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How coping strategy bridges the gap: Self-efficacy as a key to treatment adherence

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Abstract

Chronic illness management often requires long-term adherence to treatment regimens, yet many patients struggle to maintain consistent adherence. While there is substantial evidence on the role of self-efficacy in promoting adherence, less is known about how coping strategies influence this relationship. This study investigated the mediating role of coping strategies in the relationship between self-efficacy and treatment adherence among chronic patients in Nigeria. Participants were 398 chronic patients (62% female), aged 21-65 years (M = 54.71; SD = 9.45), with conditions including hypertension (37%), dyslipidemia (31%), diabetes (20%), and COPD (12%). They responded to the Chronic Pain Self-Efficacy Scale, the Brief-COPE Inventory, and the Morisky Medication Adherence Scale. Following the mediation framework proposed by Baron and Kenny (1986), a series of regression analyses were conducted. Results of data analysis showed that self-efficacy was significantly associated with treatment adherence ((B = 0.58, β = .42, p < .001). Coping strategies were significantly associated with treatment adherence (B = 0.47, β = .38, p < .001). Findings also indicated that coping strategies served as a pathway through which self-efficacy was linked to adherence (B = 0.28, β = .18, p < .001). These findings suggest that adaptive coping strategies not only directly improve adherence but also enhance self-efficacy, which further promotes adherence. The study highlights the importance of addressing both coping strategies and self-efficacy in interventions aimed at improving treatment adherence among chronic patients.

Keywords: Adherence to treatment, Chronic patients, Coping mechanism, Self-efficacy

1. Introduction

Adherence to health treatments has been an issue of social concern for many decades (Méndez & Muñoz, 2011; Serrano-Castro et al., 2011; Zeber et al., 2013; Martos-Méndez, 2015; Deng et al., 2022; Pedretti et al., 2023; Kardas, 2024). Progress in medical science, better nutrition, enhanced living standards, and improved hygiene

have collectively contributed to the successful control of many infectious diseases. Additionally, the creation of effective preventive tools like vaccines and curative treatments such as antibiotics has played a crucial role in this achievement (Kardas, 2024). However, these changes have increased the number of people with long-term illnesses, functional limitations, and physical and psychological disabilities; that is, chronic patients (Smith et al., 2015).

There is evidence that health habits have a direct impact on the individual's health (Jackson et al., 2007). One of the most-studied health behaviours is treatment adherence or adherence behaviour. This can be defined as the extent to which a person's behaviour (taking medication, following a diet, making lifestyle changes, etc) coincides with the advice received regarding health and prescriptions (Epstein & Cluss, 1982; Rosner, 2006; Méndez & Muñoz, 2011). In the view of Horne et al. (2019), adherence describes a patient's active participation and willingness to follow a treatment plan that has been mutually agreed upon with a healthcare provider, aimed at achieving specific preventive or therapeutic goals. Likewise, the World Health Organization (2004) defines adherence as a complex, multidimensional issue influenced by five key factors: the healthcare system and team, the nature of the illness, socio-economic conditions, the prescribed treatment, and individual patient-related elements.

Following medical advice is crucial for individuals living with chronic illnesses. After diagnosis, they are often required to make significant adjustments to their lifestyle. This may involve adhering to a consistent medication schedule, taking drugs multiple times daily, or, for those with diabetes, administering insulin injections regularly (Gross et al., 2003). Moreover, maintaining overall well-being places greater emphasis on healthy eating habits and routine physical activity (Hayes, 2002). Patients with chronic diseases should adopt behaviours that promotes or protects health. In other words, patients are advised to adopt healthier lifestyle habits, which include eating a balanced diet, engaging in regular physical activity, and avoiding harmful behaviors such as smoking and alcohol consumption (Ferrer, 1995). Therefore, the extent to which the patient feels able to carry out these changes will be crucial to developing these behaviours and ultimately hindering their treatment (Granados et al., 2007). It is based on this backdrop that the present study seeks to ascertain if coping strategy mediate the relationship between self-efficacy and adherence to treatment among patients with chronic illness.

2. Literature review

2.1. Self-efficacy and health behavior

One of the cognitive variables with the most influence on people's behaviour appears to be self- efficacy. Various theoretical models identify self-efficacy as a key element influencing treatment adherence. For example, the Attitude, Social Influence, and Self-Efficacy (ASE) model proposes that a patient is more likely to adhere to medication when they hold favorable beliefs about treatment, are influenced by a supportive social environment, and possess the confidence in their own ability to consistently follow the prescribed regimen (Fernández et al., 2003). In addition, the well- known Health Belief Model (HBM) (Becker, & Mainman, 1975; Rosenstock, 1974) also incorporates the construct of perceived self-efficacy to explain health protective or preventative behaviour (Strecher, & Rosenstock, 1997). Nevertheless, Bandura's Self-efficacy Theory, set within Social Cognitive Theory (Bandura, 1977), provides the greatest support for the relationship between self-efficacy and health behaviours (Bandura, 2005).

