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EVALUATING THE ROLE OF ANXIETY IN THE RELATIONSHIP BETWEEN ILLNESS UNCERTAINTY AND PSYCHOLOGICAL WELL-BEING AMONG ADULTS WITH CHRONIC ILLNESS IN THE UK

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Abstract

Living with a chronic illness often involves persistent uncertainty about symptoms, prognosis, treatment effectiveness and future functioning. Such uncertainty may affect psychological well-being, particularly when it is accompanied by anxiety. Although illness uncertainty has been linked with psychological adjustment, the processes involved require further investigation. This proposed study will examine whether anxiety statistically mediates the relationship between illness uncertainty and psychological well-being among adults with chronic illness in the United Kingdom. A quantitative, three-wave longitudinal observational design will be used, with data collected at baseline, three months and six months. Adults aged 18 years or over with a diagnosed physical condition lasting, or expected to last, at least 12 months will be recruited. Illness uncertainty will be assessed with an appropriate version of the Mishel Uncertainty in Illness Scale, anxiety with the Generalised Anxiety Disorder-7 (GAD-7) and psychological well-being with the Warwick–Edinburgh Mental Wellbeing Scale (WEMWBS). Depressive symptoms, demographic and clinical characteristics will be included as covariates. Longitudinal path analysis will estimate the indirect association using bootstrapped confidence intervals while accounting for baseline scores. The study will provide UK-focused evidence on psychological processes in chronic illness and may inform more integrated chronic disease care. No empirical findings are reported because the study has not yet been conducted.

1. INTRODUCTION

Chronic illness is an important public health concern because its effects extend beyond physical symptoms and can influence emotional functioning, social relationships, independence and everyday quality of life. People living with long-term conditions may need to manage recurring symptoms, treatment demands, changes in physical capacity and uncertainty about the future. These experiences can create psychological challenges that continue even when a condition is medically stable. In England, the Health Survey for England 2024 reported that 46% of adults aged 16 years and over had at least one longstanding illness or condition, defined as a condition affecting the body or mind for at least 12 months (NHS England Digital, 2026). Although this figure relates to England rather than the whole United Kingdom, it demonstrates the scale of long-term health needs within a major part of the UK population.

The psychological experience of chronic illness is not determined solely by diagnosis or disease severity. Individuals may also experience uncertainty about the meaning of symptoms, the effectiveness of treatment, the likelihood of deterioration and the extent to which their condition will affect future plans. Mishel's Uncertainty in Illness Theory explains that uncertainty arises when individuals cannot adequately interpret illness-related events

because information is incomplete, inconsistent, complex or unpredictable (Mishel, 1981, 1988). For people with chronic conditions, this uncertainty may become a continuing feature of daily life rather than a temporary response to diagnosis.

Anxiety may be an important psychological response to this uncertainty. When individuals cannot predict symptoms or understand what changes in their condition mean, they may become increasingly worried about possible negative outcomes. Persistent anxiety may, in turn, be associated with poorer emotional adjustment and a less positive view of life. The relationship is potentially reciprocal: uncertainty may contribute to anxiety, while anxiety may make ambiguous health information more difficult to interpret. This study therefore focuses on anxiety as a possible mediating variable between illness uncertainty and psychological well-being, while acknowledging that reciprocal effects will be examined as a sensitivity analysis.

The aim of the proposed study is to determine whether anxiety statistically mediates the longitudinal relationship between illness uncertainty and psychological well-being among adults living with chronic illness in the UK. The objectives are to estimate the association between earlier illness uncertainty and subsequent anxiety; to estimate the association between anxiety and later psychological well-being after accounting for baseline well-being and illness uncertainty; to estimate the total, direct and indirect associations between illness uncertainty and well-being; and to examine whether the findings are robust to depressive symptoms, clinical characteristics, attrition and alternative model specifications. The corresponding research question is whether anxiety helps to explain the association between illness uncertainty and later psychological well-being. By collecting data at three time points, the study will provide a stronger temporal assessment than a single cross-sectional survey, although its observational design will not establish causation.

2. Literature Review

Illness uncertainty is a central concept in the study of psychological adaptation to long-term health conditions. Mishel (1981) developed the Mishel Uncertainty in Illness Scale to assess uncertainty experienced by people facing illness-related events. The theory proposes that uncertainty can arise when symptoms are ambiguous, information is insufficient, treatment outcomes are unpredictable or healthcare situations are difficult to understand. Mishel (1984) further examined perceived uncertainty and stress in illness, demonstrating the importance of understanding uncertainty as part of the individual's broader response to health-related challenges. The theory was subsequently reconceptualised to explain how people may adapt to continuing uncertainty in chronic illness, including through changes in appraisal and the development of new ways of interpreting their circumstances (Mishel, 1988, 1990).

Recent theoretical work has revisited the application of Mishel's theory to chronic illness. Eppel-Meichlinger et al. (2024) examined how uncertainty develops and changes over time, focusing on concepts such as probabilistic thinking and self-organisation. Their work is relevant because it highlights that people living with chronic conditions may not experience uncertainty in a fixed or uniform way. Some individuals may gradually develop strategies to live with unpredictability, while others may continue to interpret uncertainty as threatening. This suggests that the relationship between illness uncertainty and well-being may depend partly on the individual's psychological response and coping resources.

