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ORIGINAL RESEARCH

Moderating Effects of Authentic Happiness on the Relationship Between Health-seeking Behaviour and Treatment Adherence Among Patients with Hypertension

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Abstract

Background: Hypertension is a chronic health condition that requires consistent management and adherence to treatment. However, there is a dearth of empirical data on the psychological factors influencing treatment adherence among patients with hypertension in Nigeria.
Objectives: To determine the moderating effects of authentic happiness on the relationship between health-seeking behaviour and treatment adherence among patients with hypertension.
Methods: The study used a cross-sectional study design. Survey tools comprising items of the Authentic Happiness Scale, Health-seeking Behaviour Scale, Hill-bone Compliance High Blood Pressure Therapy Scale were used to obtain data from two hundred and ninety (290) patients who were selected by purposive sampling and met the study eligibility criteria.
Results: Increase in health-seeking behaviour and authentic happiness showed significant effects on adherence to treatment [$\beta_1 = 0.241$, $t = 2.92$, $p = 0.004$; $\beta_2 = 0.208$, $t = 4.80$, $p = 0.01$ respectively]. The interaction between health-seeking behaviour and authentic happiness lacked significant effects on treatment adherence [$\beta_3 = 0.003$, $t = 0.032$, $p = 0.751$]. The analysis of conditional effects revealed that the effects of health seeking behaviour on treatment adherence were significantly differentiated when happiness was low [$\beta = 0.263$, $t = 2.46$, $p = 0.015$], moderate [$\beta = 0.241$, $t = 2.92$, $p = 0.004$], or high [$\beta = 0.219$, $t = 2.02$, $p = 0.044$].
Conclusion: Health-seeking behaviour and authentic happiness are potential explanatory factors for adherence to treatment among patients with hypertension.

Keywords: Authentic Happiness, Health-seeking Behaviour, Hypertension, Treatment Adherence.

Introduction

Hypertension is a chronic health condition that requires consistent management and adherence to treatment. The failure of patients to adhere to treatment recommendations or regimen is one of the fundamental causes of poor treatment outcomes and complications in hypertensive

care. [1-4] Treatment adherence is a reflection of patient's acceptance of the need for treatment, following medical prescriptions and continuing with therapy offered by healthcare providers. [3, 4] In Nigeria, empirical data from a study showed 36.8% and 23.9% of low and moderate levels of adherence to treatment respectively, in a group of 114 patients with hypertension [2]

Many factors interactively contribute to patients' likelihood of treatment adherence [1, 4] and some studies have attempted to find these contributory factors in different chronic health conditions. The answers to the question of why patients do not adhere are inconclusive and complex. However, the intake of psychoactive substances like alcohol was reported to be associated with poor adherence to treatment among some patients with hypertension. [4] There is also a report that good mental health is a predictor of treatment adherence and completion among patients receiving treatment for chronic illnesses. [3] Sometimes, individuals with hypertension also have comorbidities such as diabetes mellitus, obesity, hyperlipidaemia among others illnesses [5] and, understandably, such comorbidities could take a toll on the patients' mental health which in turn could make it difficult for them to respond appropriately to treatment recommendations. [3, 5, 6]

Additionally, there is an empirical report suggesting insecure-dismissing attachment style (characterized by compulsive self-reliance, high desire for autonomy, low desire for collaboration, distrust in others) that mediated the contribution of depression to patients' non-adherence to treatment. [7] It has also been found that the amount of time spent on discussing treatment adherence and intolerance during medical consultation could play a role in patients' adherence to treatments. [3] From the foregoing, it is obvious that many factors interplay in shaping how people perceive, receive, and follow treatment recommendations, whether it is as medications or lifestyle adjustments.

Health-seeking behaviour has been described as any activity people engage in when they feel sick for the purpose of finding remedy. [7, 8] In other words, people seek cure when they feel some symptoms that suggest something is wrong in their health. However, many times, people with hypertension may be asymptomatic. The symptomatic qualification of an illness is essential because, when an illness does not show any symptom, an individual could be unaware of its presence and consequently may not seek any treatment. The presence of a symptom could serve as a trigger for the action of getting healing. Some of the general health-seeking behaviours identified in literature include the use of traditional herbal medicines, self-medication, visit to health facilities for treatment, and sometimes, some people simply do nothing. [9]