Self-efficacy refers to the belief or beliefs a person holds in terms of their own ability to successfully perform the behaviour required to produce certain outcomes (Bandura, 1999). In the context of this study, a chronic illness patient who believes in their ability to follow medical advice such as taking prescribed medication, maintaining a healthy diet, and engaging in regular physical activity is more likely to adopt and sustain positive

health behaviors. A person's beliefs concerning self-regulation and their ability to implement this type of behaviour will be decisive. Individuals tend to be more driven when they believe they are capable of successfully carrying out a task when they trust in their own skills to control their actions (Connolly et al., 2013). This sense of self-efficacy can affect how a person feels, thinks, and stays motivated. A specific vulnerability or resistance to stress may exist depending on the level of self-efficacy and therefore this can affect their ability to adapt to the environmental and social demands (Bandura et al., 1999), as well as to the demands imposed by the experience of living with a chronic disease (Avendaño, & Barra, 2008). In this sense, treatment adherence behaviour has been positively associated with perceived self-efficacy (Chen et al., 2013); specifically, self-efficacy has received considerable attention as a predictor of treatment failure (Álvarez, & Barra, 2010).

The self-efficacy model has been successful in predicting health behaviors (Bandura, 1999). This model tends to significantly correlate with the health actions investigated in this study and is therefore a relevant element that contributes to the development of health actions, whether healthy or unhealthy. However, self-efficacy and health beliefs typically determine only some of the variations in health behaviour. Thus, beyond the direct links between self-efficacy and adherence to treatment, other potential mechanisms have been hypothesized through which the patient's beliefs on their capacity to act effectively could improve treatment adherence and thus health and wellbeing. One of these mechanisms is social support (Raggi et al., 2010). In fact, Bandura (1977) already suggested that human behaviour was the result of interactions between the self-system (personal variables such as self-efficacy) and external sources of influence (such as coping strategies), since the individual operates within a set of socio-cultural influences. Thus, coping strategies, as well as self-efficacy, can play a relevant role in the health behaviour of chronic patients. Although self-efficacy has a direct effect on health and treatment adherence, it seems reasonable to assume that coping strategies can influence this cognitive variable, such that the influence of self-efficacy beliefs on adherence behaviour may be mediated by the perceived coping strategies.

2.2. Coping mechanism and health behaviour

Coping mechanisms play a critical role in shaping health behaviour and influencing overall wellbeing, particularly among individuals managing chronic illnesses or navigating stressful life circumstances. Coping strategies, defined as the cognitive and behavioural efforts employed to manage specific demands appraised as taxing or exceeding one's resources (Lazarus & Folkman, 1984), are central to understanding how individuals adapt to health challenges. Effective coping strategies, such as problem-focused coping, emotional regulation, and positive reframing, have consistently been linked to better health outcomes, including improved treatment adherence, healthier lifestyle choices, and enhanced mental health (Carver & Connor-Smith, 2010; Taylor & Stanton, 2007). Conversely, maladaptive coping strategies, such as avoidance, denial, or substance use, are associated with poorer health behaviours, including non-adherence to medical regimens and increased engagement in risky health practices (Holahan et al., 1996).

Recent studies have emphasized the importance of adaptive coping strategies in promoting health behaviour. For instance, individuals who employ problem-solving strategies are more likely to adhere to prescribed treatments, engage in regular physical activity, and maintain balanced diets (Kato, 2015). Similarly, emotional regulation techniques, such as mindfulness and cognitive reappraisal, have been shown to reduce stress and improve health-related decision-making (Aldao et al., 2010). These findings underscore the role of coping mechanisms as a buffer against the psychological and behavioural challenges posed by chronic illness or other health-related stressors.

On the other hand, maladaptive coping strategies can exacerbate health problems and hinder treatment adherence. Avoidance coping, for example, has been linked to delayed medical help- seeking, poor medication

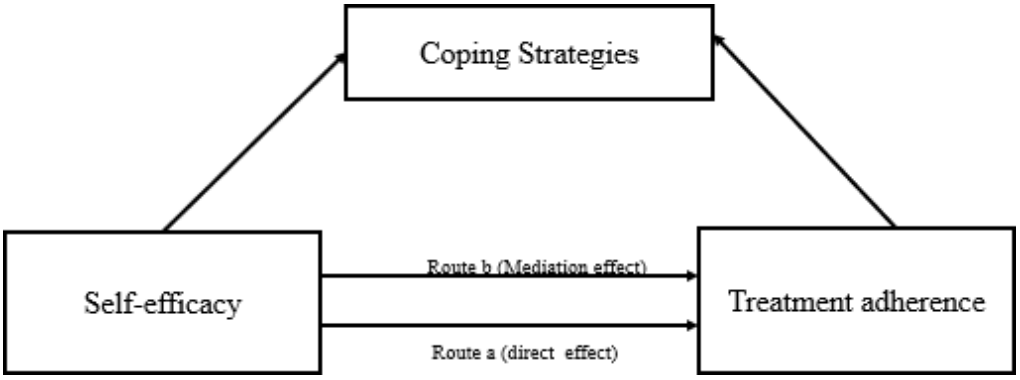
adherence, and unhealthy lifestyle choices (Sirois & Kitner, 2015). Individuals who rely on avoidance strategies often struggle to confront health-related challenges, leading to a cycle of neglect and worsening health outcomes. Similarly, emotional suppression, a maladaptive form of emotional regulation, has been associated with increased psychological distress and poorer physical health (Gross & John, 2003). These findings highlight the detrimental effects of ineffective coping mechanisms on health behaviour and overall wellbeing.