An integrative review by Skojec et al. (2025) examined the relationship between uncertainty in illness and psychological adjustment to chronic illness. The authors identified uncertainty appraisal and coping strategies as important factors influencing adjustment. Their review indicated that people with chronic illness may experience greater uncertainty alongside poorer psychological adjustment, while also identifying the need for a better understanding of the processes involved. This provides a direct rationale for examining anxiety as one possible explanatory process rather than treating illness uncertainty and psychological well-being as two unrelated outcomes.

Anxiety is characterised by persistent worry, apprehension and heightened anticipation of possible threats. In the context of chronic illness,

anxiety may arise from uncertainty about symptom progression, treatment outcomes, future disability, financial demands or the possibility of further complications. The relationship between uncertainty and anxiety is also consistent with cognitive models of worry. Dugas et al. (1998) proposed that intolerance of uncertainty plays an important role in generalised anxiety, while Buhr and Dugas (2002) developed a measure to assess this construct. Carleton et al. (2007a) developed a short version of the Intolerance of Uncertainty Scale, and Carleton et al. (2007b) examined the relationship between anxiety sensitivity and intolerance of uncertainty. However, intolerance of uncertainty and illness uncertainty are not identical constructs. The former concerns a person's general difficulty tolerating uncertain situations, whereas the latter concerns uncertainty arising specifically from illness-related experiences. The proposed study will therefore measure illness uncertainty directly rather than substituting a general intolerance-of-uncertainty measure.

Evidence from chronic disease populations also indicates that uncertainty-related psychological difficulties deserve attention. Zhang et al. (2025), studying people with inflammatory bowel disease, reported significant associations between intolerance of uncertainty and mental health outcomes and examined maladaptive coping as a mediating process. Although this research is relevant to the wider relationship between uncertainty and mental health, it should not be interpreted as direct evidence that anxiety mediates the relationship between illness uncertainty and well-being, because its focus was intolerance of uncertainty and coping rather than the model proposed here. To the authors' knowledge as reflected in the sources reviewed, studies testing anxiety as a longitudinal mediator between illness-specific uncertainty and positive well-being across different chronic conditions in the UK remain limited, which is the gap the present study addresses.

3. Theoretical and Conceptual Framework

The study primarily be guided by Mishel's Uncertainty in Illness Theory (Mishel, 1981, 1988, 1990). The theory provides a direct explanation of how people interpret illness-related events when information is incomplete, ambiguous or unpredictable. It is particularly appropriate for chronic illness because uncertainty may continue throughout diagnosis, treatment, symptom management and changes in health status. The theory also recognises that individuals differ in how they appraise uncertainty and respond to it.

The transactional model of stress and coping will provide a complementary explanation of the proposed role of anxiety (Lazarus & Folkman, 1984). Within this perspective, illness uncertainty may be appraised as a threat when individuals believe that they have limited ability to predict or manage future health events. Anxiety may represent one psychological response to this appraisal. If anxiety persists, it may be associated with reduced positive well-being. Social support and coping resources may influence the strength of these relationships, although the primary mediation model will focus on illness uncertainty, anxiety and well-being.