There is evidence that low level of happiness has a link to physical inactivity. [10] This, in turn, has implication for health-related quality of life as well as hypertension. [11] Additionally, the link between happiness and protection against becoming ill has been documented. [12] Even longevity has been linked to happiness. [13] Authentic happiness has been described as a "consistent, spiritual, stable, harmonious, and responsible mood". [14] Despite the link between happiness and health, [12] the means by which happiness contributes to responses to treatment has not been clearly shown. In the light of this, this study set out to investigate the role of happiness as a predictor of adherence to treatment. In addition, it is imperative to characterize the effect of health-seeking behaviour on adherence to treatment, specifically among patients receiving antihypertensive treatment. This study focused on patients with hypertension because of the high rate of poor adherence to treatment frequently documented among them. [3-5] This study investigated the moderating effects of authentic happiness on the relationship between health-seeking behaviour and

treatment adherence among patients with hypertension. The research hypothesis included (1) health seeking behaviour will significantly contribute to adherence to treatment, (2) happiness will significantly predict treatment adherence, and (3) the effect of health seeking behaviour on treatment adherence will be significantly differentiated by the levels of happiness among individuals receiving antihypertensive care as conceptualized in Figure 1. If these hypotheses are confirmed, the findings may serve as an explanation for one of the ways by which authentic happiness could contribute to the experience of optimal treatment outcome and health of patients in the long run.

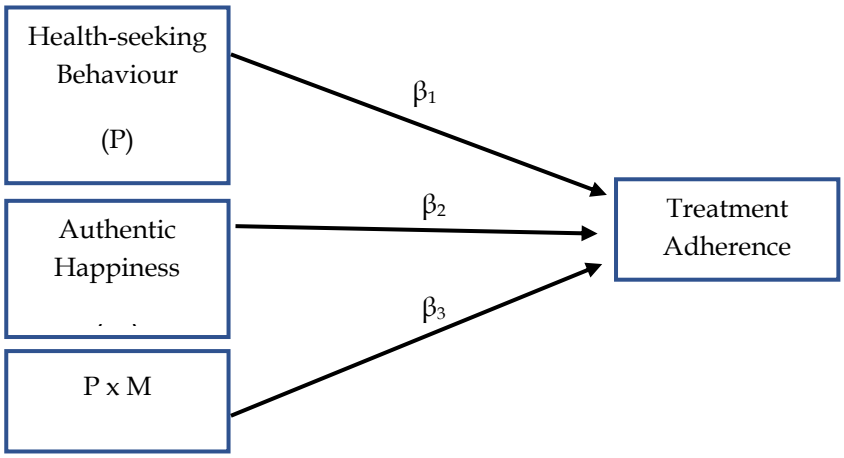

Figure 1: Authentic happiness (M) as a moderator for health-seeking behaviour (Predictor) and interaction (P x M) in treatment adherence while β represents estimated effects.

Methods

This study adopted a cross-sectional design using a survey method for data collection. The dependent variable was treatment adherence while health-seeking behaviour was a predictor and authentic happiness was a moderator. Age, religion, and education were controlled for as covariates.

Study Area

The study was conducted in four different hospitals namely: Apex Care Hospital, Ibadan, Oyo State Hospital, Oyo, West Wind Hospital and Maternity, Ibadan, and Opabode Memorial Hospital, Oyo, all in Oyo State, southwest Nigeria. These hospitals were selected because they had large numbers of patients receiving care for hypertension.

Study population

These included patients with the diagnosis of hypertension who had commenced antihypertensive treatment in the last six months. According to the estimates obtained from all the hospitals involved, a total of 1000 patients was taken as the estimated population size.

Inclusion criteria

These included (1) diagnosis of hypertension, and (2) use of antihypertensive medications in the preceding three months.

Sample size

This study involved 290 out-patients receiving antihypertensive treatment at the selected

hospitals. The sample size was determined using Slovin's formula: $N/1+N(e^2)$ with an estimated population size (N) of 1000 patients receiving antihypertensive treatment as obtained from all the selected hospitals and the level of significance (e) was set at 0.05. Based on this formula, the calculation: $1000/1+1000\ (0.05^2)$, yielded 285 sample size. For the purpose of non-response, the sample size was increased to 340 participants. Eventually, only 290 participants who successfully completed their questionnaires were included in the study.

Research instruments

A questionnaire comprising items derived from the Hill-bone Compliance High Blood Pressure Therapy Scale [15] for measuring treatment adherence was used. Participants' responses on the scale were rated on a 4-point Likert scale ranging from 1 = Not at all to 4 = Almost always. The internal consistency of the items showed Cronbach's alpha of 0.70. The sum of scores represented the participants' treatment adherence.

