been associated with poorer psychosocial adaptation in individuals with chronic illnesses, manifesting as reduced well-being and heightened levels of depression and anxiety (Livneh, 2019). Anxiety disorders have also been found to be associated with the emergence of future physical health symptoms, with experiential avoidance playing a fully mediating role in this relationship (Berghoff et al., 2017). In general, findings in the literature draw attention to the role of experiential avoidance in mental health, emphasizing its negative impact on the mental health of individuals with chronic illnesses, its undermining effect on well-being, and its contribution to adverse outcomes in disease management.

In addition to the key role of psychological mechanisms such as experiential avoidance in chronic conditions, self-efficacy emerges as another potential factor influencing psychological outcomes. Self-efficacy, a construct rooted in social cognitive theory, refers to an individual's beliefs or judgments about their ability to perform the necessary activities to achieve a specific outcome (Bandura, 1982). These beliefs influence various processes, including cognition, motivation, emotion, and decision-making, by shaping how individuals feel, think, motivate themselves, and behave (Bandura, 1982, 1997). Rather than being solely tied to the possession of specific skills, self-efficacy reflects an individual's perception of their capabilities and their potential to achieve desired outcomes (Bandura, 1997). Chronic conditions are stated to require a set of skills to manage them both emotionally and physically, with self-efficacy identified as one of these essential skills (Anekwe & Rahkovsky, 2018). Studies have shown that lower self-efficacy has been linked to

greater illness perception, more severe perceived consequences, reduced physical activity, and more negative emotional responses (Bonsaksen et al., 2012). A negative association has been found between illness perception and self-efficacy, such that the greater the perceived consequences of the illness, the lower the general self-efficacy for coping with the condition (Lau-Walker, 2004). Additionally, individuals with chronic illnesses have been reported to have lower self-efficacy levels compared to those with acute conditions (Endler et al., 2001). Furthermore, the relationship between self-efficacy and psychological outcomes is also widely recognized (Bassi et al., 2021; Keane & Loades, 2017; Orth & Robins, 2013). The role of self-efficacy in chronic illnesses, along with its influence on mental health, suggests that this relationship may potentially extend to the mental health context of individuals with chronic conditions. Indeed, individuals diagnosed with depression or anxiety among those with multiple chronic conditions were reported to have significantly lower health self-efficacy (i.e., belief in their ability to manage health-related situations and maintain a healthy lifestyle; Schwarzer & Renner, 2009), compared to those without such diagnoses, with psychological health identified as a predictor of health self-efficacy (Rutten et al., 2016). Lower self-efficacy and lower illness perception have also been significantly associated with higher levels of anxiety and depression in individuals with chronic illnesses (Eindor-Abarbanel et al., 2021; Imai et al., 2020; Knowles et al., 2019); as well as maladaptive coping (Knowles et al., 2019). These findings are considered to highlight the critical importance of self-efficacy as a key component in psychological well-being and coping among individuals with chronic illnesses.

Another psychological component that is considered to be a determinant of psychological health in individuals with chronic illnesses is rejection sensitivity. Rejection sensitivity is defined as a cognitive-affective processing disposition characterized by anxiously expecting, readily perceiving rejection, and overreacting to rejection (Downey & Feldman, 1997). Individuals with high rejection sensitivity perceive signs of potential rejection more readily and tend to interpret ambiguous signs negatively (Gao et al., 2017; Nacak et al., 2021). Repeated rejection experiences involving social pain can lead to a negative self-perception and heightened interpersonal sensitivity, which, in turn, can adversely affect psychological health (Nacak et al., 2021). A previous meta-analysis found that increased rejection sensitivity is associated with higher mental health problems, including anxiety and depression (Gao et al., 2017). No specific studies have been identified that examine the relationship between rejection sensitivity, psychological mechanisms, and mental health outcomes in individuals with chronic illnesses; however, indirect findings on this topic have been reported in several studies. For instance, individuals with somatoform pain disorder were found to have higher rejection sensitivity scores compared to healthy controls. An increased rejection sensitivity was associated with heightened depression (Nacak et al., 2021). Moreover, it has been reported that individuals with musculoskeletal pain experience feelings of lack of understanding and helplessness during interactions with doctors and perceive medical support or treatment failure as a form of rejection (Davis et al., 2011; Feldman et al., 1999), which can be considered a reflection of rejection sensitivity. Similarly, asthmatic patients were also found to be more sensitive to rejection-related stressors compared to healthy controls (Roth & Kreitler, 2020). In another study conducted on individuals with celiac disease, high rejection concerns were also found to be related to lower self-esteem, reduced quality of life, decreased social support, and less acceptance of illness (Shani & van Zalk, 2024). Limited indirect findings in the literature indicate that rejection sensitivity may play a role in the psychological state of individuals with chronic illnesses. This is thought to suggest that the topic requires further investigation.

In parallel with the increasing prevalence of chronic diseases, diabetes, asthma, and hypertension are also among the frequently reported chronic illnesses or non-communicable diseases and are even considered health conditions requiring action (The Australian Institute of Health and Welfare, 2024; WHO, 2015). These chronic illnesses typically cannot be cured with medication or resolve spontaneously (Bernell & Howard, 2016). The prolonged course of the illness and its resistance to treatment necessitate long-term management (Dowrick et al., 2005; Zhang et al., 2019), which, in turn, increases emotional distress and burden (Demain et al., 2015; Revenson & Hoyt, 2016), demonstrating the importance of not underestimating psychological components. Notably, mental health issues among individuals with chronic illnesses are expected to become an urgent global concern in the coming years (Akif et al., 2024; Zhang et al., 2019), as these individuals tend to exhibit more severe symptoms of both their mental health conditions and their chronic illnesses (National Institute of Mental Health, 2024). Recent studies also emphasize the need for further research to clarify and better understand the relationship between mental health and physical illness, particularly in the context of the mental health issues that frequently coexist with chronic illnesses (Huang et al., 2023; Shinkov et al., 2018; The National Association of Chronic Disease Directors, 2011). In addition to all these considerations, it has also been reported that individuals with comorbid chronic illnesses and mental health disorders incur significantly higher medical expenses and experience greater functional impairment (Katon, 2011). Therefore, studies aiming to understand the relationship between chronic illnesses and mental health are thought

to contribute significantly to the literature and provide a foundation for developing functional evaluation and treatment approaches from a multidisciplinary perspective in individuals with chronic illnesses. Asthma, diabetes, and hypertension are also considered among the groups that require adopting this perspective. As mentioned earlier, this is because these conditions are identified as requiring action, exhibit resistance to medication, follow a prolonged course, and necessitate management, with the increasing psychological burden in this context clearly demonstrating that psychological components should not be overlooked in these groups. Research focusing on these groups is expected to provide significant benefits in determining evaluation and treatment approaches tailored to their specific needs.

Moreover, as highlighted in detail in the above literature, experiential avoidance, self-efficacy, and rejection sensitivity emerge as potentially important clinical factors influencing mental health and well-being in individuals with chronic illnesses. Experiential avoidance, beyond its association with mental health, is also clinically linked to self-efficacy and rejection sensitivity. From the perspective of self-efficacy, anxiety or worry about coping, or the belief in one's ineffectiveness in regulating or managing a situation, is associated with greater engagement in avoidance strategies (Michel, 2022; Spitzen et al., 2022). In chronic conditions accompanied by persistent challenges, the values, attitudes, beliefs, expectations, and judgments of patients regarding their capacity to cope are known to influence fear-avoidant beliefs. Specifically, when self-efficacy is low, patients are more likely to adopt fear avoidance behaviors, as they may perceive certain activities as threatening. These beliefs and behaviors can lead to an increase in physical complaints such as pain, a reduction in activity levels, and greater disability, further reinforcing maladaptive coping patterns (de Moraes Vieira, 2014). Additionally, lower levels of self-efficacy in individuals with chronic illnesses have been linked to dysfunctional coping strategies, indicating that self-efficacy plays a crucial role in adaptive coping mechanisms (Di Giacomo et al., 2024; Endler et al., 2001). It has also been shown that increased rejection sensitivity is closely associated with heightened avoidance behaviors (Sintos, 2017; Stadnik, 2021). Increased rejection sensitivity activates a defensive motivational system involving avoidance in interactions or situations perceived as having the potential for rejection (Downey et al., 2004). Thus, both self-efficacy and rejection sensitivity appear to be closely associated with avoidant coping. Therefore, in individuals with chronic illnesses, decreased self-efficacy and heightened rejection sensitivity may be associated with increased experiential avoidance, which, in turn, may contribute to the severity of psychological symptoms. However, no study in the literature has been identified that simultaneously examines experiential avoidance, rejection sensitivity, self-efficacy, and mental health in individuals with chronic illnesses. The current study aims to investigate the differences in self-efficacy, experiential avoidance, rejection sensitivity, anxiety, and depression between individuals with and without self-reported asthma, hypertension, and diabetes (type I and II), while also examining the mediating role of experiential avoidance in the relationship between self-efficacy, rejection sensitivity, and psychological symptoms among individuals with these chronic conditions. In this respect, the study is considered to make significant contributions to the field by providing a better understanding of the psychological factors associated with chronic illnesses and guiding future research and clinical practices.

Within the framework of our purpose, the following hypotheses were tested:

H1: Individuals with chronic illnesses have higher experiential avoidance, rejection sensitivity, and psychological symptoms, and lower self-efficacy compared to healthy controls.