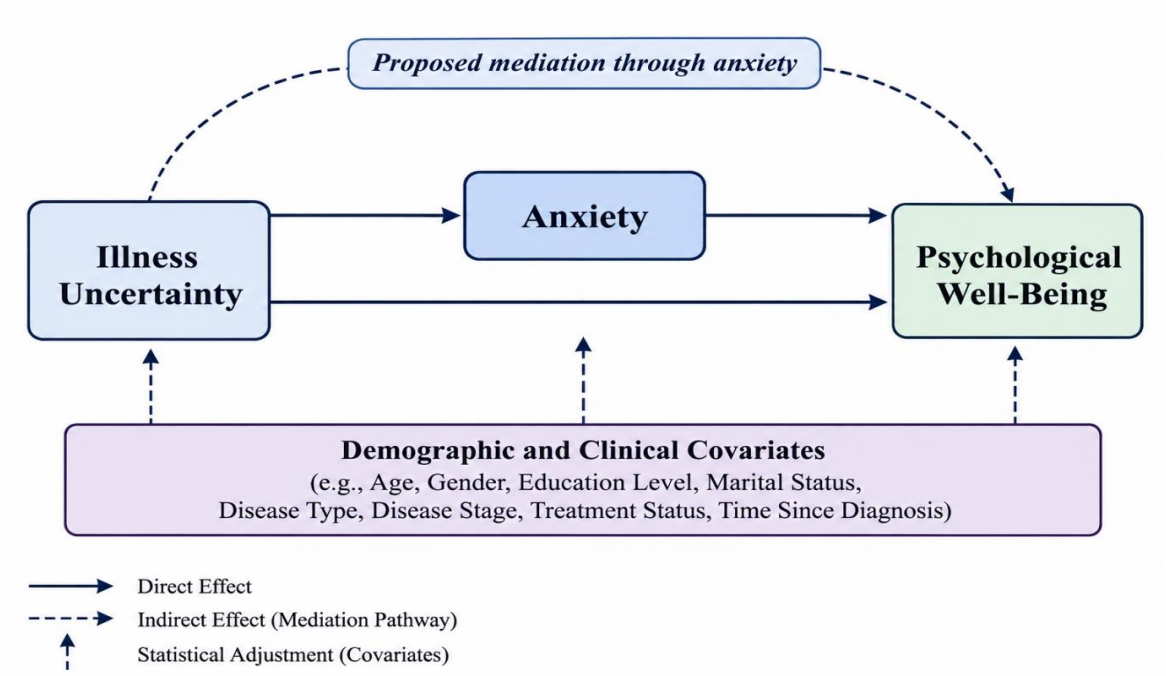

Figure 1 Proposed Conceptual Framework

Table 1 Hypotheses and Planned Statistical Tests

Hypothesis	Statement	Parameter tested	Planned test
H1	Baseline illness uncertainty predicts higher anxiety at 3 months, controlling for baseline anxiety	Path a (X at T1 → M at T2)	Path coefficient with 95% CI and Wald z test
H2	Anxiety at 3 months predicts lower well-being at 6 months, controlling for baseline well-being and illness uncertainty	Path b (M at T2 → Y at T3)	Path coefficient with 95% CI and Wald z test
H3	Baseline illness uncertainty is associated with lower well-being at 6 months	Total effect c and direct effect c′	Regression or path coefficients with 95% CI
H4	Anxiety statistically mediates the uncertainty–well-being association	Indirect effect a × b	Bootstrap percentile or bias-corrected 95% CI

X = illness uncertainty; M = anxiety; Y = psychological well-being; T1 = baseline; T2 = three months; T3 = six months. CI = confidence interval.

4. Methodology

The study uses a quantitative, longitudinal observational design involving three waves of data collection over six months. This design is appropriate because the research seeks to examine relationships between measurable psychological constructs and assess whether the proposed mediator occurs temporally between the predictor and outcome. A cross-sectional design would be less suitable because it would measure all variables at one time and provide limited evidence about temporal ordering. The study will be reported in accordance with the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidance (von Elm et al., 2007). The three-month interval between waves is proposed because it is long enough for changes in symptoms, treatment and appraisal to occur in many chronic conditions while remaining short enough to limit attrition;

this interval will be justified further in the final protocol.

The target population will comprise adults aged 18 years and above living in the United Kingdom who have received a diagnosis of a physical chronic health condition, defined as one that has lasted or is expected to last for at least 12 months. Participants will need sufficient English-language ability to complete the study measures. The study will aim to include participants with different chronic conditions rather than restricting recruitment to a single diagnosis, while recording diagnosis type and disease-related characteristics for analysis. The eligibility criteria are summarised in Table 2.

Table 2 Eligibility Criteria

Criterion type	Criterion	Rationale
Inclusion	Aged 18 years or over	Adult population with capacity to consent
Inclusion	Resident in the United Kingdom	UK-focused evidence
Inclusion	Diagnosed physical chronic condition lasting or expected to last at least 12 months	Consistent with the definition of longstanding illness used in national surveys
Inclusion	Sufficient English to complete questionnaires	Measures will be administered in English
Inclusion	Provides informed consent	Ethical requirement
Exclusion	Acute health episode preventing informed consent or meaningful participation at recruitment	Participants may be re-approached when stable
Exclusion	Primary condition that is solely a mental health diagnosis	The study concerns psychological responses to physical chronic illness

Participants recruited through appropriate NHS or clinical research routes, patient organisations, community networks and online advertisements, subject to institutional permissions and, where NHS recruitment is used, Health Research Authority approval through the Integrated Research Application System. Recruitment materials will explain the study purpose, eligibility criteria, time commitment and voluntary nature of participation. The study protocol will be preregistered on a public repository such as the Open Science Framework before data collection begins.

The required sample size will be estimated before recruitment using a power analysis or Monte Carlo simulation for the proposed longitudinal mediation model, following established guidance on sample size for mediation analysis (Fritz & MacKinnon, 2007). Table 3 lists the inputs that will be specified. Because mediation effects can require larger samples than simple associations, particularly when the indirect effect is small, the calculation will be based on conservative effect-size assumptions. The recruitment target will then be inflated to allow for attrition using Equation 1, in which N(required) is the sample size needed at the final wave and A is the anticipated proportion lost to follow-up. A final target number will be stated only once these assumptions have been justified and the calculation has been completed.

$$N_{target} = \left\lceil \frac{N_{required}}{1-A} \right\rceil \quad (1)$$

Table 3 Inputs for the A Priori PowerAnalysis

Input	Specification	Source of assumption
Model	Longitudinal path model with one mediator and baseline-adjusted paths	Study design
Standardised path a	Smallest effect of theoretical interest, set conservatively	Published associations between uncertainty and anxiety-related outcomes; sensitivity range
Standardised path b	Smallest effect of theoretical interest, set conservatively	Published associations between anxiety and well-being; sensitivity range
Direct effect c′	Set to a small value consistent with partial mediation	Theoretical expectation
Significance level	$\alpha = .05$ (two-sided)	Convention
Target power	$1 - \beta = .80$ or higher for the indirect effect	Convention
Anticipated attrition (A)	Estimated from comparable UK longitudinal studies of chronic illness	Literature and pilot recruitment data
Number of covariates	Covariates listed in Table 5	Analysis plan
Method	Monte Carlo simulation with bootstrap confidence intervals	Fritz and MacKinnon (2007)