The questionnaire also contained the Authentic Happiness Scale. [14] It was a two-dimensional scale which measured authentic happiness and fluctuating happiness. Responses were rated on 5-point Likert scale ranging from 1 = Strongly disagree to 5 = Strongly agree. The total score represented the level of participants' authentic happiness. Internal consistency analysis showed Cronbach's alpha of 0.57 for the tool's reliability.

The researchers designed a health-seeking behaviour (HSB) scale in which participants identified how frequently they engaged in health-seeking behaviour by visiting the hospital for treatment when they experienced any of nine common symptoms: headaches, fever, cough/cold, abdominal upset, poor sleep or appetite, vomiting/diarrhoea, weakness/fatigue, pains, and fainting/dizziness. The responses were rated using a 3-point Likert scale (0 = Never, 2 = Occasionally, 3 = Always). First, the researchers did a factor analysis for the items in order to establish their construct validity. The Kaiser-Meyer-Olkin (KMO) for sampling adequacy and the Bartlett's Test of Sphericity for fitness of the data for factorization were statistically significant [KMO = 0.832; χ^2 (36) = 458.73, $p < 0.001$]. Next, the principal component analysis (PCA) extracted a single factor based on eigenvalues greater than 2 with all the items showing positive and moderate to high factor loadings on the singular factor extracted. This means the scale measured a single construct of health-seeking behaviour. Next, we analysed the internal consistency of all items and the result showed a good reliability with Cronbach's alpha of 0.76. Lastly, we obtained a composite score summing all the scores. Scores higher than the average of 8.56 (SD = 4.22) and scores lower than the average represented good and poor health-seeking behaviours respectively.

Procedure

The researchers administered 340 questionnaires out of which 290 were completed correctly. Others were excluded because they had missing data. The questionnaire was administered by the researcher in conjunction with the nurses at the study locations. The nurses were earlier trained on how to administer the instrument. Participants were also informed about how to respond to the questionnaires. Confidentiality was maintained during data collection and processing. Additionally, each participant returned his or her filled questionnaire to the researcher directly.

Data analyses

The data obtained were coded and summed in order to obtain composite scores for each participant on all the variables. The composite scores were analysed with linear regression. The researchers first tested the individual effects of health-seeking behaviour and happiness on treatment adherence as stated in the first and

second hypotheses. Then conditional effects of health-seeking behaviour on treatment adherence were tested based on different levels of authentic happiness as stated in the third hypothesis. Moderation analysis was done using the Hayes and Rockwood model [16-17] to obtain individual and conditional effects at 95% Confidence Interval ($p < 0.05$) while controlling for covariates. Due to significant mean differences of treatment adherence in age, religion, and education, these variables were included in the regression model as covariates in order to control for their contributions. All statistical analyses were performed with PROCESS v4.2 beta by Hayes in SPSS version 29. [17]

Ethical Consideration

The researchers obtained ethical approval for the conduct of this study from the Oyo State Hospitals' Management Board, State Hospital, Oyo, Oyo State, Nigeria. Permission was also obtained from the various hospitals selected for the study, in addition to the ethical clearance. A statement of informed consent was included in the research instrument. Participants had the freedom to withdraw or decline from participating in the study without consequence.

Results

The 290 participants comprised 160 (55.2%) males and 123 (42.4%) females but 7 (2.4%) did not indicate their gender. The mean age of the participants was 50±16.5 years. Table I shows that most of the participants (63.4%) were married, belonged to the Yoruba ethnic group (63.6%) or had tertiary education (65.5%) while 59.3% were business owners and 47.6% were employees with government or private organizations. Additionally, the average blood pressure was 145/93 mmHg and the average duration of hypertensive illness was 3 years.

Table II shows that 134 (46.2%) reported poor health-seeking behaviour with average treatment adherence score of 29.02±5.92 while 156 (53.8%) showed good health-seeking behaviour with average treatment adherence of 30.95±6.20.

Forty-one (14.1%) showed low happiness with average treatment adherence score of 25.32 (SD = 5.02), 213 (73.4%) had moderate happiness with average treatment adherence of 30.69±5.41 and 36 (12.4%) had high happiness with average adherence of 31.72±8.59. These show that treatment adherence was better when health-seeking behaviour was good and when happiness was moderate or high (Table III).