The relationship between coping mechanisms and health behaviour is further influenced by individual differences, such as self-efficacy and resilience. Self-efficacy, or an individual's belief in their ability to manage health-related tasks, has been identified as a key determinant of adaptive coping and health behaviour (Bandura, 1997). Individuals with high self-efficacy are more likely to employ problem-focused coping strategies and persist in the face of health challenges, leading to better treatment adherence and healthier lifestyles (Schwarzer & Warner, 2013). Resilience, defined as the capacity to recover from adversity, also plays a critical role in shaping coping strategies and health behaviour. Resilient individuals are more likely to use adaptive coping mechanisms, such as seeking social support or engaging in positive reframing, which in turn promote healthier behaviours (Southwick et al., 2014).

The novelty of this study lies in its focus on the relationship between coping strategies, self-efficacy, and health behaviour, particularly in the context of chronic illness. While coping mechanisms directly influence health behaviour, their effectiveness may be moderated by self-efficacy and other psychological factors. For instance, individuals with high self-efficacy are more likely to use adaptive coping strategies, such as problem-solving or seeking information, which enhance treatment adherence and promote healthier lifestyles (Farley, 2020). Conversely, those with low self-efficacy may rely on maladaptive coping strategies, such as avoidance or emotional suppression, which undermine health behaviour and exacerbate health problems (Quiceno & Vinaccia, 2013).

This indicates that there is a sufficient basis to investigate the role of coping strategies as a mediator apart from the known direct associations between health beliefs, coping strategies, and health behaviour (treatment adherence). Based on the above, the aim of this work is to test a mediational model to investigate novel associations between self-efficacy, coping strategies among chronic patients, and treatment adherence (healthy behaviour). Figure 1 shows the mediating model used in this study. Considering previous findings, we first examined the relationships between self- efficacy, coping strategies, and treatment adherence (medication, diet and physical exercise) in a sample of chronic patients. Second, in line with the proposed mediational model, we investigated whether coping strategies mediates self-efficacy and treatment adherence. Thus, it is hypothesized that self-efficacy is positively correlated with coping strategies, and negatively with nonadherence to treatment. In addition, it is predicted that there is a significant association between coping strategies and adherence to treatment. Finally, in line with the mediational model, it is hypothesized that the relationship between self-efficacy and nonadherence is mediated by the levels of coping strategies among chronic patients and their level of satisfaction with it.

Figure 1: Model of coping strategy as variable mediating self-efficacy and treatment adherence



3. Research method

3.1. Sample

The sample consisted of 398 chronic patients living in Nigeria. The participants' ages ranged from 21 to 65 years, with a mean age of 54.71 years (SD = 9.45). Of the total sample, 62% were women and 38% were men. In terms of medical conditions, 37% of the participants had hypertension, 31% had dyslipidemia, 20% had diabetes, and 12% had Chronic Obstructive Pulmonary Disease (COPD). This larger sample size provided a more robust basis for examining the relationships between coping strategies, self-efficacy, and health behaviour in chronic patients.

3.2. Instrument

Self-efficacy was measured using an adapted version of the Chronic Pain Self-Efficacy Scale with Nigerian people (Martín-Aragón et al., 1999), consisting of 10 items. In this instrument the patient values the capacity to manage different situations related to the disease. Responses range from 1 “completely unable” to 5 “completely able”. The higher the score, the higher the self-efficacy. Cronbach’s alpha was .78.

3.3. Coping strategies scale

Coping strategies were measured using the Brief-COPE Inventory (Carver, 1997), a widely validated and reliable tool for assessing coping mechanisms. The Brief-COPE consists of 28 items divided into 14 subscales, each representing a specific coping strategy, such as active coping, planning, positive reframing, acceptance, humor, religion, emotional support, instrumental support, self-distraction, denial, venting, substance use, behavioural disengagement, and self-blame. Each subscale contains 2 items, and responses are rated on a 4-point Likert scale, ranging from 1 (“I haven’t been doing this at all”) to 4 (“I’ve been doing this a lot”). For example, items include: “I’ve been taking action to try to make the situation better”, “I’ve been trying to see things in a different light, to make them seem more positive”, “I’ve been getting emotional support from others”, “I’ve been refusing to believe that this has happened.” The Brief-COPE has demonstrated strong psychometric properties, with internal consistency (Cronbach’s alpha) ranging from .60 to .90 across subscales in various populations (Carver, 1997; Poczwardowski & Conroy, 2002). In this study, the overall internal consistency for the Brief- COPE was .89, indicating high reliability for the sample of chronic patients. This scale provides a comprehensive assessment of both adaptive and maladaptive coping strategies, making it suitable for examining the relationship between coping mechanisms and health behaviour.