H2: Both self-efficacy and rejection sensitivity are indirectly associated with psychological symptoms through the mediation of experiential avoidance in individuals with chronic illnesses.

METHODS

Participants

This cross-sectional study sample comprised 221 volunteer participants, including 138 females (62.4%) and 83 males (37.6%), aged between 20 and 47 years (M_{age} = 28.70, SD = 6.567), with 43.9% (n = 97) having 12 years of education and 56.1% (n = 108) having more than 12 years of education. The chronic physical illness group consisted of 109 volunteer participants aged 20 to 46 years (M_{age} = 29.17, SD = 6.694), with self-reported conditions of asthma (n = 48; 44%), diabetes (type I and II) (n = 33; 30.3%), and hypertension (n = 28; 25.7%), while the comparison group included 112 voluntary participants aged 21 to 47 years (M_{age} = 28.23, SD = 6.437) who reported no clinical diagnosis of chronic physical illness. Participants were recruited through a convenience sampling technique.

The groups were equivalent in terms of age, $t(219) = 1.067$, $p = .287$; gender, $\chi^2(1, n = 221) = 0.00$, $p = .986$; education status, $\chi^2(1, n = 221) = 1.103$, $p = .521$; and employment status, $\chi^2(1, n = 221) = 3.217$, $p = .200$. The groups were also equivalent in terms of self-reported psychiatric diagnosis $\chi^2(1, n = 221) = 1.103$, $p = .317$ and smoking status $\chi^2(1, n = 221) = 3.168$, $p = .075$.

Measures

Participant Information Form The form included questions about participants' demographic characteristics such as age, gender, education level, and employ-

ment status, as well as variables related to chronic illness status, chronic illness type (asthma, diabetes, hypertension), psychiatric diagnoses, and smoking status.

Rejection Sensitivity Questionnaire (RSQ) The scale was developed by Downey and Feldman (1996) to measure rejection sensitivity, which is the tendency to anxiously anticipate rejection, quickly develop perceptions of rejection, and be overly reactive. The Turkish adaptation study of the scale was conducted by Göncü Köse et al. (2017). The scale consists of 18 items and is a self-report scale with a 6-point Likert-type rating (α = .83). The total score for the scale was calculated within the scope of the current study. In the current study, Cronbach's alpha was .89. A high score means high rejection sensitivity.

Hospital Anxiety and Depression Scale (HADS) HADS (Zigmond and Snaith, 1983) is a 14-item self-report scale that aims to measure anxiety and depression levels for individuals with physical illness. The scale consists of two subscales: anxiety (7 items) and depression (7 items). Each item is rated on a 4-point Likert-type scale from 0 (never) to 3 (very often). The Turkish standardization of the HADS was performed by Aydemir et al. (1997). The Turkish version has been shown to be a valid and reliable measurement tool with internal consistency (α = .70 - .85), test-retest reliability, and construct validity (Aydemir et al., 1997). The cut-off scores of the scale are reported as 10 for the anxiety subscale and 7 for the depression subscale (Aydemir et al., 1997). The increasing scores indicate higher levels of anxiety and depression. In this study, the total score of HADS was used to assess psychological symptoms. Coefficient alpha here was .87.

Acceptance and Action Questionnaire II (AAQ-II) The scale was first developed with its 16-item form by Hayes et al. (2004) to measure experiential avoidance, in other words, psychological flexibility. Due to the inadequacy of its psychometric properties, a revised form of the scale, AAQ-II, was developed by Bond et al. (2011). AAQ-II is a self-report scale consisting of 7 items and a 7-point Likert-type rating. Increasing scores on the single-dimension scale indicate increased experiential avoidance (psychological inflexibility). The validity and reliability study of the scale for the Turkish sample was conducted by Yavuz et al. (2016). In that study, overall reliability value was found to be .84. The total score was calculated to assess experiential avoidance within the scope of our study. The internal consistency coefficient alpha value was found to be .88.

General Self-Efficacy Scale (GSES) The original scale was constructed by Schwarzer and Jerusalem (1995) to measure general self-efficacy, which is defined as a person's belief that s/he can perform the behaviors required for certain outcomes. The scale consists of 10 items scored, and high scores indicate high self-efficacy. In the adaptation process to Turkish (Aypay, 2010), the items were first arranged using the translation-retranslation method, and then the two-factor structure (effort and resistance and ability and confidence) of the scale was determined using principal component analysis. The Cronbach's alpha internal consistency coefficient for the total scale was found to be .83, while it was calculated as .79 for "effort and resistance" and .63 for "ability and confidence". In the present study, the total score was used to assess self-efficacy. The GSES demonstrated good reliability in this study (α = .85).

Procedure

Ethical approval for the current research was received from the Scientific Ethics Committee of Izmir Democracy University (Approval no: 2024/09-06). An announcement was made at the university, in the university's health unit and through different channels (e-mail groups, academic staff, students, internet announcement) to reach individuals with asthma, type I and II diabetes, and hypertension. Volunteer participants who applied through the contact information in the announcement were included in the study based on whether they had relevant chronic illness for one year or more (Centers for Disease Control and Prevention, 2024). The exclusion criteria for the study included being under the age of 18, stating a history of alcohol or substance dependence, stating a psychiatric disorder that impairs judgment (e.g., psychotic disorders or bipolar disorder), lack of informed consent for voluntary participation, failure to complete the questionnaire and scales, and illiteracy. Additionally, the following group-specific criteria were applied: in the chronic illness group, stating a condition other than diabetes, asthma, or hypertension, or being newly diagnosed (less than one year); and in the healthy control group, stating a history of any chronic or severe physical illness. The study's data were collected online using Google Forms. Participants first provided their informed consent after reviewing the consent and information form. They then completed the Participant Information Form and the scales included in the study.

Statistical Analysis

It is known that performing statistical calculations in different programs increases the error variance (Peng, 2011; Piccolo & Frampton, 2016). Therefore, most analyses (chi-square analysis, t-tests, descriptive statistics, and a mediation model with 5000 bootstraps) were performed in the R-based JASP 0.18.2 program (JASP Team, 2023). However, since there are no pair-

Table 1. Descriptive Statistics and Correlations among the Study Variables

	1	2	3	4
1. Rejection Sensitivity	-			
2. Psychological Symptoms	.372*	-		
3. Experiential Avoidance	.480*	.652*	-	
4. Self-Efficacy	-.326*	-.364*	-.398*	-
Mean	8.203	18.647	24.344	23.760
SD	3.257	9.135	8.700	6.969

Note. $n = 221$, $^{*}p < .001$.

wise comparison tests for multivariate variance analysis in JASP, the relevant analysis was run using SPSS 27.0 (IBM Corp., 2020). No outliers were found according to box plots-scores, central distribution indices, and statistical distances. Skewness and kurtosis values were accepted as normally distributed with a range of ± 1. Multivariate normality was assessed by keeping Mahalanobis distance z-values between ± 3 (Burdenski, 2000; Streiner & Norman, 1995).

Firstly, descriptive statistics were calculated to examine the characteristics of the sample. Subsequently, a MANOVA was conducted to investigate how the relevant variables (rejection sensitivity, psychological symptoms, experiential avoidance, and self-efficacy) differed between individuals with and without a chronic illness.

Although a simple regression model has traditionally been used to establish the primary relationship between dependent and independent variables before mediation analyses, modern methods recommend incorporating the mediator variable as an additional independent variable in the regression model (Sun et al., 2021; Valente & MacKinnon, 2017; Yzerbyt et al., 2018; Zhang & Li, 2023). This adjustment is important because the relationship between the mediator and the dependent variable is also critical. Even if the independent variable initially shows no direct relationship with the dependent variable, the inclusion of the mediator variable may reveal an indirect relationship. In order for the multicollinearity assumption to be accepted, VIF must be less than 10 and tolerance must be greater than .10 (Tabachnick & Fidell, 2013).

A mediation model checked by the Process Package in JASP (Hayes, 2022) was established to examine how self-efficacy and rejection sensitivity predicted psychological symptoms via the mediation of experiential avoidance in individuals with chronic disorder (CD). Finally, causal mediation analysis was conducted using the MEDIATION package in R to evaluate the sensitivity of effects in the mediation model and to assess the relative contributions of the independent and mediator variables (Tingley et al., 2014).

RESULTS

Descriptive Statistics and Group Comparisons

Before moving on to the stage of examining the relationships between variables, normal distribution assumptions were examined and it was seen that all scores were normally distributed: rejection sensitivity (*skewness* = .310*, kurtosis* = -.510), psychological symptoms (*skewness* = .581*, kurtosis* = -.523), experiential avoidance (*skewness* = .342*, kurtosis* = -.284), and self-efficacy (*skewness* = -.059*, kurtosis* = -.638). In the multivariate normality examinations performed for multivariate analyses, it was seen that the z values of the Mahalanobis distance were distributed between +2.898 and -1.399. Table 1 displays the study variables' means, standard deviations, and Pearson correlations. All study variables showed a moderate or high positive correlation with each other, $p < .001$.