Illness uncertainty measured using an appropriate version of the Mishel Uncertainty in Illness Scale, such as the adult or community form, with the final version selected after reviewing its suitability for adults with different chronic conditions, its validation evidence, scoring requirements and permissions for use. The scale is relevant because it assesses uncertainty arising from illness-related experiences rather than general uncertainty in everyday life (Mishel, 1981). Anxiety will be measured using the Generalised Anxiety Disorder-7 (GAD-7), a seven-item measure of anxiety symptoms over the preceding two weeks. Spitzer et al. (2006) reported evidence supporting its use as a brief screening measure, including sensitivity of 89% and specificity of 82% at a cut-off score of 10 in the original primary-care validation study. These screening properties do not mean that the scale establishes a clinical diagnosis in this research. Psychological well-being will be assessed using the 14-item WEMWBS, which measures positive mental well-being, including aspects of positive affect and psychological functioning. Tennant et al. (2007) reported good internal consistency and test–retest reliability in its validation work. Depressive symptoms will be measured at baseline using the Patient Health Questionnaire-9 (PHQ-9; Kroenke et al., 2001) and entered as a covariate, because depression overlaps with both anxiety and well-being and could otherwise confound the proposed pathways. The measures are summarised in Table 4.

Table 4 Proposed Measures

Construct	Instrument	Structure and scoring	Direction of scores	Role in model
Illness uncertainty	Appropriate validated version of the Mishel Uncertainty in Illness Scale	Likert-type items summed to a total; item count and range depend on the version confirmed before protocol finalisation	Higher = more uncertainty	Independent variable (X)
Anxiety	GAD-7	7 items, 4-point response; total 0–21	Higher = more anxiety	Mediator (M)
Psychological well-being	WEMWBS	14 items, 5-point response; total 14–70	Higher = better well-being	Dependent variable (Y)
Depressive symptoms	PHQ-9	9 items, 4-point response; total 0–27	Higher = more depressive symptoms	Covariate
Demographic and clinical characteristics	Study-specific questionnaire	Categorical and continuous items	Not applicable	Covariates and sample description

The final Mishel scale version must be confirmed for the intended population. The GAD-7, WEMWBS and PHQ-9 will be administered and scored according to their published guidance (Kroenke et al., 2001; Spitzer et al., 2006; Tennant et al., 2007). Licensing and registration requirements will be met before use.

Total scores will be calculated by summing item responses, as shown in Equations 2 and 3, where x_i is the response to item i. For the GAD-7 the total ranges from 0 to 21, and for the WEMWBS from 14 to 70. Published severity bands will be used only to describe the sample and will not replace the continuous scores in the main models (Table 6).

$$GAD_{total} = \sum_{i=1}^{7} x_i \quad (2)$$

$$WEMWBS_{total} = \sum_{i=1}^{14} x_i \quad (3)$$

Table 5 Score Ranges and Descriptive Bands for Anxiety and Depressive Symptoms

Score range	GAD-7 band	PHQ-9 band	Use in the study
0–4	Minimal anxiety	Minimal depressive symptoms	Descriptive reporting only
5–9	Mild anxiety	Mild depressive symptoms	Descriptive reporting only
10–14	Moderate anxiety	Moderate depressive symptoms	Descriptive reporting; GAD-7 cut-off of 10 for screening description
15–21	Severe anxiety	Moderately severe depressive symptoms (15–19)	Descriptive reporting only
22–27	Not applicable (GAD-7 maximum is 21)	Severe depressive symptoms (20–27)	Descriptive reporting only

Bands follow the cut-points reported in the original GAD-7 and PHQ-9 validation studies (Kroenke et al., 2001; Spitzer et al., 2006). The WEMWBS has a range of 14–70 and is analysed as a continuous score.

Data will be collected at baseline, three months and six months, as shown in Figure 2 and Table 7. At baseline, participants will complete all principal measures, the PHQ-9 and demographic and clinical questions. At three months and six months, participants will repeat the illness uncertainty, anxiety and well-being measures, so that baseline scores can be controlled and reciprocal pathways can be examined. The demographic and clinical covariates are listed in Table 5.

Table 6 Covariates, Measurement and Coding

Covariate	Measurement	Coding in analysis	Time of measurement
Age	Years	Continuous	Baseline
Gender	Self-reported	Categorical	Baseline
Ethnicity	Self-reported, UK census-style categories	Categorical	Baseline
Educational attainment	Highest qualification	Ordinal	Baseline
Employment status	Self-reported	Categorical	Baseline
Socioeconomic circumstances	Household income or an appropriate alternative indicator	Ordinal or continuous	Baseline
Diagnosis type	Self-reported primary condition	Categorical (condition group)	Baseline
Number of long-term conditions	Count	Continuous	Baseline
Time since diagnosis	Years	Continuous	Baseline
Symptom severity or activity limitation	Brief validated item or scale to be specified	Ordinal or continuous	Baseline and follow-up
Chronic pain	Presence and intensity	Categorical or continuous	Baseline and follow-up
Perceived social support	Brief validated scale to be specified	Continuous	Baseline
Depressive symptoms	PHQ-9	Continuous (0–27)	Baseline

Covariates will be selected a priori from the theoretical framework and entered according to the preregistered analysis plan.