3.4. Adherence to treatment

Adherence to treatment was measured using the Morisky Medication Adherence Scale (MMAS- 8), a validated and widely used tool for assessing medication adherence in chronic patients (Morisky *et al.*, 2008). The MMAS-8 consists of 8 items designed to evaluate the extent to which patients follow their prescribed medication regimens. The scale includes questions about forgetting to take medication, carelessness in taking medication, stopping medication when feeling better, and stopping medication when feeling worse, among others. Responses are scored on a binary scale (yes/no) for the first 7 items, with each "yes" response indicating non-adherence. The 8th item is rated on a 5-point Likert scale, ranging from 1 (“never”) to 5 (“always”), to capture the frequency of adherence-related behaviours. The total score ranges from 0 to 8, with higher scores indicating better adherence to treatment. For example: “Do you sometimes forget to take your medication?” (Yes/No), “Are you sometimes careless about taking your medication?” (Yes/No), “How often do you have difficulty remembering to take all your medications?” (1 = never, 5 = always). The MMAS-8 has demonstrated strong psychometric properties, with a Cronbach’s alpha of .83 in the original validation study (Morisky *et al.*, 2008). In this study, the internal consistency for the MMAS-8 was .87, indicating high reliability for the sample of chronic patients.

3.5. Procedure

The management of the University of Uyo Teaching Hospital, Akwa Ibom State, and the University of Port Harcourt Teaching Hospital granted permission for the research team to recruit participants for the study. When patients visiting the hospitals identified themselves as individuals managing chronic illnesses (COPD, diabetes, dyslipidemia, or hypertension) to the healthcare providers, the research assistants approached them, established rapport, and invited them to participate in the study. The research assistants explained the study’s objectives, emphasized the voluntary nature of participation, and outlined participants’ rights to informed consent and confidentiality. The average duration from initial contact to completion and return of the questionnaire form was 20–25 minutes. A total of 420 questionnaire forms were distributed equally between the two hospitals, with 210 forms allocated to the University of Uyo Teaching Hospital and 210 to the University of Port Harcourt Teaching Hospital. Out of these, 398 were completely filled and returned, while the remaining 22 were discarded due to incomplete or inconsistent responses. This yielded a high return rate of 94.8%. Specifically, at the University of Uyo Teaching Hospital, 200 out of 210 questionnaire forms were retrieved, resulting in a 95.2% return rate. At the University of Port Harcourt Teaching Hospital, 198 out of 210 questionnaire forms were retrieved, resulting in a 94.3% return rate.

3.6. Data analysis

After all the chronic patients had been completed the copies of questionnaire, the data were entered into a database and coded for subsequent statistical analysis using the SPSS software package (version 22.0 for Windows). After conducting the descriptive analyses, a series of correlation analyses and corresponding regression analyses were performed with the aim of assessing the potential mediating role of social support in self-efficacy and treatment adherence. The principles outlined by Baron and Kenny (1986) were taken as a reference framework for all relevant analyses. According to these authors, the central idea of a mediation model is that the effects of the independent variable on behaviour (dependent variable) are mediated by different transformation processes or variables. In general, a given variable can be said to function as a mediator to the extent that it represents the relationship between the predictor and the criterion.

4. Result

Table 1: Demographic Characteristics of the Sample (N = 398)

Variable	Category	Frequency	Percentage
Gender			
	Male	151	61.0
	Female	247	39.0
	Total	**398**	**100.0**
Age (Years)			
	21–40	45	28.0
	41–60	210	18.5
	61–65	143	18.5
	Total	**398**	**100.00**
	Mean (SD)	**54.71 (9.45)**	
Medical Condition			
	Hypertension	147	37.0%
	Dyslipidemia	123	31.0%
	Diabetes	80	20.0%
	COPD	48	12.0%
	Total	**398**	**100.00**

The demographic characteristics of the study sample (N = 398) are summarized in Table 1. The sample consisted of 62% females (n = 247) and 38% males (n = 151), indicating a higher representation of women in the study. Participants ranged in age from 21 to 65 years, with a mean age of 54.71 years (SD=9.45). The majority of participants (53%) fell within the 41–60 years age group, while 36% were aged 61–65 years, and 11% were between 21 and 40 years. This age distribution reflects a focus on middle-aged and older adults, which is consistent with the study's emphasis on chronic health conditions.

In terms of medical conditions, the most prevalent condition among participants was hypertension (37%, n = 147), followed by dyslipidemia (31%, n = 123), diabetes (20%, n = 80), and Chronic Obstructive Pulmonary Disease (COPD) (12%, n = 48). These conditions are commonly associated with chronic illness management and adherence to treatment, making the sample well-suited for examining the relationships between coping strategies, self-efficacy, and health behaviour. The demographic profile of the sample provides a robust foundation for analyzing the study's objectives and ensuring the generalizability of findings to similar populations of chronic patients.