For examining the difference in the research variables, a MANOVA model was established in which illness status was considered as an independent variable when examining the means, and all four study variables as dependent variables. The Box-M test (p = .027), which was applied to see the equality of covariances, was found to be significant, Wilk's lambda criterion (Ateş et al., 2019; Gupta, 1971) was used. On the other hand, since the variance homogeneity determined by Levene test, which is the necessary condition for calculating pairwise group comparisons, was provided by experiential avoidance (F [1, 219] = 0.485, p = .487), rejection sensitivity (F [1, 219] = 2.086, p = .150), and self-efficacy (F [1, 219] = 0.233, p = .630), but not by psychological symptoms (F [1, 219] = 13.950, $p < .001$). For pairwise comparison (Post-Hoc Test), the Bonferroni test was used for variables where the assumption was accepted, and the Games-Howell test was used for variables where it was not. According to Wilks' Lambda criterion (F [4, 216] = 2080.953, $p < .001$, $\eta_p^2 = .975$), it was determined that the model was accepted. As a result of the pairwise comparisons, it was found that all variables were differentiated by illness status at the level of $p <$ .001. The individuals with chronic illness had higher experiential avoidance, psychological symptoms, and rejection sensitivity scores, while they had lower self-efficacy compared to individuals without chronic illness. Table 2 presents the mean differences tests and descriptive statistics.

Mediation Model Testing

After group comparison investigations, the mediation model was examined. In that model, self-efficacy and rejection sensitivity predicted psychological symptoms

Table 2. Descriptive Statistics for Mean Comparison

	Group	*Mean*	*SD*	*N*	*ΔMean*	*p*	η_p^2
Experiential Avoidance	Chronic Illness	28.596	7.935	109	8.391	< .001	.234
	Healthy	20.205	7.329	112			
Rejection Sensitivity	Chronic Illness	9.046	3.472	109	1.663	< .001	.065
	Healthy	7.383	2.814	112			
Self-Efficacy	Chronic Illness	21.358	6.449	109	6.331	< .001	.116
	Healthy	15.027	6.679	112			
Psychological Symptoms	Chronic Illness	22.367	9.466	109	7.340	< .001	.162
	Healthy	15.027	7.169	112			

Note. *SD:* Standard Deviation, *ΔMean:* Mean Differences, η_p^2*:* Effect Size.

Table 3. Mediation Coefficients of Study Variables

Direct Effects	*B*	*β*	*z*	p_z *(95% CI)*	R^2	F	p_F
RS→EA	1.048	.458	5.455	< .001 (.669/1.406)	.312	23.980	< .001
SE→EA	-.249	-.203	-2.410	.016 (-.460/-.021)			
EA→PS	.700	.587	7.561	< .001 (.532/.866)	.344	56.117	< .001
Total Effects							
RS→PS	.733	.269	4.424	< .001 (.426/1.073)	.344	56.117	< .001
SE→PS	-.174	-.119	-2.296	.022 (-.349/-.015)			
Indirect Effects							
RS→EA→PS	.733	.269	4.424	< .001 (.426/1.073)			
SE→EA→PS	-.174	-.119	-2.296	.022 (-.349/-.015)			

Note. *RS = rejection sensitivity, PS = psychological symptoms, EA = experiential avoidance, SE = self-efficacy.*

through the mediation of experiential avoidance. First of all, for collinearity diagnostic and controlling direct relations, linear regression analysis was run. Considering this situation, the assumption is met: The variance inflation factor (VIF) indices ranged between 1.178-1.423, and the tolerance values distributed between .688-.849. It was detected that psychological symptoms were directly and significantly predicted only by experiential avoidance (β = .460, t = 4.965, p < .001). On the other hand, rejection sensitivity (β = .170, t = 1.851, p = .067) and self-efficacy (β = -.108, t = -1.293, p = .199) did not have significant predictive effects on psychological symptoms. It was observed that 38% of the psychological symptom variance was explained, R^2 = .380, F(3, 105) = 21.473, p < .001 (see Table 3). The effect of rejection sensitivity and self-efficacy on psychological symptoms was not included in the model while analyzing the mediation model because of the insignificant direct relationships.

As a result of mediation analysis, it was determined that both rejection sensitivity (B = .733, β = .269, z = 4.424, p < .001, *95% CI* = .440/1.071) and self-efficacy (B = -.174, β = -.119, z = -2.296, p = .022, *95% CI* = -.352/-.020) significantly predicted psychological symptoms through experiential avoidance, R^2 = .344, F(1, 108) = 56.117, p < .001. Experiential avoidance as the mediator variable has a total variance of 34.6%

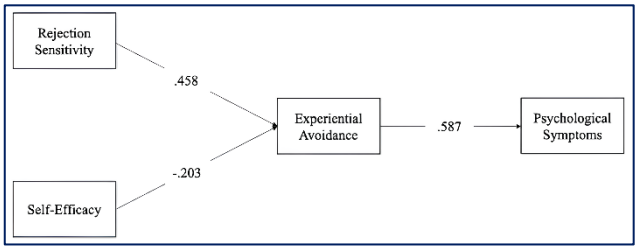

Figure 1. Standardized Coefficients of the Mediation Model

(F [2, 107] = 56.117, p < .001) that was explained by rejection sensitivity and self-efficacy, see Figure 1.

Causal Mediation Analysis

In order to see the pure effect of the mediation model, separate analyses were conducted for each predictor due to the nature of the causal mediation analysis. Table 4 demonstrates that both rejection sensitivity and self-efficacy significantly predict psychological symptoms through experiential avoidance in line with ACME values. Rejection sensitivity has a positive average causal mediation effect (*ACME* = .557, p < .001) on the model, while experiential avoidance has a negative effect (*ACME* = -.194, p < .001). The ACME explained the total effect (B = .975, p < .001), including all observed and unobserved mediating pathways between the psychological symptoms and rejection sen-

Table 4. Causal Mediation Analysis for Independent Variables

	Rejection Sensitivity			Self-Efficacy		
	Estimate	95% CI[#]	*p*-value	Estimate	95% CI[#]	*p*-value
ACME	.557	.267/.920	< .001	-.194	.353/-.070	.002
ADE	.418	-.078/.090	.100	-.251	-.501/.000	.048
Total Effect	.975	.440/1.470	< .001	-.445	-.693/-.182	< .001
Prob. Mediated	.568	.282/1.151	< .001	.436	.153/.980	.002
Sensitivity parameters:	ρ = -0.1 ρ = 0	ACME = 0 ACME = .557		ρ = -0.1 ρ = 0	ACME = 0 ACME = -194	

Note. [#]Quasi-Bayesian Confidence Interval.

sitivity. On the other hand, the ACME explained the total effect (B = -.445, p < .001), including all observed and unobserved mediating pathways between the psychological symptoms and self-efficacy.

Assuming sequential negligibility, Figure 2 shows the value of the sensitivity measure ρ (ρ = -0.1) when the estimated ACME is 0. To demonstrate the ACME's resilience to breaks in the negligibility assumption, ρ must be ≤ -0.1 (Chi et al., 2022).

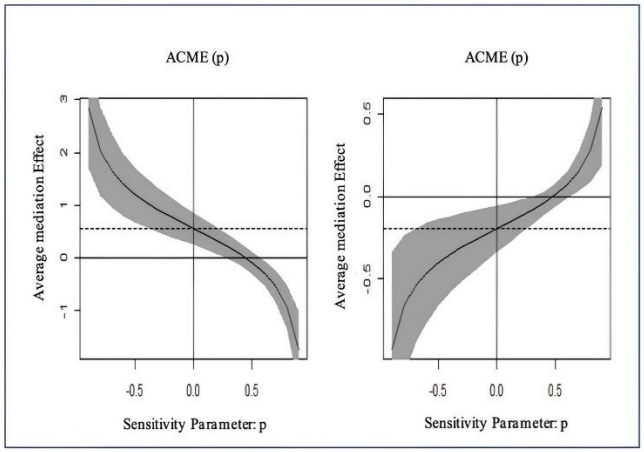

Figure 2. Sensitivity Analysis (left for rejection sensitivity, right for self-efficacy). ***Note.*** The continuous ignorance assumption is used to calculate the ACME (*Rejection Sensitivity* = .557, *Self-Efficacy* = -.194) without correlation (ρ = 0), as indicated by the dashed line. Keep in mind (Chi et al., 2022) that for - ACME to become positive, $\rho \leq -0.1$.

DISCUSSION

This study aimed to examine differences in experiential avoidance, self-efficacy, rejection sensitivity, anxiety, and depression symptoms between individuals with and without chronic illness. Furthermore, we were particularly interested in investigating the mediating role of experiential avoidance in the relationship between self-efficacy, rejection sensitivity, and psychological symptoms among individuals with chronic illness. To the best of our knowledge, our study is the first to examine the relevant clinical variables in individuals with a relevant sample, thus possessing pioneering characteristics.

Consistent with our first hypothesis, individuals with chronic illnesses exhibited significantly higher levels of experiential avoidance, rejection sensitivity, and psychological symptoms, as well as lower levels of self-efficacy, compared to those without chronic illnesses. Previously, psychological symptoms and comorbidities of mental disorders have been widely reported in individuals with chronic medical conditions (Daré et al., 2019; Liao et al., 2022), aligning with the findings of this study. Individuals with chronic illnesses were reported to exhibit higher levels of experiential avoidance and lower psychological health compared to those without chronic illnesses (Castro et al., 2021; Coutinho et al., 2021; Vally et al., 2024). Similarly, consistent with the study findings, individuals with chronic illnesses were reported to have lower self-efficacy compared to those with acute illnesses (Endler et al., 2011) and healthy controls (Köprülüoğlu et al., 2023; Uccelli et al., 2016). In parallel, while asthmatic patients were found to be more sensitive to rejection-related stressors than healthy controls (Roth & Kreitler, 2020), rejection concerns have also been identified as a determining factor in partner selection among individuals with celiac disease (Shani & van Zalk, 2024). Moreover, individuals with chronic illnesses reported experiencing fears of being excluded or forgotten when withdrawing from activities due to health-related reasons (Liu et al., 2015). They also face rejection-related fears associated with disclosing their illness (Kralik et al., 2001; Liu et al., 2015; Mulvaney et al., 2008). Therefore, the results regarding intergroup differences are considered to be in parallel with the findings of the literature.

