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Original Research

Psychometric qualities of the 9-item patient-doctor relationship questionnaire in stable Nigerian patients with schizophrenia

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ABSTRACT

Background: The patient-doctor relationship concept has not been investigated among Nigerian patients with schizophrenia. The aim of this study was to explore the psychometric qualities of the 9-item Patient-Doctor Relationship Questionnaire (PDRQ-9) in a sample of outpatients receiving treatment for schizophrenia in South-western Nigeria. **Methods:** The PDRQ-9 in addition to other measures was completed by 309 consecutively recruited outpatients receiving treatment for schizophrenia between October 2014 and March 2015. Exploratory and Confirmatory Factor Analyses were used to examine the factorial structure while the reliability and validity were examined using correlational analyses. **Results:** Exploratory factor analysis confirmed the one-dimensionality of the factor structure of the PDRQ-9. The one factor model of the PDRQ-9 had satisfactory goodness of fit (GFI) indices on Confirmatory Factor Analysis (CMIN/DF = 1.72; $P = 0.030$; GFI = 0.98; adjusted GFI = 0.95; comparative fit index = 0.99; Tucker-Lewis index = 0.98; standardized root mean square residual = 0.021; expected cross-validation index = 0.276; root mean square error of approximation = 0.048). Internal consistency of the scale was satisfactory (Cronbach's alpha = 0.92). Test-retest reliability was also satisfactory (Intra-class correlation coefficient of 0.738, 95% confidence interval = 0.654-0.802, $r_p = 0.74$, $P < 0.001$). Construct validity was supported by modest positive correlations with the Trust in physician scale ($r_p = 0.413$, $P < 0.001$), duration of treatment ($r_p = 0.114$, $P = 0.044$), number of previous hospitalizations ($r_p = 0.179$, $P = 0.002$), and negative correlation with the Morisky Adherence Scale ($r_p = 0.174$, $P = 0.002$). **Conclusion:** The scale appears useful in the evaluation of the relationship between Nigerian patients with schizophrenia and their psychiatrists. More studies are needed to further explore the properties of this scale among other Nigerian patient population in order to identify other variables that are influencing the patient-doctor relationship.

KEY WORDS: Factor structure, Nigeria, patient-doctor relationship, reliability, schizophrenia, validity

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INTRODUCTION

The efficacy and outcome of medical treatments depend to a significant extent on the nature of the relationship between physicians and their patients [1]. The concept of the patient-doctor relationship has been recognized to be highly integral to healthcare delivery [2]. Studies involving psychiatric and non-psychiatric patients' population have reported that satisfactory patient-physician interaction has been associated with a greater level of patient satisfaction, improved adherence to treatment, and a better treatment outcome [3-8]. The most relevant component of good psychiatric care for patients with mental disorders is the therapeutic relationship between the patients and their healthcare providers [9]. All the previous studies in Nigeria that had explored the interaction between patients and their healthcare providers were focused predominantly on assessing patients' satisfaction with health care services and not on the quality of the patient-physician relationship [10-13]. Eveleigh *et al.* [1] in a relatively recent systematic review identified 19 scales based on different theoretical models that have been developed to specifically examine and quantify the patient-doctor relationship based on the factors that have been recognized as vital to the sustenance of a productive interaction between the patient and the physician such as; trust [14], communication [15], and satisfaction with health care services [16]. They insinuated that of all the scales, the 9-item patient-doctor relationship questionnaire (PDRQ-9), on account of its brevity and excellent psychometric characteristics is very useful in the assessment of the patient-doctor relationship. The PDRQ-9 is a short scale that was developed to evaluate the patient-doctor relationship in the context of the primary care setting, from the patient's perspective. The initial psychometric characteristics of the PDRQ-9 in terms of its factorial structure, reliability, and validity were explored in a sample of patients selected from a neurological clinic for epilepsy (55 patients) and

general practice (110 patients). The authors reported that the items of the scale demonstrated satisfactory internal consistency (Cronbach's α of 0.94), satisfactory test-retest reliability, and validity [17], but they suggested that additional studies involving other patient populations will be needed to ascertain their findings. Therefore, the aim of this study was to explore the psychometric characteristics of the PDRQ-9, since no study using a reliable and valid scale had previously assessed the patient-doctor relationship from the perspective of Nigerian patients receiving treatment for chronic mental disorders. The identification of the factors that influence the relationship between Nigerian patients with schizophrenia and their psychiatrists may facilitate the recognition of the variables that may be modified as to positively impact on patients' overall wellbeing and functioning. We hypothesized that the construct validity of the PDRQ-9 will be supported by significant correlations with scales measuring trust in the physician, healthcare service satisfaction, medication adherence, and other variables such as duration of treatment and previous number of hospitalizations. In addition, we also hypothesized that the PDRQ-9 will exhibit a single dimension similar to the original scale on factor analysis.