Table 2: Correlations Between Demographic Variables and Study Variables (N = 398)

Variables		1	2	3	4	5
1	Age	-				
2	Gender	-.79**	-			
3	Coping Strategies	.22**	.06	-		
4	Self-efficacy	.45**	.30*	.48***	-	
5	Adherence to treatment	.58**	.19	.27***	.56**	-

Note. ***p < .001; **p < .01; p < .05

The correlation table (Table 2) presents the relationships between demographic variables (age and gender) and study variables (coping strategies, self-efficacy, and adherence to treatment) in a sample of 398 participants. The results reveal that age showed significant positive correlations with all study variables. Specifically, age was strongly correlated with self-efficacy ($r = .45$, $p < .01$) and adherence to treatment ($r = .58$, $p < .01$), indicating that older participants were more likely to report higher levels of self-efficacy and better adherence to treatment. Age also had a moderate positive correlation with coping strategies ($r = .22$, $p < .01$), suggesting that older individuals were more likely to use adaptive coping mechanisms.

In terms of gender, the results showed a significant negative correlation between gender and age ($r = -.79$, $p < .01$), indicating that women in the sample tended to be younger than men. Gender also had a significant positive correlation with self-efficacy ($r = .30$, $p < .05$), suggesting that women reported higher levels of self-efficacy compared to men. However, gender did not show significant correlations with coping strategies ($r = .06$, $p > .05$) or adherence to treatment ($r = .19$, $p > .05$), indicating that these variables were not strongly influenced by gender in this sample.

In addition, coping strategies were significantly correlated with both self-efficacy ($r = .48$, $p < .001$) and adherence to treatment ($r = .27$, $p < .001$). This indicates that individuals who employed adaptive coping strategies were more likely to have higher self-efficacy and better adherence to treatment. The strong correlation between coping strategies and self-efficacy suggests that effective coping mechanisms may enhance an individual's belief in their ability to manage their health, which in turn promotes adherence to treatment. Furthermore, self-efficacy had a strong positive correlation with adherence to treatment ($r = .56$, $p < .01$), revealing the critical role of self-belief in promoting health-related behaviors. This implies that individuals with higher self-efficacy were more likely to adhere to their treatment regimens, likely because they felt more capable of managing their health and overcoming challenges associated with their condition.

4.1. Mediational analysis

In line with the mediation framework presented by Baron and Kenny (1986), a series of regression analyses were conducted to determine whether coping strategies plays a mediating role between self-efficacy and treatment adherence in patients. For a mediator effect to be present, certain requirements must be met regarding the regression analysis: 1) The independent variable (self- efficacy) and the mediating variable (coping strategies) are actually related; 2) The mediating variable (coping strategies) has a unique and significant effect on the dependent variable (adherence); 3) The independent variable (self-efficacy) has an effect on the dependent variable (adherence) in the absence of the mediating variable (coping strategies); and 4) The inclusion of the mediating variable (coping strategies) to the model decreases the effect of the independent variable (self-efficacy) on the dependent variable (adherence). In this case, self-efficacy may disappear from the regression equation when including coping strategies in the analysis (which would mean that the effect of mediation would be clearer and more obvious) or self-efficacy may decrease its effect on adherence when including coping strategies in the regression (see Table 3).

Table 3: Mediational Analysis of the Effect of Coping Strategies on Self-Efficacy and Treatment Adherence

Path	B	SE	β	95% CI	p
Direct effect					
Coping Strategies → Self-Efficacy	0.47	0.08	.38	[0.36, 0.64]	<.001
Self-Efficacy → Adherence	0.58	0.09	.42	[0.36, 0.76]	<.001
Coping Strategies → Adherence	0.14	0.06	.11	[0.03, 0.23]	.03
Indirect effect					
Coping Strategies→Self-Efficacy→Adherence	0.28	0.03	.18	[0.18, 0.36]	<.001
Total Effects					
Coping Strategies → Adherence	0.40	0.07	.30	[0.28, 0.50]	<.001

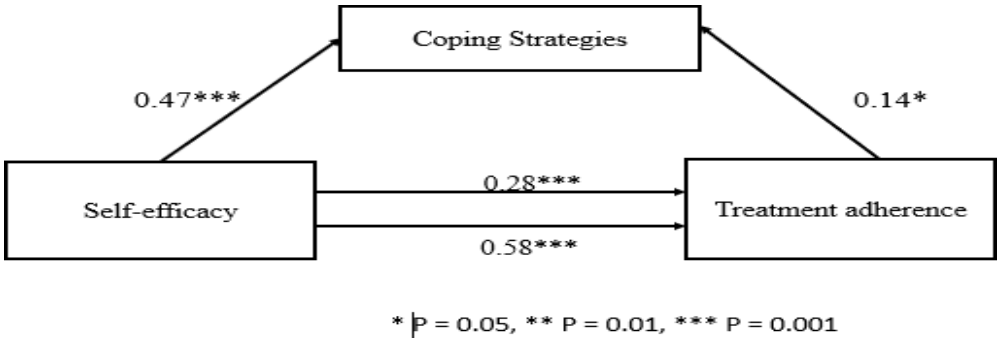
B = unstandardized regression coefficient; SE = standard error; β = standardized regression coefficient; CI = confidence interval. The indirect effect was tested using bootstrapping with 5,000 samples. The mediational analysis presented in Table 3 examines the role of self-efficacy in mediating the relationship between coping strategies and treatment adherence. The results reveal significant direct and indirect effects, providing insights into how coping strategies influence adherence both directly and through self-efficacy.