Furthermore, of our greatest interest, our findings showed that experiential avoidance fully mediates the relationship between self-efficacy, rejection sensitivity, and psychological symptoms in individuals with chronic illness, confirming the mediation hypothesis (H2). Causal mediation analyses and sensitivity analyses also enhanced the robustness of the findings. In individuals with chronic illness, as self-efficacy decreases and rejection sensitivity increases, greater experiential avoidance emerges, which intensifies anxiety and depression, namely psychological symptoms. Our findings on experiential avoidance, self-efficacy, and psychological health are consistent with previous empirical findings. Higher levels of experiential avoidance have also been found to be associated with an increased likelihood of receiving a medical health diagnosis (Blakey et al., 2021). Experiential avoidance being identified as a transdiagnostic variable in the maintenance and modification of psychological condi-

tions (Fernández-Rodríguez et al., 2018) further supports its role in psychological symptoms in our study. Moreover, as in our study, the mediating role of experiential avoidance in chronic illnesses has been well-documented in various studies. Experiential avoidance or avoidant-oriented coping has been shown to mediate the relationships between inflammatory bowel disease symptomatology and physical and psychological quality of life (Trindade et al., 2016), illness perception and psychological health (Knowles et al., 2019), anxiety and psychological quality of life (Coutinho et al., 2019) or quality of life (Vally et al., 2024), generalized anxiety and poorer asthma control (Michalova et al., 2021b), anxiety sensitivity and psychological distress (Ugwu et al., 2020), and illness appraisal and adherence to medications for chronic diseases (Fayyaz & Yusuf, 2023). That is, experiential avoidance has been evidenced as a fundamental mediating variable in chronic illnesses, influencing both psychological outcomes and illness-related perception and management. Similarly, consistent with the findings of this study, in chronic conditions, experiential avoidance has been found to be positively associated with anxiety sensitivity, psychological distress, and psychological health (Castro et al., 2021; Coutinho et al., 2021; Michalova et al., 2021a; Trindade et al., 2016, 2018; Ugwu et al., 2020; Vally et al., 2024). Furthermore, it has been identified as a significant predictor of anxiety, depression symptoms, and distress in individuals with chronic illnesses (Castro et al., 2021; Knowles et al., 2019; Ugwu et al., 2020).

In chronic illness, self-efficacy was found to be negatively associated with depression (Fan & Lv, 2014; Knowles et al., 2019; Ludman et al., 2013), anxiety (Knowles et al., 2019), increased concern and emotional reactivity (Bonsaksen et al., 2012), and subjective well-being (Luo et al., 2023). Another study on individuals with asthma also reported negative relations between self-efficacy, anxiety, and experiential avoidance (Michalova et al., 2021b). Additionally, in individuals with diabetes mellitus, low self-efficacy was found to be related to more emotion-focused coping (avoidance-oriented) strategies and to greater symptoms of anxiety and depression (Knowles et al., 2019). All of these findings are also parallel to the patterns of association observed in the present study and support its results.

As mentioned earlier, our study also found that rejection sensitivity predicted psychological symptoms through the mediation of experiential avoidance in individuals with chronic illnesses. Although several findings outside the context of chronic illnesses indicate that increased rejection sensitivity is associated with greater experiential avoidance or the use of maladaptive coping strategies, as well as heightened psychological symptomatology or worse mental health outcomes (Gao et al., 2017; Pearson et al., 2011; Sintos, 2017; Stadnik, 2021), relationships between rejection sensitivity and the variables in the current study among individuals with chronic illnesses have not been identified. However, some findings have been identified that are thought to indirectly support the relationship between rejection sensitivity, avoidance behaviors, and mental health in chronic illnesses. For instance, the hesitation of individuals with chronic illnesses to participate in social environments due to fear of rejection, along with a reduction in their social interactions (Lacroix et al., 1995), and the role of perceived exclusion in fostering social isolation tendencies, as well as the association of decreased social behaviors with psychosocial outcomes such as depression and reduced life satisfaction (Iovino et al., 2023), may indicate a relationship between rejection sensitivity, avoidance behaviors, and psychological health. Individuals with diabetes tend to conceal their health condition due to expected negative evaluations, especially stigma, and they avoid social activities while trying to discreetly administer their insulin (Shiu et al., 2003). Furthermore, it has been noted that they do not perform regular self-monitoring of blood glucose and attempt to avoid drawing attention by consuming unhealthy foods, which has been reported to be associated with increased anxiety (Singh et al., 2012; Wellard et al., 2008). These behaviors are thought to reflect the anxiety driven by rejection sensitivity and associated avoidance tendencies in individuals with diabetes, and such strategies are considered to have negative impacts on both psychological health and overall well-being. Lastly, in individuals with high blood pressure, suppressing emotions such as anger and refraining from expressing distress—used as defensive strategies to avoid disapproval (avoidance of rejection)—have been associated with heightened stress reactivity (Jorgensen & Thibodeau, 2007). This situation may reflect rejection sensitivity and avoidance tendencies, which could contribute to increased physiological and psychological stress in individuals with hypertension.

Clinical Implications

The co-morbidities of chronic illness and mental disorders are steadily increasing, remaining a significant source of concern (Daré et al., 2019). This situation also leads to more severe symptoms and further exacerbates health outcomes (Akif et al., 2024; National Institute of Mental Health, 2024). Diabetes, asthma, and hypertension are among the most commonly reported chronic conditions (WHO, 2015), and comorbid mental health issues within these groups are well-documented (e.g., Garrett & Doherty, 2014; Kretchy et al., 2014; Stubbs et al., 2022). Moreover, it is well-established that mental health problems also have adverse effects on physical health (Huang et al., 2023). Functional impairments, high costs, and elevated mortality risks have also been reported in these chronic

conditions (Das, 2022; Wang et al., 2017). These findings underscore the necessity of adopting an integrated approach to such diseases while emphasizing the critical role of psychological health.

The findings of the study are also thought to provide evidence highlighting the importance of holistic assessments and interventions that include psychological processes in individuals with chronic illnesses, supporting the notion that chronic illnesses are a biopsychosocial experience. Our study's findings suggest that interventions addressing self-efficacy, experiential avoidance, and rejection sensitivity in individuals with chronic illnesses could contribute to positive psychological health outcomes. Furthermore, experiential avoidance is considered to play a central role in psychological interventions, and this is supported by the results of the mediation analysis. This is because experiential avoidance strategies are commonly employed in cognitive structures such as self-efficacy and rejection sensitivity, and avoidance-focused strategies appear to reinforce these characteristics. Indeed, Bandura (1982) states that individuals tend to avoid situations they believe they cannot cope with, and that a person's sense of self-efficacy is related to how much effort they will exert and how long they will endure in the face of challenging experiences. For example, a diabetic patient's weak belief in their ability to use insulin or regularly measure their blood sugar and act accordingly, avoiding social activities due to concerns about not being able to find a suitable meal, or relying heavily on a constant source of help out of fear of being unable to manage crises, can be considered examples of avoidance behaviors associated with reduced self-efficacy. That is, the belief in self-efficacy is closely related to approach or avoidance behaviors. Specifically, individuals who avoid situations that evoke negative emotional experiences miss the opportunity to encounter positive corrective experiences, further diminishing their self-efficacy (Mehrdoost et al., 2013; Werner & Gross, 2010). Indeed, the enhancement of self-efficacy through the application of Acceptance and Commitment Therapy, which targets internal experiences and their avoidance in individuals with diabetes (Hosseini et al., 2021), serves as further evidence of the dynamic relationship between self-efficacy and experiential avoidance in the context of chronic illness.

Similarly, in rejection sensitivity, heightened sensitivity to rejection-related cues and the associated anxiety lead to the use of various avoidance-focused strategies, such as withdrawal, avoiding interaction, avoiding intimacy, seeking excessive reassurance, or ruminating about past perceived rejections. These strategies, in turn, reinforce the anxiety related to rejection (Shin et al., 2024). For instance, in relation to rejection sensitivity, a diabetic patient may hide their eating habits or insulin use in social settings; consume unhealthy foods, avoid using insulin, or avoid social activities due to the anxiety that this situation will create. In addition, hesitating to share issues related to their disease in romantic relationships, due to the potential for rejection, can be considered an example of this situation.

It should also be noted that safety behaviors (a type of avoidance behavior) often mistaken for safety precautions in various chronic conditions are frequently overlooked, despite being strongly emphasized as critical contributors to adverse psychological and physiological outcomes (Sharpe et al., 2022). For example, behaviors such as avoiding exercise or avoiding being alone to "stay on the safe side" of blood sugar levels in diabetic patients are noted not only to perpetuate anxiety but also to potentially worsen long-term health outcomes. It has been underscored that in exposure interventions, it is essential to assess whether such behaviors are genuinely necessary as safety behaviors and whether their presence reduces anxiety (Freckleton et al., 2014; Sharpe et al., 2022). In sum, anxiety, fear or negative thoughts associated with rejection sensitivity and self-efficacy in chronic illnesses may persist through increased avoidance behaviors and/or safety behaviors. However, it is well known that while avoidance provides short-term relief, in the long term, emotional problems are reinforced and persist (Hayes et al., 1996), ultimately leading to an increase in symptomatology (Fernández-Rodríguez et al., 2018).