METHODS

Subjects

This study was descriptive cross-sectional and the participants were outpatients receiving treatment for schizophrenia in the psychiatric clinics of 2 tertiary health care facilities in Southwestern Nigeria (Obafemi Awolowo University Teaching Hospital, Ile-Ife, Osun State and Ladoke Akintola University Teaching Hospital, Ogbomosho, Oyo State). The psychiatric outpatients' clinics hold twice a week in each center. Individuals diagnosed with schizophrenia aged 18 and above were consecutively recruited over 6 months (October 2014 to March 2015). A total of 309 outpatients on treatment for schizophrenia were recruited from both centers during this period. To eliminate the distorting effect that acute psychotic symptoms can have on the patient-doctor interaction, we only recruited patients who were clinically stable. Eligibility criteria for inclusion were; a minimum of elementary education, absence of comorbid chronic medical illnesses, and organic disorders, in addition, the patient must have been receiving treatment for schizophrenia under the care of a specific consultant psychiatrist for at least 6 months. In both centers, the diagnosis of schizophrenia was made according to the guidelines of the International Classification and Diagnostic Criteria for Diseases and Disorders, 10th version [18]. Individuals who refused to give consent were excluded from the study. The approval for the study was granted by the Ethical and Research Committees of each of the centers.

Measures

Sociodemographic and Illness-related questionnaire

This enquired about each outpatient's gender, age, marital status, the number of years of education, average monthly income if employed (in Naira), and previous number of schizophrenic relapses, number of previous hospitalizations on account of the illness, duration of receiving treatment under a specific consultant (in months), and the age of onset of illness.

PDRQ-9

This scale is composed of 9 statements requesting the patient to make a subjective assessment of his or her perception of the relationship with the primary care physician (in the context of this study, the psychiatrist), thus it serves as a brief measure to quantify the therapeutic dimensions of the patient-doctor relationship. Each item of the scale is scored according to a 5-point Likert method; 1 = "not at all appropriate," 2 = "somewhat appropriate," 3 = "appropriate," 4 = "mostly appropriate," 5 = "totally appropriate." The possible score can range from the minimum of 9 to a maximum of 45, with higher scores indicating a more favorable patient's perception of the patient-doctor relationship. The outpatients completed the PDRQ-9 without the presence of the consultant psychiatrist under which they were registered for treatment. This approach was adopted in order to encourage the outpatients to provide an honest opinion of their relationship with their psychiatrist.

Morisky adherence scale

This is a self-administered 8-item scale that identifies the various ways through which patients may fail to properly take their medications, such as reducing their medication dosage and not remembering to have their medications with them when traveling [19]. Higher scores on the scale are indicative of poorer medication adherence. This scale has been previously employed in measuring adherence among psychiatric outpatients in Nigeria [20].

Trust in physician scale

The trust in physician scale is a brief interviewer administered questionnaire that was developed to measure the level of trust that patients have in their health care providers [21]. It consists of 11 items assessed on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The score on the scale ranges from 11 to 55 with higher scores reflecting greater levels of trust in the physician responsible for their healthcare. The factor structure, reliability, and validity were recently described among Nigerian outpatients with psychiatric disorders [22].

Charleston psychiatric outpatient satisfaction scale (CPOSS)

This is a self-administered scale that evaluates patients' level of satisfaction with the quality of medical care they are receiving on an outpatient basis [23]. The aggregate score ranges from 13 to 65, and lesser scores are associated with lower levels of outpatient treatment satisfaction. The scale has been demonstrated to exhibit satisfactory reliability and validity among Nigerian psychiatric outpatients [12].

Patient health questionnaire-9 (PHQ-9)

This is a brief 9-item instrument for the screening and evaluation of the severity of depressive symptomatology [24].

The adequacy of psychometric qualities has been described to be satisfactory in the Nigerian clinical and nonclinical population [25-27].

Positive and negative symptom scale

This interviewer administered structured scale evaluates the severity of psychopathological symptoms among the study participants. It consists of 30 items assessing positive symptoms (7 items), negative symptoms (7 items), and general symptoms (16 symptoms) of psychosis, with each item measured on a 6 point (1-7) Likert scale [28].