The direct effect of coping strategies on self-efficacy was significant ($B = 0.47$, $\beta = .38$, $p < .001$), indicating that individuals who used adaptive coping strategies were more likely to report higher levels of self-efficacy. This suggests that effective coping mechanisms, such as problem-solving or emotional regulation, enhance an individual's confidence in managing their health. In turn, self-efficacy had a significant direct effect on adherence to treatment ($B = 0.58$, $\beta = .42$, $p < .001$), meaning that individuals with higher self-efficacy were more likely to adhere to their treatment regimens. This finding shows the importance of self-belief in promoting health-related behaviours. Additionally, coping strategies had a small but significant direct effect on adherence ($B=0.14$, $\beta = .11$, $p = .03$), independent of self-efficacy, suggesting that adaptive coping strategies can improve adherence even when self-efficacy is not a factor.

The indirect effect of coping strategies on adherence through self-efficacy was also significant ($B= 0.28$, $\beta = .18$, $p < .001$), with a 95% confidence interval of [0.18, 0.36] that did not include zero. This indicates that coping strategies not only directly improve adherence but also enhance self-efficacy, which further promotes adherence. This mediation effect highlights the interconnectedness of psychological factors in shaping health behavior.

Finally, the total effect of coping strategies on adherence ($B = 0.40$, $\beta = .30$, $p < .001$) was significant, reflecting the combined impact of both direct and indirect pathways. This suggests that adaptive coping strategies have a substantial overall influence on treatment adherence, both by directly encouraging adherence and by boosting self-efficacy. This mediation result is shown on figure 2 below;

Figure 2: Mediation model illustrating the relationship between coping strategies, self- efficacy, and treatment adherence



5. Findings and discussion

The purpose of this study was to examine the mediating role of coping strategies in the relationship between self-efficacy and treatment adherence among chronic patients. The findings revealed significant direct and indirect effects, providing valuable insights into how coping strategies influence adherence both directly and through their impact on self-efficacy. These results contribute to a deeper understanding of the psychological mechanisms underlying health behaviour and highlight the importance of addressing coping strategies and self-efficacy in interventions aimed at improving treatment adherence.

The direct effect of coping strategies on self-efficacy was significant, indicating that individuals who employed adaptive coping strategies, such as problem-solving and emotional regulation, were more likely to report higher levels of self-efficacy. This finding aligns with previous research demonstrating that effective coping mechanisms enhance an individual's confidence in managing their health (Carver & Connor-Smith, 2010; Taylor & Stanton, 2007). For example, problem- focused coping strategies enable individuals to address health-related challenges proactively, while emotional regulation techniques help reduce stress and improve decision-making (Aldao et al., 2010). These adaptive coping strategies not only build self-efficacy but also empower individuals to take control of their health, leading to better adherence to treatment regimens.

Self-efficacy, in turn, had a significant direct effect on adherence to treatment, showing the critical role of self-belief in promoting health-related behaviours. Individuals with higher self-efficacy were more likely to adhere to their treatment plans, likely because they felt more capable of managing their health and overcoming challenges associated with their condition. This finding is consistent with Bandura's (1997) social cognitive theory, which posits that self-efficacy is a key determinant of health behaviour. Moreover, the study revealed that coping strategies had a small but significant direct effect on adherence, independent of self-efficacy. This suggests that adaptive coping strategies can improve adherence even in the absence of high self-efficacy, highlighting the multifaceted nature of coping mechanisms in shaping health behaviour.

The indirect effect of coping strategies on adherence through self-efficacy was also significant, with a 95% confidence interval that did not include zero. This indicates that self-efficacy partially mediates the relationship between coping strategies and adherence. In other words, coping strategies not only directly improve adherence but also enhance self-efficacy, which further promotes adherence. This mediation effect highlights the interconnectedness of psychological factors in shaping health behaviour and underscores the importance of addressing both coping strategies and self-efficacy in interventions aimed at improving treatment adherence.

Finally, the total effect of coping strategies on adherence was significant, reflecting the combined impact of both direct and indirect pathways. This suggests that adaptive coping strategies have a substantial overall influence on treatment adherence, both by directly encouraging adherence and by boosting self-efficacy.

These findings align with recent studies emphasizing the role of coping strategies and self-efficacy in health behaviour (Schwarzer & Fuchs, 1996; Schwarzer & Renner, 2000; Zhou et al., 2021; Hapunda, 2022; Rapelli et al., 2022). For example, Hapunda (2022) found that adaptive coping strategies were associated with better adherence to diabetes management, while Rapelli *et al.* (2022) demonstrated that self-efficacy mediated the relationship between coping strategies and adherence in patients with cardiovascular disease.