Moreover, interventions that target the reduction of experiential avoidance can support physiological processes as well as psychological health. Factors such as treatment, medication use, restrictions, pain, and discomfort can be sources of stress in chronic physical conditions (Vancampfort et al., 2017), while daily stresssors also come into play. It has been shown that psychological chronic stress factors, and even daily stressors, can lead to autonomic, immunological, and endocrinological changes (Kiecolt-Glaser & Glaser, 1995; Seiler et al., 2020). Additionally, avoidance-focused strategies, such as suppressing negative emotions, used to cope with these stressors, have been found to be associated with deteriorated health indicators, including impaired immune system functioning and endocrine parameters (Carhart, 2015; De Miguel et al., 2011; Kiecolt-Glaser et al., 1995; Zozulya et al., 2008). Therefore, the way negative emotions are managed, or the approach-avoidance conflict is handled, appears to be a significant predictor of overall well-being. Moreover, accepting internal experiences (e.g., sensations, emotions, thoughts) rather than avoiding them has been associated with physiological improvements (e.g., glycemic control) and reduced anxiety in diabetes (Alho et al., 2022; Gregg et al., 2007), as well as reductions in pain and pain-related anxiety (Vowles & McCracken, 2008). Additionally, exposure-based treatments targeting excessive avoidance behaviors in asthma patients have been linked to decreased catastrophizing about asthma, improved asthma control, and reductions in worry and anxiety sensitivity (Bonnert et al., 2021).

In summary, how individuals with chronic illnesses cope with stressors or negative internal experiences appears to be significant for both psychological and physiological well-being. In psychotherapy interventions and related evaluations for individuals with chronic illnesses, it is considered beneficial to assess and target self-efficacy, rejection sensitivity, avoidance behaviors associated with these, and even increased safety behaviors to achieve functional outcomes and clinical improvements. In other words, targeting improvements in self-efficacy and reductions in rejection sensitivity by addressing avoidance behaviors through interventions such as exposure or behavioral experiments is believed to lead to improvements in self-efficacy and reductions in rejection sensitivity, which, in turn, is thought to impact psychological well-being positively. It seems crucial to adopt clinical practices and supportive policies that take psychological aspects into account in the management of chronic illnesses. In the biopsychosocial struggle associated with chronic illnesses, it is believed that considering psychological outcomes such as anxiety and depression, along with clinical variables like experiential avoidance, self-efficacy, and rejection sensitivity, which contribute to the emergence of these outcomes, will improve the psychological health and functional outcomes of individuals with chronic illnesses.

Limitations and Future Directions

The present study has certain limitations as well as several strengths. The cross-sectional nature limits the interpretation of the findings. However, the use of mediation and sensitivity analyses regarding the robustness of the results in this study is thought to strengthen the inferences based on predictive relationships. While causal mediation analysis is recommended in clinical studies (Whittle et al., 2016), it is also noted that inferences can be made based on statistical predictive relationships (Hayes, 2022). Nevertheless, future research conducted with a longitudinal design could provide evidence supporting causality between relationships. Information regarding physical chronic illnesses was obtained through self-report, and future research could mitigate the potential for misleading or incomplete information related to personal perceptions by using more objective measures, such as health data based on medical records. The AAQ-II, which has been criticized recently for its close relationship with negative emotional states, was used in our study to assess experiential avoidance (Kashdan et al., 2020). Kashdan et al. (2020) have noted that the AAQ-II is more closely related to emotional distress than psychological flexibility. They have indicated that the AAQ-II is confounded with distress and emotional disturbances, making it inadequate for assessing psychological flexibility. However, no specific issues have been reported regarding the validity of the AAQ-II in measuring experiential avoidance resulting from negative emotional experiences. Additionally, it has been reported that the AAQ-II is more strongly related to anxiety, depression, and stress than to psychological distress (Tyndall et al., 2019). Moreover, a recent study using the Graded Response Model (a polytomous item response theory approach) confirmed that the psychometric properties of the scale are sufficient for assessing experiential avoidance, reporting high discriminative indices for the items (Langer et al., 2024). Therefore, the evidence supporting its validity in assessing experiential avoidance suggests that this limitation is unlikely to have significantly impacted our findings. Nonetheless, future studies could consider using different measures to address potential concerns. Moreover, further research on the structure of the AAQ-II, particularly testing its validity in different clinical samples, is clearly needed. Additionally, based on the findings that stigma is related to mental health, coping (avoidant coping), and self-efficacy in chronic illnesses (Rose et al., 2017; Schabert et al., 2013; Shiu et al., 2003), future studies could evaluate the potential effects of stigma on individuals with chronic illnesses in relation to mental health, experiential avoidance, self-efficacy, and rejection sensitivity, which may provide a more comprehensive understanding.

Conclusions

This study found that individuals with chronic illness have higher levels of experiential avoidance, rejection sensitivity, and psychological symptoms (i.e., anxiety and depression) compared to the comparison group without chronic illness, while their self-efficacy is lower. Furthermore, our study presents preliminary findings on the relationship between self-efficacy, rejection sensitivity, and psychological symptoms through experiential avoidance among individuals with chronic illness. The findings demonstrate that lower self-efficacy and higher rejection sensitivity predict an increase in psychological symptoms through increased experiential avoidance, and causal mediation analyses and sensitivity analyses confirm the robustness of our findings. These results indicate that targeting the reduction of tendencies to avoid, suppress, or control unpleasant internal experiences, namely experiential avoidance, has potential benefits regarding self-efficacy, rejection sensitivity, and psychological symptoms in individuals with chronic illness.

DECLARATIONS

Compliance with Ethical Standards Study procedures were approved by Izmir Democracy University Ethics Committee (Approval no: 2024/0906, Date: 04.09.2024).

Conflict of Interest All authors of this article declare that they have no conflict of interest regarding the article.

Informed consent Informed consent was obtained from all participants included in the study.

Project/Funding No fund was obtained for this study.

Data Sharing/Availability Data is available upon reasonable request.

Authors' Contributions [GG] worked on the theoretical framework, data processing, and discussion sections, while [YOG] worked on the data processing, methodology, and analysis sections. The researchers contributed equally to the article in terms of workload.

Use of Artificial Intelligence Only AI was used for language corrections.

REFERENCES

Akif, A., Qusar, M. S., & Islam, M. R. (2024). The impact of chronic diseases on mental health: An overview and recommendations for care programs. *Current Psychiatry Reports, 26,* 394-404.

Alho, I., Lappalainen, P., Muotka, J., & Lappalainen, R. (2022). Acceptance and commitment therapy group intervention for adolescents with Type 1 diabetes: A randomized controlled trial. *Journal of Contextual Behavioral Science, 25*, 153–161.

Anekwe, T. D., & Rahkovsky, I. (2018). Self-Management: A comprehensive approach to management of chronic conditions. *American Journal of Public Health*, *108* (S6), S430-S436.

Ateş, C., Kaymaz, Ö., Kale, H. E., & Tekindal, M. A. (2019). Comparison of test statistics of nonnormal and unbalanced samples for multivariate analysis of variance in terms of type-I error rates. *Computational and Mathematical Methods in Medicine*, 1-8.

Australian Institute of Health and Welfare. (2024, June 17). *Chronic disease overview*. https://www.aihw.gov.au/reports-data/health-conditions-disability-deaths/chronic-disease/overview

Aydemir, Ö., Güvenir, T., Küey, L., & Kültür, S. (1997). Hastane Anksiyete ve Depresyon Ölçeği Türkçe formunun geçerlilik ve güvenilirlik çalışması. *Türk Psikiyatri Dergisi, 8*(4), 280-287.

Aypay, A. (2010). Genel Öz Yeterlik Ölçeği'nin GÖYÖ Türkçe'ye uyarlama çalışması. *İnönü Üniversitesi Eğitim Fakültesi Dergisi*, *11*(2), 113-131.

Bandura, A. (1982). Self-efficacy mechanism in human agency. *American Psychologist*, *37*(2), 122-147.

Bandura, A. (1997). *Self-efficacy: The exercise of control.* W.H. Freeman and Company.

Bassi, G., Mancinelli, E., Di Riso, D., & Salcuni, S. (2021). Parental stress, anxiety and depression symptoms associated with self-efficacy in pediatric type 1 diabetes: A literature review. *International Journal of Environmental Research and Public Health, 18*(1), 152.

Berghoff, C. R., Tull, M. T., DiLillo, D., Messman-Moore, T., & Gratz, K. L. (2017). The role of experiential avoidance in the relation between anxiety disorder diagnoses and future physical health symptoms in a community sample of young adult women. *Journal of Contextual Behavioral Science, 6*(1), 29-34.

Bernell, S., & Howard, S. W. (2016). Use your words carefully: What is a chronic disease? *Frontiers in Public Health*, *4,* 159.

Blakey, S. M., Halverson, T. F., Evans, M. K., Patel, T. A., Hair, L. P., Meyer, E. C., DeBeer, B. B., Beckham, J. C., Pugh, M. J., Calhoun, P. S., & Kimbrel, N. A. (2021). Experiential avoidance is associated with medical and mental health diagnoses in a national sample of deployed Gulf War veterans. *Journal of Psychiatric Research*, *142*, 17-24.