Table 7 Planned Data Collection Schedule

Wave	Illness uncertainty	Anxiety	Psychological well-being	Depressive symptoms	Main analytical purpose
T1: Baseline	Yes	Yes	Yes	Yes	Describe the sample and provide baseline adjustment
T2: Three months	Yes	Yes	Yes	No	Provide the mediator and test reciprocal paths
T3: Six months	Yes	Yes	Yes	No	Provide the outcome and longitudinal associations

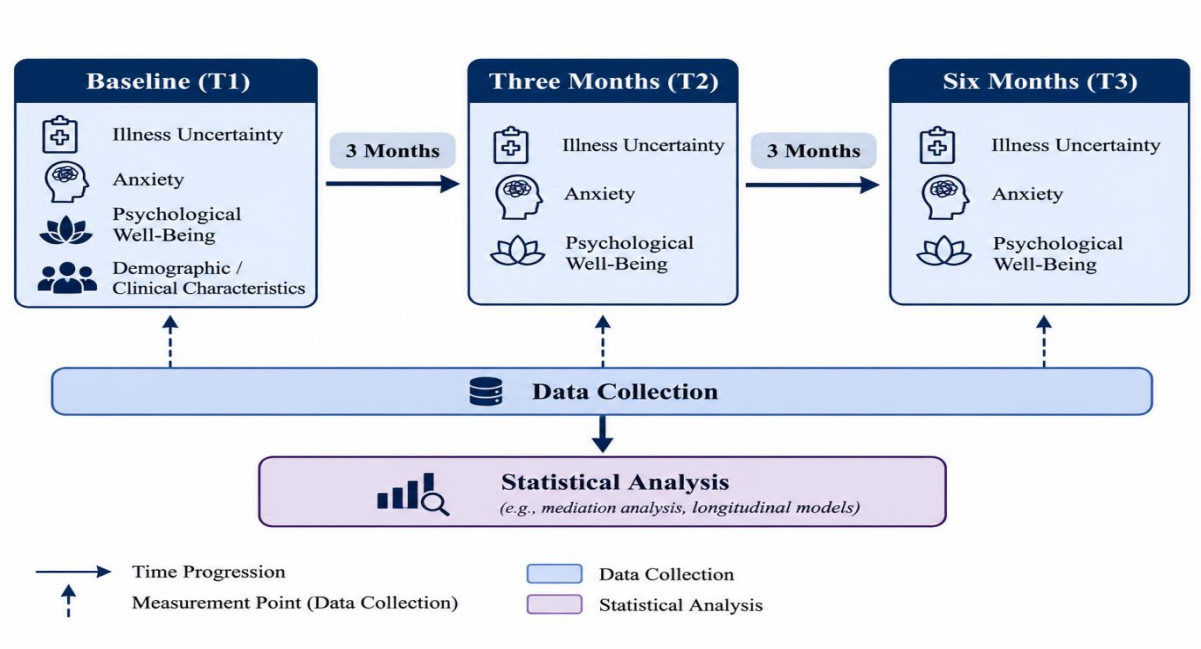

Figure 2 Proposed Longitudinal Data-Collection Schedule

The primary analysis begin with descriptive statistics to summarise participant characteristics and the distribution of the main study variables. Continuous variables will be described using means and standard deviations, or medians and interquartile ranges where distributions are substantially skewed. Categorical variables will be presented as frequencies and percentages. Bivariate associations be explored using Pearson's correlation coefficient (Equation 5) or Spearman's rank correlation coefficient (Equation 6), depending on the distribution and measurement characteristics of the variables, where d_i is the difference between the ranks of paired observations and n is the number of pairs. Longitudinal mediation then be examined using path analysis or structural equation modelling. The analysis will estimate the association between baseline illness uncertainty and subsequent anxiety, and the association between anxiety and later psychological well-being, while including baseline anxiety and baseline well-being to account for initial differences. The two regression equations are given in Equations 7 and 8, in which X is illness uncertainty, M is anxiety, Y is psychological well-being, C is the vector of covariates, and t1, t2 and t3 are the The total association is estimated from a model that omits the mediator (Equation 9), and the total, direct and indirect associations are related by Equation 10. The indirect association is the

Internal consistency will be examined for each multi-item measure using Cronbach's (1951) alpha, calculated as in Equation 4, where k is the number of items, σ^2_i is the variance of item i and $\sigma^2(T)$ is the variance of the total score.

$$\alpha = \frac{k}{k-1}\left(1 - \frac{\sum_{i=1}^{k}\sigma^2_i}{\sigma^2_T}\right) \quad (4)$$

Magnitudes will be interpreted using conventional benchmarks (Cohen, 1988; Table 9).