The findings of this study have important implications for clinical practice and intervention design. First, they highlight the need for interventions that promote adaptive coping strategies, such as problem-solving and emotional regulation, while addressing maladaptive strategies, such as avoidance and denial. Programs that teach patients how to cope effectively with the stress and challenges of chronic illness can enhance their ability to adhere to treatment regimens. Second, the results underscore the importance of building self-efficacy through skill-building and education. Interventions that empower patients to take control of their health and believe in their ability to manage their condition can lead to improved adherence and health outcomes.

The study also contributes to the broader literature on health behaviour by providing empirical support for the mediating role of coping strategies in the relationship between self-efficacy and treatment adherence. These findings align with previous research demonstrating the importance of psychological factors in health behaviour (Fernández et al., 2001; Martos-Méndez, 2015). However, the study extends this literature by highlighting the specific pathways through which coping strategies influence adherence, providing a more nuanced understanding of the mechanisms underlying health behaviour.

6. Implications of the findings

The findings of this study have significant implications for understanding the role of coping strategies and self-efficacy in treatment adherence among chronic patients. The mediation analysis revealed that coping strategies not only directly influence adherence but also enhance self-efficacy, which further promotes adherence. This dual pathway underscores the importance of addressing both psychological and behavioural factors in interventions aimed at improving health outcomes (Bandura, 1997; Carver & Connor-Smith, 2010).

One key implication is the need for interventions that promote adaptive coping strategies, such as problem-solving and emotional regulation, while addressing maladaptive strategies, such as avoidance and denial. Adaptive coping mechanisms empower individuals to manage the stress and challenges associated with chronic illness, leading to better adherence to treatment regimens (Lazarus & Folkman, 1984; Taylor & Stanton, 2007). For example, programs that teach patients how to cope effectively with their condition can enhance their ability to adhere to medication, diet, and exercise plans. This is particularly important for individuals with chronic illnesses, where long-term adherence is critical for managing symptoms and preventing complications.

The findings also highlight the importance of building self-efficacy in chronic patients. Self- efficacy, or an individual's belief in their ability to manage their health, was found to be a critical determinant of treatment adherence (Bandura, 1997). Interventions that focus on enhancing self- efficacy through skill-building, education, and positive reinforcement can empower patients to take control of their health and adhere to their treatment plans (Schwarzer & Warner, 2013). For instance, healthcare providers can use motivational interviewing techniques to help patients set realistic health goals and develop confidence in their ability to achieve them (Miller & Rollnick, 2012).

Another implication is the potential for integrating coping strategies and self-efficacy into existing treatment programs. For example, cognitive-behavioural therapy (CBT) could be adapted to include modules on

coping skills and self-efficacy, helping patients develop the psychological tools needed to manage their condition effectively (Hofmann et al., 2012). Similarly, support groups and peer-led interventions could provide a platform for patients to share coping strategies and build self-efficacy through social learning and mutual encouragement.

The study also has implications for healthcare policy and resource allocation. Given the significant role of coping strategies and self-efficacy in treatment adherence, policy makers should prioritize funding for programs that address these psychological factors (Fernández et al., 2001). This could include training healthcare providers to deliver evidence-based interventions, as well as developing public health campaigns to raise awareness about the importance of coping skills and self-efficacy in managing chronic illness.

Furthermore, the findings suggest that interventions should be tailored to the specific needs of different patient populations. For example, older adults, who reported higher levels of self-efficacy and adherence in this study, may benefit from programs that build on their existing coping skills and confidence (Kato, 2015). In contrast, younger adults, who may struggle with adherence due to lower self-efficacy, may require more intensive support to develop adaptive coping strategies and build confidence in managing their health (Southwick et al., 2014).

Finally, the study contributes to the broader literature on health behaviour by providing empirical support for the mediating role of coping strategies in the relationship between self-efficacy and treatment adherence. This adds to the growing body of evidence highlighting the importance of psychological factors in health behaviour and underscores the need for a holistic approach to healthcare that addresses both physical and psychological well-being (Taylor & Stanton, 2007; Aldao et al., 2010). In conclusion, the findings of this study have important implications for clinical practice, intervention design, and healthcare policy.

7. Contribution of the study

This study makes a significant contribution to the existing body of knowledge on chronic illness management by uncovering the mediating role of coping strategies in the relationship between self-efficacy and treatment adherence. While past research has extensively documented the positive influence of self-efficacy on adherence behavior, there has been limited exploration of the underlying mechanisms that explain how self-efficacy leads to better adherence. By demonstrating that coping strategies act as a bridge in this relationship, the study adds a detailed understanding of the psychological processes that support adherence to treatment regimens among chronic patients.