Bond, F. W., Hayes, S. C., Baer, R. A., Carpenter, K. M., Guenole, N., Orcutt, H. K., & Zettle, R. D. (2011). Preliminary psychometric properties of the Acceptance and Action Questionnaire–II: A revised measure of psychological inflexibility and experiential avoidance. *Behavior Therapy, 42*(4), 676-688.

Bonnert, M., Särnholm, J., Andersson, E., Bergström, S. E., Lalouni, M., Lundholm, C., Serlachius, E., & Almqvist, C. (2021). Targeting excessive avoidance behavior to reduce anxiety related to asthma: a feasibility study of an exposure-based treatment delivered online. *Internet Interventions, 25,* 100415.

Bonsaksen, T., Lerdal, A., & Fagermoen, M. S. (2012). Factors associated with self-efficacy in persons with chronic illness. *Scandinavian Journal of Psychology, 53*(4), 333-339.

Brown, E. S., Varghese, F. P., & McEwen, B. S. (2004). Association of depression with medical illness: Does cortisol play a role? *Biological Psychiatry*, *55*(1), 1-9.

Burdenski, T. K., Jr. (2000). Evaluating univariate, bivariate, and multivariate normality using graphical procedures. *Multiple Linear Regression Viewpoints*, *26*(2), 15-28.

Carhart, V. L. (2015). *The relationships between acceptance, avoidance, and immunity in medical rehabilitation.* Bowling Green State University.

Castro, J., Pereira, J., & Ferreira, C. (2021). How do ACT core processes underlie loneliness and psychological health? A study among people with and without physical chronic disease. *Clinical Psychologist*, *25*(3), 329-338.

Centers for Disease Control and Prevention. (2024, May 15). *Chronic diseases.* https://www.cdc.gov/chronicdisease/about/index.html

Chawla, N., & Ostafin, B. (2007). Experiential avoidance as a functional dimensional approach to psychopathology: An empirical review. *Journal of Clinical Psychology, 63*, 871-890.

Chi, W. E., Huang, S., Jeon, M., Park, E. S., Melguizo, T., & Kezar, A. (2022). A practical guide to causal mediation analysis: Illustration with a comprehensive college transition program and nonprogram peer and faculty interactions. *Frontiers in Education, 7*, 1-14.

Coutinho, M., Trindade, I. A., & Ferreira, C. (2021). Experiential avoidance, committed action and quality of life: Differences between college students with and without chronic illness. *Journal of Health Psychology*, *26*(7), 1035-1045.

Culpeper, L. (2009). Generalized anxiety disorder and medical illness. *The Journal of Clinical Psychiatry*, *70*(suppl 2), 20-24.

Daré, L. O., Bruand, P., Gérard, D., Marin, B., Lameyre, V., Boumédiène, F., & Preux, P. (2019). Co-morbidities of mental disorders and chronic physical diseases in developing and emerging countries: A meta-analysis. *BMC Public Health*, *19*(1), 304.

Das, M. (2022). WHO urges immediate action to tackle non-communicable diseases. *The Lancet Oncology*, *23*(11), 1361.

Davis, M. C., Zautra, A. J., & Reich, J. W. (2011). Vulnerability to stress among women in chronic pain from fibromyalgia and osteoarthritis davis et al. stress vulnerability. *Annals of Behavioral Medicine*, *23*(3), 215-226.

Demain, S., Goncalves, A. C., Areia, C., Oliveira, R., Marcos, A. J., Marques, A., Parmar, R., & Hunt, K. (2015). Living with, managing and minimising treatment burden in long term conditions: A systematic review of qualitative research. *PloS one, 10*(5), e0125457.

de Miguel, Z., Vegas, O., Garmendia, L., Arregi, A., Beitia, G., & Azpiroz, A. (2011). Behavioral coping strategies in response to social stress are associated with distinct neuroendocrine, monoaminergic and immune response profiles in mice. *Behavioural Brain Research, 225*(2), 554-561.

de Moraes Vieira, E. B., de Góes Salvetti, M., Damiani, L. P., & de Mattos Pimenta, C. A. (2014). Self-efficacy and fear avoidance beliefs in chronic low back pain patients: Coexistence and associated factors. *Pain Management Nursing 15*(3), 593-602.

Di Giacomo, D., Ranieri, J., Guerra, F., Cilli, E., Sciarra, L., & Romano, S. (2024). Cardiovascular risk and biopsychosocial interplay: Association among hypertension, anxiety, and emotional dysregulation—observational study in primary care setting for efficient self-care. *Clinical Cardiology*, *47*(1).

Downey, G., & Feldman, S. I. (1996). *Rejection Sensitivity Questionnaire (RSQ)* [Database record]. APA Psyc Tests. https://doi.org/10.1037/t01622-000

Downey, G., & Feldman, S. I. (1997). Implications of rejection sensitivity for intimate relationships. *Journal of Personality and Social Psychology*, *70*(6), 1327-1343.

Downey, G., Mougios, V., Ayduk, O., London, B. E., & Shoda, Y. (2004). Rejection sensitivity and the defensive motivational system: Insights from the startle response to rejection cues. *Psychological Science, 15*(10), 668-673.

Dowrick, C., Dixon-Woods, M., Holman, H., & Weinman, J. (2005). What is chronic illness? *Chronic Illness, 1*(1), 1-6.

Eindor-Abarbanel, A., Naftali, T., Ruhimovich, N., Shitrit, A. B. G., Sklerovsky-Benjaminov, F., Konikoff, F., Matalon, S., Shirin, H., Milgrom, Y., Ziv-Baran, T., & Broide, E. (2021). Important relation between self-efficacy, sense of coherence, illness perceptions, depression and anxiety in patients with inflammatory bowel disease. *Frontline Gastroenterology, 12*(7), 601-607.

Endler, N. S., Kocovski, N. L., & Macrodimitris, S. D. (2001). Coping, efficacy, and perceived control in acute vs chronic illnesses. *Personality and Individual Differences*, *30*(4), 617-625.

Fan, X., & Lv, F. (2014). Psychosocial factors associated with self-efficacy for managing chronic disease in patients with chronic heart failure. *European Journal of Cardiovascular Nursing*, *15*(4), 255-261.

Fayyaz, A., & Yusuf, S. (2023). Prediction of adherence through illness appraisal of individuals with diabetes: Role of experiential avoidance. *Journal of Professional & Applied Psychology*, *4*(2), 140-151.

Feldman, S. I., Downey, G., & Schaffer-Neitz, R. (1999). Pain, negative mood, and perceived support in chronic pain patients: A daily diary study of people with reflex sympathetic dystrophy syndrome. *Journal of Consulting and Clinical Psychology*, *67*(5), 776-785.

Fernández-Rodríguez, C., Paz-Caballero, D., González-Fernández, S., & Pérez-Álvarez, M. (2018). Activation vs. experiential avoidance as a transdiagnostic condition of emotional distress: An empirical study. *Frontiers in Psychology, 9*, 1618.

Freckleton, E., Sharpe, L., & Mullan, B. (2014). The relationship between maternal fear of hypoglycaemia and adherence in children with type-1 diabetes. *International Journal of Behavioral Medicine, 21*(5), 804-810.

Gao, S., Assink, M., Cipriani, A., & Lin, K. (2017). Associations between rejection sensitivity and mental health outcomes: A meta-analytic review. *Clinical Psychology Review*, *57*, 59-74.

Garrett, C., & Doherty, A. (2014). Diabetes and mental health. *Clinical Medicine, 14*(6), 669-672.

Gómzly, H. (2024). Mental health and physical health: The bidirectional relationship and its implications for internal medicine. *Archives of General Internal Medicine, 8*(5), 258.

Gregg, J. A., Callaghan, G. M., Hayes, S. C., & Glenn-Lawson, J. L. (2007). Improving diabetes self-management through acceptance, mindfulness, and values: A randomized controlled trial. *Journal of Consulting and Clinical Psychology*, *75*(2), 336-343.

Göncü Köse, A., Özen Çığlak, A., Ulaşan, E. T., & Sümer, N. (2017). Reddedilme Duyarlılığı Ölçeğinin Türkçeye uyarlanması. *Nesne Psikoloji Dergisi, 5,* 383-403.

Gupta, A. K. (1971). Noncentral distribution of Wilks' statistic in Manova. *The Annals of Mathematical Statistics*, *42*(4), 1254-1261.

Hayes, A. F. (2022). *The PROCESS macro for SPSS, SAS, and R* (Version 4.2) [Computer software]. https://processmacro.org

Hayes, S. C., Strosahl, K., Wilson, K. G., Bissett, R. T., Pistorello, J., Toarmino, D., Polusny, M., A., Dykstra, T. A., Batten, S. V., Bergan, J., Stewart, S. H., Zvolensky, M. J., Eifert, G. H., Bond, F. W., Forsyth, J. P., Karekla, M., & McCurry, S. M. (2004). Measuring experiential avoidance: A preliminary test of a working model. *The Psychological Record, 54*, 553-578.

Hayes, S. C., Wilson, K. G., Gifford, E. V., Follette, V. M., & Strosahl, K. (1996). Experiential avoidance and behavioral disorders: A functional dimensional approach to diagnosis and treatment. *Journal of Consulting and Clinical Psychology, 64*, 1152-1168.