Table IV results show that increases in health-seeking behaviour showed significant effects on adherence to treatment [$\beta = 0.241$, $t = 2.92$, $p = 0.04$]. This confirmed the first hypothesis. Increases in authentic happiness also showed significant effects on adherence to treatment [$\beta = 0.208$, $t = 4.80$, $p = 0.01$] confirming the second hypothesis. However, the interaction between health-seeking behaviour and authentic happiness showed that the effects on treatment adherence at 95% confidence interval was not significant [$\beta = 0.003$, $t = 0.32$, $p = 0.751$]. Figure 2 shows the diagrammatic representation of the statistical effects.

Conditional effects analysis was performed to determine the conditional effects of health-seeking behaviour on treatment adherence based on the condition or levels of authentic happiness. Health-seeking behaviour showed significant effects on treatment adherence when authentic happiness was low [$\beta = 0.263$, $t = 2.46$, $p = 0.015$], moderate [$\beta = 0.241$, $t = 2.92$, $p = 0.004$] and high [$\beta = 0.217$, $t = 2.02$, $p = 0.044$]. This confirmed the third hypothesis. The results are shown in Table V.

Table I: Sociodemographic characteristics of participants

Characteristics	*Frequency (n = 290)*	*Percentage*
Gender		
Male	160	55.2
Female	123	42.4
Not indicated	7	2.4
Age		
Young adults (< 39 years)	73	25.2
Middle-aged adults (40 – 59 years)	128	44.1
Older adults (60+ years)	89	30.7
Marital Status		
Single	84	29.0
Married	184	63.4
Divorced/Separated	22	7.6
Education		
Primary	21	7.2
Secondary	97	33.4
Tertiary	172	59.3
No formal education	0	0.0
Ethnicity		
Yoruba	190	65.5
Igbo	55	19.0
Hausa	45	15.5
Others	0	0.0
Occupation		
Civil/Private Employee	124	42.8
Business Owner	138	47.6
Unemployed	28	9.7

Table II: Health-seeking behaviour, authentic happiness and treatment adherence

Variables	*Frequency (n = 290)*	*%*	*Treatment Adherence*	
			Mean	**SD**
Health-seeking Behaviour				
Poor	134	46.2	29.02	5.921
Good	156	53.8	30.95	6.204
Authentic Happiness				
Low	41	14.1	25.32	5.017
Moderate	213	73.4	30.69	5.407
High	36	12.4	31.72	8.594

Discussion

The adherence of patients receiving antihypertensive treatment is fundamental to optimal treatment outcome. The present study found that health-seeking behaviour and happiness are significant predictors of adherence to treatment. Previous studies showed that

adherence to treatment may not be a problem especially when significant challenges that could make it difficult for people to seek treatment, like separate clinic days for comorbid conditions, high costs of medications and transportation, and long waiting hours are removed. [19, 20] Unfortunately, these same challenges contribute to the experience of low happiness. Failure to adhere to treatment was associated with inappropriate health-seeking behaviours such as the use of alternative traditional medicines (herbs). [21] Patients who seek medication from autonomous sources have been reported to show greater likelihood of being non-adherent to treatment. [22] In the present study, better health-seeking behaviour predicts good adherence to treatment.

Table III: Factor loadings of health-seeking behaviour items using Principal Component Analysis (PCA)

Items	*Factor Loading*
How often do you visit the hospital when you experience the following symptoms?	
Headache	0.508
Fever	0.603
Cough or cold	0.549
Abdominal upset	0.613
Problem with sleep or appetite	0.552
Vomiting or diarrhoea	0.611
Weakness or fatigue	0.642
Pains	0.565
Fainting or dizziness	0.683

Kaiser-Meyer-Olkin = 0.832, Bartlett's (χ^2) (36) = 45873 < 0.01; Cronbach's alpha = 0.76.

Table IV: Moderating effects of authentic happiness on the relationship between health-seeking behaviour and treatment adherence

Variables	*β*	*SE*	*t*	*p*	*R*	*F*	*p*
Health seeking behaviour (P)	0.241	0.083	2.92	< 0.01	0.337	12.25	< 0.01
Authentic happiness (M)	0.208	0.043	4.80	< 0.01			
P x M	0.003	0.008	0.32	> 0.05			
Religion (C)	1.205	0.523	2.31	< 0.05			
Age (C)	0.690	0.464	1.487	> 0.05			
Educational level (C)	0.993	0.558	1.780	> 0.05			

P - Predictor, M - Moderator, x - interaction term, C – Covariate, β - Estimated effects, SE - Standard error, t - t-ratio, R - Multiple correlation coefficient, F - F-test.