Additionally, the study advances knowledge by empirically validating that coping strategies not only exert a direct effect on treatment adherence but also enhance self-efficacy, which in turn promotes adherence. This dual influence shows the importance of fostering adaptive coping mechanisms in chronic illness management programs. Such insights are particularly valuable in the Nigerian healthcare context, where chronic disease prevalence is rising and long-term treatment adherence is a growing challenge. Therefore, the findings contribute context-specific evidence that can inform the design of psychosocial interventions aimed at improving health outcomes in resource-constrained settings.

Furthermore, the use of established measurement tools and the application of the Baron and Kenny (1986) mediation framework strengthens the methodological rigor of the study, offering a replicable model for future research in similar populations. In sum, this study enriches the theoretical and practical understanding of the interrelationship between self-efficacy, coping strategies, and treatment adherence, and provides a foundation for more integrated, psychologically informed approaches to chronic illness care.

8. Limitations and suggestions for further studies

The current study, while providing valuable insights into the mediating role of coping strategies in the relationship between self-efficacy and treatment adherence, has several limitations that should be acknowledged. First, the study was correlational in nature, which limits the ability to establish causality between the variables. Although the findings suggest significant associations, they do not confirm causal relationships. Future research should employ longitudinal or experimental designs to examine the temporal relationships between coping strategies, self-efficacy, and treatment adherence. This would provide stronger evidence for the causal pathways identified in this study.

Another limitation is the reliance on self-reported measures for all variables, which may have led to an overestimation of the strength of the relationships due to shared method variance. Self-reports are susceptible to biases, such as social desirability or recall bias, which could affect the accuracy of the data. To address this limitation, future studies could adopt a multi-method approach that combines self-reports with behavioural observations or objective measures of adherence, such as medication tracking devices or clinical records. This would provide a more comprehensive understanding of the relationships between the variables.

The study also focused exclusively on chronic patients, which limits the generalizability of the findings to other populations. Future research should explore these relationships in diverse populations, including individuals with acute conditions or those at different stages of illness. Additionally, the study did not collect detailed demographic information, such as socio-economic status, education level, or cultural background, which could influence coping strategies, self- efficacy, and adherence. Including these variables in future studies would allow for a more nuanced analysis and help identify potential moderators of the relationships observed.

Furthermore, the study did not account for prior trauma or adverse childhood experiences, which may influence coping strategies and self-efficacy. Research has shown that early trauma can shape an individual's coping mechanisms and psychological resilience (Hartman & Morse, 2020). Future studies should include measures of early trauma or adverse childhood experiences to better understand how these factors may interact with current coping strategies and self-efficacy to influence treatment adherence.

Finally, the study did not explore the role of other potential mediators or moderators, such as social support, personality traits, or health literacy, which could further explain the relationships between coping strategies, self-efficacy, and adherence. Future research should investigate these factors to provide a more comprehensive understanding of the mechanisms underlying treatment adherence.

For example, examining the role of social support as a mediator or moderator could shed light on how interpersonal relationships influence coping and self-efficacy in the context of chronic illness.

9. Conclusion

The study examined how coping strategy bridges the gap on the relationship between self-efficacy and adherence to treatment. The findings of this study demonstrate that coping strategies play a critical mediating role in the relationship between self-efficacy and treatment adherence among chronic patients. Specifically, adaptive coping strategies not only directly improve adherence but also enhance self-efficacy, which further promotes adherence. This dual pathway highlights the interconnectedness of psychological factors in shaping health behaviour and underscores the importance of addressing both coping mechanisms and self-efficacy in interventions aimed at improving health outcomes.

The study provides empirical evidence that adaptive coping strategies, such as problem-solving and emotional regulation, empower individuals to manage the stress and challenges associated with chronic illness, leading to better adherence to treatment regimens. At the same time, self- efficacy acts as a key mechanism through which coping strategies influence adherence, emphasizing the role of self-belief in promoting health-

related behaviours. These findings contribute to a deeper understanding of the psychological processes underlying treatment adherence and provide a foundation for developing targeted interventions.

Furthermore, the study highlights the need for holistic approaches to healthcare that address both psychological and social determinants of health behaviour. By promoting adaptive coping strategies and enhancing self-efficacy, healthcare providers can help chronic patients better manage their conditions and achieve improved adherence to treatment. Based on these findings, the following were recommended;

- Healthcare providers should incorporate coping strategies training into chronic illness management programs. Since the study found that coping strategies mediate the relationship between self-efficacy and treatment adherence, equipping patients with adaptive coping techniques (e.g., problem-solving, emotional regulation) can strengthen their ability to manage their condition and stay committed to treatment regimens.
- Interventions aimed at boosting patients' confidence in managing their illness such as structured health education, peer support groups, and goal-setting workshops should be prioritized. Given that self-efficacy significantly predicts adherence, empowering patients to believe in their capacity to follow through with treatment is critical.
- Given the Nigerian context of the study, healthcare systems should design psychosocial interventions that reflect local beliefs, values, and healthcare access realities. Tailoring support programs to the cultural and social context will likely enhance the effectiveness of efforts to improve both coping strategies and adherence among chronic patients.

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