Hosseini, S. S., Ahadi, M., Hatami, M., & Khalatbari, J. (2021). Comparison of the effectiveness of mindfulness-based therapy and acceptance and commitment therapy on resilience, psychological well-being and blood sugar levels in patients with type 2 diabetes. *Iranian Journal of Psychiatric Nursing*, *9*(1), 89-102.

Huang, Y., Loux, T., Huang, X., & Feng, X. (2023). The relationship between chronic diseases and mental health: A cross-sectional study. *Mental Health & Prevention*, *32*, 200307.

IBM Corp. (2020). *IBM SPSS Statistics for Windows* (Version 27.0) [Computer software]. IBM Corp.

Imai, H., Furukawa, T. A., Hayashi, S., Goto, A., Izumi, K., Hayashino, Y., & Noda, M. (2020). Risk perception, self-efficacy, trust for physician, depression and behavior modification in diabetic patients. *Journal of Health*

Psychology, 135910531771805.

Iovino, P., Vellone, E., Cedrone, N., & Riegel, B. (2023). A middle-range theory of social isolation in chronic illness. *International Journal of Environmental Research and Public Health, 20*(6), 4940.

JASP Team. (2023). *JASP* (Version 0.18.2) [Computer software].

Jorgensen, R. S., & Thibodeau, R. (2007). Defensive avoidance of disapproval: The relationship of a defensive style to physical and mental health. *Harvard Review of Psychiatry*, *15*(1), 9-17.

Kariuki-Nyuthe, C., & Stein, D. J. (2014). Anxiety and related disorders and physical illness. In *Key issues in mental health (Online)/Key issues in mental health (Print)* (pp. 81-87).

Kashdan, T. B., Disabato, D. J., Goodman, F. R., Doorley, J. D., & McKnight, P. E. (2020). Understanding psychological flexibility: A multimethod exploration of pursuing valued goals despite the presence of distress. *Psychological Assessment*, *32*(9), 829-850.

Katon, W. J. (2011). Epidemiology and treatment of depression in patients with chronic medical illness. *Dialogues in Clinical Neuroscience*, *13*(1), 7-23.

Keane, L., & Loades, M. (2017). Review: Low self-esteem and internalizing disorders in young people - A systematic review. *Child and Adolescent Mental Health, 22*(1), 4-15.

Kiecolt-Glaser, J. K., & Glaser, R. (1995). Psychoneuroimmunology and health consequences: Data and shared mechanisms. *Psychosomatic Medicine*, *57*(3), 269-274.

Knowles, S. R., Apputhurai, P., O'Brien, C. L., Ski, C. F., Thompson, D. R., & Castle, D. J. (2019). Exploring the relationships between illness perceptions, self-efficacy, coping strategies, psychological distress and quality of life in a cohort of adults with diabetes mellitus. *Psychology Health & Medicine*, *25*(2), 214-228.

Köprülüoğlu, M., Naz, İ., Aktaş, B., Kömürcüoğlu, B., & Kaya, D. Ö. (2023). Comparison of self-efficacy and problem-solving skills between women with asthma and healthy controls: A cross-sectional study. *Thoracic Research and Practice, 24*(6), 304-308.

Kralik, D., Koch, T., & Telford, K. (2001). Constructions of sexuality for midlife women living with chronic illness. *Journal of Advanced Nursing, 35*(2), 180-187.

Kretchy, I. A., Owusu-Daaku, F. T., & Danquah, S. A. (2014). Mental health in hypertension: Assessing symptoms of anxiety, depression and stress on anti-hypertensive medication adherence. International *Journal of Mental Health Systems, 8*(1), 25-30.

Lacroix, A., Jacquemet, S., Assal, J. P., & Benroubi, M. (1995). The patients' voice: Testimonies from patients suffering from chronic disease. *Patient Education and Counseling, 26*(1-3), 293-299.

Langer, Á. I., Ponce, F. P., Ordóñez-Carrasco, J. L., Fuentes-Ferrada, R., Mac-Ginty, S., Gaete, J., & Núñez, D. (2024). Psychometric evidence of the Acceptance and Action Questionnaire-II (AAQ-II): An item response theory analysis in university students from Chile. *BMC Psychology, 12*(1), 111.

Lau-Walker, M. (2004). Relationship between illness representation and self-efficacy. *Journal of Advanced Nursing, 48,* 216-225.

Liao, B., Xu, D., Tan, Y., Chen, X., & Cai, S. (2022). Association of mental distress with chronic diseases in 1.9 million individuals: A population-based cross-sectional study. *Journal of Psychosomatic Research, 162*, 111040.

Liu, L. S., Inkpen, K. M., & Pratt, W. (2015, February). " I'm not like my friends" understanding how children with a chronic illness use technology to maintain normalcy. *In Proceedings of the 18th ACM Conference on Computer Supported Cooperative Work & Social Computing* (pp. 1527-1539).

Livneh, H. (2019). The use of generic avoidant coping scales for psychosocial adaptation to chronic illness and disability: A systematic review. *Health Psychology Open, 6*(2), 2055102919891396.

Ludman, E. J., Peterson, D., Katon, W. J., Lin, E. H. B., Von Korff, M., Ciechanowski, P., Young, B., & Gensichen, J. (2013). Improving confidence for self care in patients with depression and chronic illnesses. *Behavioral Medicine*, *39*(1), 1-6.

Luo, Z., Zhong, S., Zheng, S., Li, Y., Guan, Y., Xu, W., Li, L., Liu, S., Zhou, H., Yin, X., Wu, Y., Liu, D., & Chen, J. (2023). Influence of social support on subjective well-being of patients with chronic diseases in China: Chain-mediating effect of self-efficacy and perceived stress. *Frontiers in Public Health*, *11,* 1184711.

Mehrdoost, Z., Neshatdoost, H., & Abedi, A. (2013). Effectiveness of acceptance and commitment therapy on the decrease of self-focused attention and improving self-efficacy. *Journal of Psychological Models and Methods*, *3*(11), 67-81.

Michalova, L., Dhasmana, D., Chaudhuri, R., Yang, J., Smith, S., & Morris, P. (2021a). The role of generalised anxiety in asthma outcomes: Experiential avoidance and self-efficacy as mediators. *Thorax*, *76,* A127-A128.

Michalova, L., Morris, P., Dhasmana, D., Power, K., Chaudhuri, R., & Yang, F. (2021b). *The role of generalised anxiety in asthma morbidity: Experiential avoidance and self-efficacy as mediators* (Unpublished doctoral dissertation). University of Edinburgh, Scotland.

Michel, R. (2022). *The role of self-efficacy in the relationship between experiential avoidance and anxiety* (Unpublished master's thesis). University of Rhode Island, USA.

Mulvaney, S. A., Mudasiru, E., Schlundt, D. G., Baughman, C. L., Fleming, M., VanderWoude, A., Russell, W. E., Elasy, T. A., & Rothman, R. (2008). Self-management in type 2 diabetes. *The Diabetes Educator, 34*(4), 674-682.

Nacak, Y., Morawa, E., & Erim, Y. (2021). High rejection sensitivity in patients with somatoform pain disorder. *Frontiers in Psychiatry, 12*, 602981.

National Institute of Mental Health (NIMH). (2024). *Understanding the link between chronic disease and depression*. https://www.nimh.nih.gov/health/publications/chronic-illness-mental-health

Orth, U., & Robins, R. W. (2013). Understanding the link between low self-esteem and depression. *Current Directions in Psychological Science, 22*(6), 455-460.

Pearson, K. A., Watkins, E. R., & Mullan, E. G. (2011). Rejection sensitivity prospectively predicts increased rumination. *Behaviour Research and Therapy, 49*(10), 597-605.

Peng, R. D. (2011) Reproducible research in computational science. *Science, 334*(6060), 1226-1227.

Piccolo, S. R., & Frampton, M. B. (2016). Tools and techniques for computational reproducibility. *GigaScience*, *5*(1), 30.

Prince, M., Patel, V., Saxena, S., Maj, M., Maselko, J., Phillips, M. R., & Rahman, A. (2007). No health without mental health. *The Lancet, 370*(9590), 859-877.

Revenson, T. A., & Hoyt, M. A. (2016). Chronic illness and mental health. *Encyclopedia of mental health, 1,* 284-292.

Rose, S., Paul, C., Boyes, A., Kelly, B., & Roach, D. (2017). Stigma-related experiences in non-communicable respiratory diseases: A systematic review. *Chronic Respiratory Disease*, *14*(3), 199-216.

Roth, Y., & Kreitler, S. (2020). Psychological correlates of bronchial asthma in young adults: The cognitive orientation approach. *Open Journal of Asthma*, *4*(1), 001-0010.

Rutten, L. J., Hesse, B. W., St. Sauver, J. L., Wilson, P., Chawla, N., Hartigan, D. B., Moser, R. P., Taplin, S., Glasgow, R., & Arora, N. K. (2016). Health self-efficacy among populations with multiple chronic conditions: The value of patient-centered communication. *Advances in Therapy, 33*, 1440-1451.

Sampson, E., & Fox, K. (2023). No true health without mental health. *Future Healthcare Journal*, *10*(2), 96-97.

Schabert, J., Browne, J. L., Mosely, K., & Speight, J. (2013). Social stigma in diabetes. *Patient*, *6*(1), 1-10.