$$r = \frac{\sum_{i=1}^{n}(x_i-\bar{x})(y_i-\bar{y})}{\sqrt{\sum_{i=1}^{n}(x_i-\bar{x})^2\sum_{i=1}^{n}(y_i-\bar{y})^2}} \quad (5)$$

$$r_s = 1 - \frac{6\sum_{i=1}^{n} d_i^2}{n(n^2-1)} \quad (6)$$

three measurement occasions. Path a estimates the association between baseline illness uncertainty and anxiety at three months, controlling for baseline anxiety (φ). Path b estimates the association between anxiety at three months and well-being at six months, controlling for illness uncertainty and baseline well-being (ρ). The coefficient c′ is the direct association with anxiety in the model, and ε denotes residual error.

$$M_{t2} = i_M + aX_{t1} + \varphi M_{t1} + \gamma C + \varepsilon_M \quad (7)$$

$$Y_{t3} = i_Y + c'X_{t1} + bM_{t2} + \rho Y_{t1} + \delta C + \varepsilon_Y \quad (8)$$

product of paths a and b (Equation 11), and the proportion of the total association attributable to the indirect pathway is given by Equation 12. The proportion mediated will be interpreted

cautiously, particularly when c′ and ab have opposite signs or the total effect is small.

$$Y_{t3}=i_{Y'}+cX_{t1}+\rho'Y_{t1}+\delta'C+\varepsilon_{Y'} \quad (9)$$

$$c=c'+ab \quad (10)$$

Each path coefficient ($\hat{\theta}$) will be tested using a Wald statistic (Equation 13), where SE is its standard error. Because the sampling distribution of the product ab is typically asymmetric, the indirect association will be evaluated using a nonparametric bootstrap with B resamples, taking the percentile interval in Equation 14 as the confidence interval, where the lower and upper limits are the $\alpha/2$ and $1-\alpha/2$ percentiles of the bootstrap distribution of ab and $\alpha = .05$ (Preacher & Hayes, 2008; Hayes, Model fit evaluated using the indices and thresholds in Table 8, and effect sizes will be interpreted using the benchmarks in Table 9.

$$\text{Indirect association}=a\times b \quad (11)$$

$$P_M=\frac{ab}{c'+ab} \quad (12)$$

2022). The indirect association will be regarded as statistically supported when this interval excludes zero. Where regression models are used, explanatory power will be summarised using R^2 and Cohen's f^2 (Equation 15; Cohen, 1988).

$$z=\frac{\hat{\theta}}{SE(\hat{\theta})} \quad (13)$$

$$CI=\left[ab_{\alpha/2},ab_{1-\alpha/2}\right] \quad (14)$$

$$f^2=\frac{R^2}{1-R^2} \quad (15)$$

Because the study is observational, coefficients will be interpreted as statistical associations rather than definitive causal effects.

Table 8 Model Fit Indices and Interpretation Criteria

Index	Criterion for acceptable fit	Purpose
Comparative fit index (CFI)	≥ .95 (good); ≥ .90 (acceptable)	Compares the proposed model with a baseline model
Tucker–Lewis index (TLI)	≥ .95 (good); ≥ .90 (acceptable)	Penalises model complexity
Root mean square error of approximation (RMSEA)	≤ .06 (good); ≤ .08 (acceptable), reported with 90% CI	Assesses approximate fit per degree of freedom
Standardised root mean square residual (SRMR)	≤ .08	Summarises average residual discrepancy
Chi-square test (χ^2)	Reported with degrees of freedom and p	Tests exact fit; sensitive to sample size

Thresholds follow Hu and Bentler (1999) and will be used as guidelines rather than strict cut-offs. A fully saturated path model has perfect fit by definition, in which case the indirect-effect estimates, not fit indices, will be the primary evidence.

Table 9 Benchmarks for Interpreting Effect Sizes

Statistic	Small	Medium	Large
Correlation coefficient (r)	≈ .10	≈ .30	≈ .50
Cohen's f^2	≈ .02	≈ .15	≈ .35
Standardised mean difference (d)	≈ .20	≈ .50	≈ .80
Standardised path coefficient (β)	Interpreted alongside the 95% CI and the clinical meaning of the scale difference	Interpreted alongside the 95% CI and the clinical meaning of the scale difference	Interpreted alongside the 95% CI and the clinical meaning of the scale difference

Benchmarks follow Cohen (1988) and are conventions rather than substantive thresholds; effect sizes will be interpreted in context.

5. Discussion

The proposed study addresses an important question in chronic illness research: whether anxiety helps explain the relationship between illness uncertainty and psychological well-being. Its central contribution is to examine these constructs within one longitudinal model among adults with different chronic conditions in the UK. Previous research has established the theoretical importance of uncertainty in illness and has identified links between chronic illness and psychological adjustment (Mishel, 1988; Skojec et al., 2025). However, further work is needed to examine the temporal relationship between illness uncertainty, anxiety and positive well-being.

If the proposed hypotheses are supported, the findings would suggest that anxiety is one relevant psychological process connecting illness uncertainty with later well-being. Such a result would be consistent with Mishel's theory and the transactional model of stress and coping. It would also suggest that support for people with chronic illness should address not only the provision of medical information but also the emotional responses that may arise when health outcomes remain unpredictable. However, the study may also find that the indirect association is small or statistically uncertain. Such a finding would still be informative because it would indicate that anxiety may not fully account for the relationship and that other mechanisms require investigation.