There is a dearth of literature on the link between happiness and patients' treatment adherence. A community-based study showed that non-adherence to health recommendations such as physical activity had a link to lower level of happiness, [23] an association which the present study equally showed. Patients who reported higher levels of happiness also showed greater level of adherence to treatment regimen. [24] The present study suggests that both health-seeking behaviour and authentic happiness are significant predictors of adherence to treatment. The level of happiness could differentiate health-seeking behaviour in relation to adherence to treatment. This finding is consistent with empirical data from a previous study where

participants with moderate to high levels of happiness showed better medication adherence than low level of happiness. [25] Additionally, authentic happiness could contribute to better treatment outcome experience by enhancing good health-seeking behaviours among patients with chronic illnesses.

The findings in the present study revealed a significant relationship between health-seeking behaviour and adherence to treatment in agreement with the findings in a study carried out by Sheri and Jameson on primary care patients. [26] The latter reported that higher happiness levels were associated with better adherence to treatment. The evidence indicates that non-pathological emotional states such as happiness can result in psychological well-being, thereby exerting a profound effect on the incidence of health-seeking behaviours. Therefore, long term interventions for strengthening happiness, including the empowerment of interpersonal relationships, improvement of relationships between patients and their family members and establishment of appropriate relationships between patients and society, need to be implemented among patients with chronic diseases in order to optimize the effect of happiness on adherence to treatment. [27]

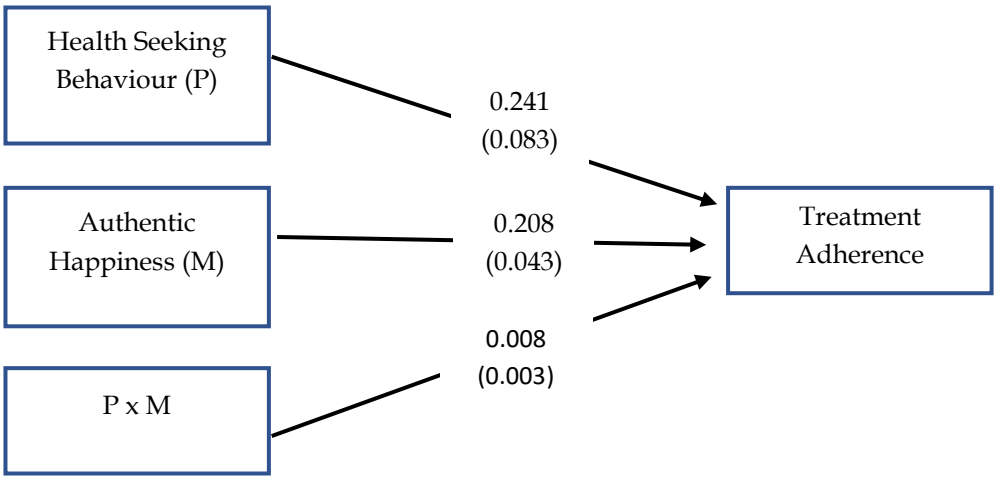

Figure 2: Conceptual diagram with estimated statistical effects and Standard errors (in parentheses).

Table V: Conditional effects of health-seeking behaviour on treatment adherence based on the levels of authentic happiness

Authentic Happiness	*β*	*SE*	*t*	*P*	*LLCI*	*ULCI*
Low (Mean - 1SD)	0.263	0.107	2.458	0.015	0.052	0.474
Moderate (Mean)	0.241	0.083	2.917	0.004	0.078	0.404
High (Mean + 1SD)	0.219	0.109	2.019	0.044	0.005	0.433

LLCI - Lower limit Confidence Interval; ULCI - Upper limit Confidence Interval

Conclusion

This study concludes that health-seeking behaviour and authentic happiness are potential contributory factors to adherence to treatment among patients with hypertension. Additionally, the levels of authentic happiness could differentiate patients' health-seeking behaviour in relation to adherence to treatment. Better treatment adherence appears to be associated with good health-seeking behaviour and increase in happiness levels. These findings have implications for a multidisciplinary approach to primary health care in terms of involvement of psychological interventions that could address patients' emotional and behavioural responses to treatment of physical illnesses.

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