Schwarzer, R., & Jerusalem, M. (1995). Generalized Self-Efficacy Scale. In J. Weinman, S. Wright, & M. Johnston (Eds.), *Measures in health psychology: A user's portfolio. Causal and control beliefs* (pp. 35-37). NFER-NELSON.

Schwarzer, R., & Renner, B. (2009). *Health-Specific Self-Efficacy Scales*. Freie Universität Berlin. CiteseerX.

Seiler, A., Fagundes, C. P., & Christian, L. M. (2020). The impact of everyday stressors on the immune system and health. In A. Choukèr (Ed.), *Stress challenges and immunity in space* (pp. 71-92).

Springer. Shani, M., & van Zalk, M. H. (2024). Love beyond gluten: Self-esteem, illness identity, and social support in romantic rejection concerns among adolescents with celiac disease. *Frontiers in Psychology, 15*, 1335201.

Sharpe, L., Todd, J., Scott, A., Gatzounis, R., Menzies, R. E., & Meulders, A. (2022). Safety behaviours or safety precautions? The role of subtle avoidance in anxiety disorders in the context of chronic physical illness. *Clinical Psychology Review, 92,* 102126.

Shin, J., Han, K. S., & Shin, H. J. (2024). Rejection sensitivity: A concept analysis. *Journal of Korean Academy of psychiatric and Mental Health Nursing, 33*(3), 253-261.

Shinkov, A., Borissova, A., Kovatcheva, R., Vlahov, J., Dakovska, L., Atanassova, I., & Petkova, P. (2018). Increased prevalence of depression and anxiety among subjects with metabolic syndrome and known type 2 diabetes mellitus – A population-based study. *Postgraduate Medicine*, *130*(2), 251-257.

Shiu, A. T., Kwan, J. J. Y., & Wong, R. Y. (2003). Social stigma as a barrier to diabetes self-management: Implications for multi-level interventions. *Journal of Clinical Nursing*, *12*(1), 149-150.

Singh, H., Cinnirella, M., & Bradley, C. (2012). Support systems for and barriers to diabetes management in South Asians and Whites in the UK: Qualitative study of patients' perspectives. *BMJ Open*, *2*(6), e001459.

Sintos, M. L. (2017). Experiential avoidance as a mediator between rejection sensitivity and social interaction anxiety. *Journal of Psychology & the Behavioral Sciences, 3*(2), 13-24.

Spitzen, T. L., Tull, M. T., & Gratz, K. L. (2022). The roles of emotion regulation self-efficacy and emotional avoidance in self-injurious thoughts and behaviors. *Archives of Suicide Research, 26*(2), 595-613.

Stadnik, R. D. (2021). *The relationship between childhood invalidation and borderline personality disorder symptoms through rejection sensitivity and experiential avoidance*. Xavier University.

Streiner, D. L., & Norman, G. R. (1995). *Health Measurement Scales: A practical guide to their development and use* (2nd ed.). Oxford Medical Publications, Inc.

Stubbs, M. A., Clark, V. L., Gibson, P. G., Yorke, J., & McDonald, V. M. (2022). Associations of symptoms of anxiety and depression with health-status, asthma control, dyspnoea, dysfunction breathing and obesity in people with severe asthma. *Respiratory Research, 23*(1), 341.

Sun, R., Zhou, X., & Song, X. (2021). Bayesian causal mediation analysis with latent mediators and survival outcome. *Structural Equational Modelling, 28*, 778-790.Tabachnick, B. G., & Fidell, L. S. (2013). *Using multivariate statistics* (6th ed.). Pearson.

The National Association of Chronic Disease Directors (2011). *Integrating mental health into chronic disease prevention strategies for youth: An opportunity for change*. https://www.chronicdisease.org/resource/resmgr/school_health/integration_of_mental_health.pdf

Tingley, D., Yamamoto, T., Hirose, K., Keele, L., & Imai, K. (2014). Mediation: R Package for causal mediation analysis. *Journal of Statistical Software*, *59*(5), 1-38.

Trindade, I. A., Ferreira, C., & Pinto-Gouveia, J. (2016). Inflammatory bowel disease: The harmful mechanism of experiential avoidance for patients' quality of life. *Journal of Health Psychology, 21*(12), 2882-2892.

Trindade, I. A., Marta-Simões, J., Ferreira, C., & Pinto-Gouveia, J. (2018). Developments on committed action: Validity of the CAQ-8 and analysis of committed action's role in depressive symptomatology in breast cancer patients and healthy individuals. *Clinical Psychology & Psychotherapy, 25*(1), e42-e50.

Tyndall, I., Waldeck, D., Pancani, L., Whelan, R., Roche, B., & Dawson, D. L. (2019). The Acceptance and Action Questionnaire-II (AAQ-II) as a measure of experiential avoidance: Concerns over discriminant validity. *Journal of Contextual Behavioral Science, 12,* 278-284.

Uccelli, M. M., Traversa, S., & Ponzio, M. (2016). A survey study comparing young adults with MS and healthy controls on self-esteem, self-efficacy, mood and quality of life. *Journal of the Neurological Sciences, 36*8, 369-373.

Ugwu, D. I., Onyedibe, M. C. C., & Chukwuorji, J. C. (2020). Anxiety sensitivity and psychological distress among hypertensive patients: The mediating role of experiential avoidance. *Psychology Health & Medicine*, *26*(6), 701-710.

Valente, M. J., & MacKinnon, D. P. (2017). Comparing models of change to estimate the mediated effect in the pretest–posttest control group design. *Structural Equational Modelling, 4*(3), 428-450.

Vally, Z., AlKhanji, R., & Helmy, M. (2024). Anxiety and quality of life in college students with a chronic illness

compared to those without: The mediational roles of experiential avoidance and committed action. *International Journal of Mental Health and Addiction*, 1-17.

Vancampfort, D., Koyanagi, A., Ward, P. B., Veronese, N., Carvalho, A. F., Solmi, M., Mugisha, J., Rosenbaum, S., De Hert, M., & Stubbs, B. (2017). Perceived stress and its relationship with chronic medical conditions and multimorbidity among 229,293 community-dwelling adults in 44 low- and middle-income countries. *American Journal of Epidemiology*, *186*(8), 979-989.

Vasile, C. (2020). Mental health and immunity (Review). *Experimental and Therapeutic Medicine*, *20*(6), 1.

Verhaal, P. F., Heijmans, M. J., Peters, L., & Rijken, M. (2005). Chronic disease and mental disorder. *Social Science & Medicine*, *60*(4), 789-797.

Vowles, K. E., & McCracken, L. M. (2008). Acceptance and values-based action in chronic pain: A study of treatment effectiveness and process. *Journal of Consulting and Clinical Psychology*, *76*(3), 397-407.

Wang, G., Zhou, X., Zhuo, X., & Zhang, P. (2017). Annual total medical expenditures associated with hypertension by diabetes status in U.S. adults. *American Journal of Preventive Medicine*, *53*(6), S182-S189.

Wellard, S. J., Rennie, S., & King, R. (2008). Perceptions of people with type 2 diabetes about self-management and the efficacy of community based services. *Contemporary Nurse*, *29*(2), 218-226.

Werner, K., & Gross, J. J. (2010). Emotion regulation and psychopathology. A conceptual framework. In A. M. Kring & D. M. Sloan (Eds.), *Emotion regulation and psychopathology: A transdiagnostic approach to etiology and treatment* (pp. 13-37). The Guilford Press.

Whittle, R., Mansell, G., Jellema, P., & Van Der Windt, D. (2016). Applying causal mediation methods to clinical trial data: What can we learn about why our interventions (don't) work? *European Journal of Pain*, *21*(4), 614-622.

World Health Organization. (2012, July 12). WHO MiND-bank - *No health without mental health: Implementation framework*. https://extranet.who.int/mindbank/item/4913

World Health Organization. (2015). *Assessing national capacity for the prevention and control of noncommunicable diseases: Report of the 2015 global survey*. https://iris.who.int/bitstream/handle/10665/246223/9789241565363-eng.pdf?sequence=1

World Health Organization. (2022, June 8). *Mental disorders*. https://www.who.int/news-room/fact-sheets/detail/mental-disorders

Yavuz, F., Ulusoy, S., Iskin, M., Esen, F. B., Burhan, H. S., Karadere, M. E., & Yavuz, N. (2016). Turkish version of Acceptance and Action Questionnaire-II (AAQ-II): A reliability and validity analysis in clinical and non-clinical samples. *Bulletin of Clinical Psychopharmacology, 26*(4), 397-408.

Yzerbyt, V., Muller, D., Batailler, C., & Judd, C. M. (2018). New recommendations for testing indirect effects in mediational models: The need to report and test component paths. *Journal of Personality and Social Psychology, 123*(6), 651-667.

Zhang, H., & Li, X. (2023). A framework for mediation analysis with massive data. Statistics and Computing, 33, 86.

Zhang, T., Liu, C., & Ni, Z. (2019). Association of access to healthcare with self-assessed health and quality of life among old adults with chronic disease in China: Urban versus rural populations. *International Journal of Environmental Research and Public Health, 16*(14), 2592.

Zigmond, A. S., & Snaith, R. P. (1983). The Hospital Anxiety and Depression Scale. *Acta Psychiatrica Scandinavica, 67*(6), 361-370.

Zozulya, A. A., Gabaeva, M. V., Sokolov, O. Y., Surkina, I. D., & Kost, N. V. (2008). Personality, coping style, and constitutional neuroimmunology. *Journal of Immunotoxicology*, *5*(2), 221-225.