The findings could have implications for clinical practice. Healthcare professionals may need to recognise that uncertainty can arise even when patients receive appropriate treatment and information. Clear communication, consistent explanations, shared decision-making and opportunities to discuss concerns may help patients understand their condition and treatment options. Where anxiety is identified, appropriate assessment and referral pathways may be beneficial. The proposed study will not test a clinical intervention, so recommendations about the effectiveness of specific interventions would require separate evaluation.

The study may also contribute to the development of more integrated chronic disease services. Physical and psychological health are closely associated, and UK survey evidence indicates that people with activity-limiting physical conditions report common mental health conditions at higher rates than people without such limitations (NHS England Digital, 2025). The proposed research could help clarify one psychological pathway relevant to this association. It may also support more person-centred approaches that consider patients' understanding of illness, emotional needs and positive well-being alongside clinical indicators.

6. Implications

The research may contribute to theory by examining anxiety as a potential mediator within the framework of illness uncertainty. Mishel's theory provides a foundation for understanding uncertainty, while the transactional model explains how appraisal and coping may shape psychological responses. Bringing these perspectives together may help clarify how uncertainty relates to positive well-being over time.

For healthcare practice, the study may highlight the value of identifying uncertainty and anxiety during routine chronic disease management. Clinicians could consider whether patients understand the purpose of treatment, what changes in symptoms may mean and when they should seek further advice. For health services, the findings may support closer integration between physical healthcare and psychological support. For future research, the study may provide a basis for testing interventions designed to improve illness-related understanding, reduce avoidable uncertainty and strengthen psychological well-being.

7. Limitations

The proposed study will have limitations. First, an observational design cannot establish that illness uncertainty causes anxiety or that anxiety causes changes in psychological well-being. Longitudinal measurement will improve temporal ordering, but unmeasured confounding and reciprocal relationships may remain, and the reciprocal-effects analyses in Table 10 will be exploratory. Second, reliance on self-report measures may introduce recall bias,

response bias and common-method variance. Third, anxiety and well-being measures may be correlated because of conceptual and item overlap, and the GAD-7 is not illness-specific, so any mediation finding will need to be interpreted with caution. Fourth, recruiting participants with different chronic conditions may increase relevance across conditions, but disease-specific experiences may differ substantially. Diagnosis type, symptom severity, treatment burden and duration of illness will therefore be considered in the analysis.

Fifth, participant attrition across three waves may affect the representativeness of the final sample. People experiencing greater illness burden or psychological distress may be more likely to miss follow-up assessments, so attrition will be monitored and handled with an appropriate missing-data strategy. Sixth, if recruitment is limited to English-speaking participants, the findings may not represent people who experience language barriers when accessing healthcare. Seventh, self-reported diagnoses may not be verified against clinical records. Finally, the selection of the Mishel scale version will require careful consideration because the instrument must be appropriate for a heterogeneous chronic illness population. These limitations will be addressed through transparent reporting, sensitivity analyses and cautious interpretation.

8. Conclusion

This proposed study will examine whether anxiety mediates the relationship between illness uncertainty and psychological well-being among adults living with chronic illness in the UK. Drawing on Mishel's Uncertainty in Illness Theory and the transactional model of stress and coping, it will use a three-wave longitudinal observational design to assess the relationships between illness uncertainty, anxiety and positive psychological well-being. The study will use established measures, collect relevant demographic and clinical information, and apply longitudinal mediation analysis with appropriate adjustment for baseline scores and potential confounders. By examining these constructs together, the research may provide useful evidence for more person-centred chronic disease care that recognises the psychological consequences of uncertainty as well as the physical demands of long-term illness.

REFERENCES

Buhr, K., & Dugas, M. J. (2002). The Intolerance of Uncertainty Scale: Psychometric properties of the English version. Behaviour Research and Therapy, 40(8), 931–945. https://doi.org/10.1016/S0005-7967(01)00092-4

Carleton, R. N., Norton, M. A. P. J., & Asmundson, G. J. G. (2007a). Fearing the unknown: A short version of the Intolerance of Uncertainty Scale. Journal of Anxiety Disorders, 21(1), 105–117. https://doi.org/10.1016/j.janxdis.2006.03.014

Carleton, R. N., Sharpe, D., & Asmundson, G. J. G. (2007b). Anxiety sensitivity and intolerance of uncertainty: Requisites of the fundamental fears? Behaviour Research and Therapy, 45(10), 2307–2316. https://doi.org/10.1016/j.brat.2007.04.006

Cohen, J. (1988). Statistical power analysis for the behavioral sciences (2nd ed.). Lawrence Erlbaum Associates.

Cohen, S., & Wills, T. A. (1985). Stress, social support, and the buffering hypothesis. Psychological Bulletin, 98(2), 310–357. https://doi.org/10.1037/0033-2909.98.2.310

Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. Psychometrika, 16(3), 297–334. https://doi.org/10.1007/BF02310555

Dugas, M. J., Gagnon, F., Ladouceur, R., & Freeston, M. H. (1998). Generalized anxiety disorder: A preliminary test of a conceptual model. Behaviour Research and Therapy, 36(2), 215–226. https://doi.org/10.1016/S0005-7967(97)00070-3

Eppel-Meichlinger, J., Kobleder, A., & Mayer, H. (2024). Refining Mishel's reconceptualized uncertainty in illness theory: Explaining the development of uncertainty in chronic illness. Research and Theory for Nursing Practice, 38(2), 171–192. https://doi.org/10.1891/RTNP-2023-0068

Fritz, M. S., & MacKinnon, D. P. (2007). Required sample size to detect the mediated effect. Psychological Science, 18(3), 233–239. https://doi.org/10.1111/j.1467-9280.2007.01882.x

Hamaker, E. L., Kuiper, R. M., & Grasman, R. P. P. P. (2015). A critique of the cross-lagged panel model. Psychological Methods, 20(1), 102–116. https://doi.org/10.1037/a0038889

Hayes, A. F. (2022). Introduction to mediation, moderation, and conditional process analysis: A regression-based approach (3rd ed.). Guilford Press.

Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. Structural Equation Modeling, 6(1), 1–55. https://doi.org/10.1080/10705519909540118

Kroenke, K., Spitzer, R. L., & Williams, J. B. W. (2001). The PHQ-9: Validity of a brief depression severity measure. Journal of General Internal Medicine, 16(9), 606–613. https://doi.org/10.1046/j.1525-1497.2001.016009606.x

Lazarus, R. S., & Folkman, S. (1984). Stress, appraisal, and coping. Springer.

Maxwell, S. E., & Cole, D. A. (2007). Bias in cross-sectional analyses of longitudinal mediation. Psychological Methods, 12(1), 23–44. https://doi.org/10.1037/1082-989X.12.1.23

Mishel, M. H. (1981). The measurement of uncertainty in illness. Nursing Research, 30(5), 258–263. https://doi.org/10.1097/00006199-198109000-00002

Mishel, M. H. (1984). Perceived uncertainty and stress in illness. Research in Nursing & Health, 7(3), 163–171. https://doi.org/10.1002/nur.4770070304

Mishel, M. H. (1988). Uncertainty in illness. Image: The Journal of Nursing Scholarship, 20(4), 225–232. https://doi.org/10.1111/j.1547-5069.1988.tb00082.x

Mishel, M. H. (1990). Reconceptualization of the uncertainty in illness theory. Image: The Journal of Nursing Scholarship, 22(4), 256–262. https://doi.org/10.1111/j.1547-5069.1990.tb00225.x

NHS England Digital. (2025). Adult psychiatric morbidity survey: Survey of mental health and wellbeing, England, 2023/24. https://digital.nhs.uk/data-and-information/publications/statistical/adult-psychiatric-morbidity-survey/survey-of-mental-health-and-wellbeing-england-2023-24

NHS England Digital. (2026). Health Survey for England, 2024: Adults' health. https://digital.nhs.uk/data-and-information/publications/statistical/health-survey-for-england/2024/adults-health

Preacher, K. J., & Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. Behavior Research Methods, 40(3), 879–891. https://doi.org/10.3758/BRM.40.3.879

Rakshasa-Loots, A. M., Swiffen, D., Steyn, C., Marwick, K. F. M., & Smith, D. J. (2025). Affective disorders and chronic inflammatory conditions: Analysis of 1.5 million participants in Our Future Health. BMJ Mental Health, 28(1), Article e301706. https://doi.org/10.1136/bmjment-2025-301706

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Ryff, C. D., & Keyes, C. L. M. (1995). The structure of psychological well-being revisited. Journal of Personality and Social Psychology, 69(4), 719–727. https://doi.org/10.1037/0022-3514.69.4.719

Skojec, T. A., Davidson, T. M., & Kelechi, T. J. (2025). The relationship between uncertainty in illness and psychological adjustment to chronic illness. Journal of Health Psychology, 30(4), 622–637. https://doi.org/10.1177/13591053241249861

Spitzer, R. L., Kroenke, K., Williams, J. B. W., & Löwe, B. (2006). A brief measure for assessing generalized anxiety disorder: The GAD-7. Archives of Internal Medicine, 166(10), 1092–1097. https://doi.org/10.1001/archinte.166.10.1092

Tennant, R., Hiller, L., Fishwick, R., Platt, S., Joseph, S., Weich, S., Parkinson, J., Secker, J., & Stewart-Brown, S. (2007). The Warwick–Edinburgh Mental Well-being Scale (WEMWBS): Development and UK validation. Health and Quality of Life Outcomes, 5, Article 63. https://doi.org/10.1186/1477-7525-5-63

von Elm, E., Altman, D. G., Egger, M., Pocock, S. J., Gøtzsche, P. C., & Vandenbroucke, J. P. (2007). The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement: Guidelines for reporting observational studies. PLoS Medicine, 4(10), Article e296. https://doi.org/10.1371/journal.pmed.0040296

Zhang, X., Ta, N., Yi, S., & Xiong, H. (2025). Intolerance of uncertainty and mental health in patients with inflammatory bowel disease: The mediating role of maladaptive coping. Scientific Reports, 15, Article 6464. https://doi.org/10.1038/s41598-025-86600-z

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