Statistical Analysis

Data analysis was performed with the 21st version of the Statistical Products and Service Solutions (SPSS) for Windows. The reliability of the scale was examined by calculating the internal consistency and the test-retest coefficients with the Cronbach's alpha and intraclass correlation coefficients (ICC), respectively. Due to the normality of data distribution, parametric tests were used for correlational analyses. The construct validity of the PQRQ-9 was explored applying Pearson's correlational analyses with the trust in physician scale score, the Morisky adherence scale score, the CPOSS Score, the PHQ-9 score, number of previous relapses, number of previous hospitalizations due to the illness, and the duration of treatment. We performed an exploratory factor analysis (EFA) using principal component analysis (PCA) with Varimax rotation applying Kaiser's criteria of retaining the factors with Eigenvalues >1 [29]. The adequacy of data for EFA was examined using the Kaiser-Meyer-Olkin measurement of sampling adequacy [30]. Confirmatory factor analysis (CFA) with SPSS analysis of Moment Structure (AMOS) software, 20th version, was used to validate the factor model extracted with EFA by examining several Goodness of Fit indices (GFI) in which the acceptable model fit based on the Hu and Bentler criteria [31] is indicated by GFI, adjusted GIF (AGFI), Tucker-Lewis index (TLI) and Comparative fit index (CFI) values of 0.95 or greater, root mean square error of approximation (RMSEA) and standardized root mean square residual (SRMR) <0.05, and minimal expected cross-validation index (ECVI). Finally, a linear regression model with 95% Confidence Interval was used to determine the extent to which certain variables significantly determine the PDRQ-9 scores. All tests were two-tailed, and the level of statistical significance was set at $P < 0.05$.

RESULTS

Sociodemographic and Illness-Related Data ($n = 309$).

Table 1 shows the sociodemographic and illness-related data of the outpatients. Females accounted for 52.4% of the participants. The mean age was 40.12 (standard deviation [SD] 12.39). Majority (45.0%) were single, and the mean score on the PDRQ-9 was 32.40 (SD 7.09) with a range of 18-45.

Descriptive and Psychometric Characteristics of the PDRQ-9

As depicted in Table 2, the corrected item-scale correlations ranged from 0.61 to 0.80. The scales' items demonstrated satisfactory overall internal consistency (Cronbach's alpha = 0.92), and the removal of any of the items will not significantly increase the Cronbach's alpha. Only 6.1% of our outpatients had the maximum score of 45, and none obtained the lowest possible score of 9, indicating that ceiling and floor effects were not a problem. Optimal floor and ceiling effects has been described to range between 1% and 15% [32].

Table 1: Sociodemographic and illness-related data (n=309)

Variable	Mean (SD)/frequency (%)/range
Sex	
Male	147 (47.6)
Female	162 (52.4)
Age (years)	40.12 (12.39)/[18-83]
Marital status	
Single	139 (45.0)
Married	123 (39.8)
Separated/divorced	31 (10.0)
Widower	16 (5.2)
No of years of education	11.81 (4.49)/[5-26]
Average monthly income (in Naira)[a]	34,537 (39,113.41)/ [1000-156000]
PANSS positive	13.02 (2.91)/[7-16]
PANSS negative	7.06 (0.33)/[7-10]
PANSS general	16.50 (0.64)/[16-28]
No of schizophrenic relapses	2.58 (1.97)/[0-10]
No of previous admissions	0.63 (1.17)/[0-8]
Duration of receiving treatment (in months)	85.24 (87.12)/[6-408]
Age at illness onset (years)	29.92 (11.63)/[16-79]
Morisky adherence scale score	1.89 (2.14)/[0-8]
Trust in physician scale score	43.42 (5.54)/[26-55]
CPOSS score	46.83 (5.41)/[30-58]
PHQ-9 score	3.34 (4.97)/[0-27]
PDRQ-9 score	32.40 (7.09)/[18-45]

[a]160 (35.8%) of the patients who are currently employed, PDRQ-9: Patient-doctor relationship questionnare-9, PHQ-9: Patient health questionnaire-9, CPOSS: Charleston psychiatric outpatient satisfaction scale, PANSS: Positive and negative syndrome scale, SD: Standard deviation

Table 2: Descriptive and psychometric characteristics of the PDRQ-9

Item	Mean (SD)	Item-scale correlations	Cronbach's alpha if deleted
My PCP helps me	3.80 (1.05)	0.70	0.91
My PCP has enough time for me	3.70 (1.01)	0.75	0.91
I trust my PCP	3.65 (1.02)	0.75	0.91
My PCP understands me	3.73 (0.97)	0.79	0.91
My PCP is dedicated to help me	3.64 (0.98)	0.80	0.91
My PCP and I agree on the nature of my medical symptoms	3.44 (1.06)	0.72	0.91
I can talk to my PCP	3.47 (0.98)	0.64	0.92
I feel content with my PCP's treatment	3.58 (0.89)	0.79	0.91
I find my PCP easily accessible	3.39 (1.02)	0.61	0.92

PCP: Primary care physician, Cronbach's alpha: 0.92, SD: Standard deviation, PDRQ-9: Patient-doctor relationship questionnare-9

Test-retest Reliability of the PDRQ-9

The ICC between the total score on the PDRQ-9 completed initially by 309 outpatients and the total score on the scale completed after an interval of 2 weeks by 150 respondents was 0.738 (95% confidence interval = 0.654-0.802). The Pearson's correlation coefficient was 0.74 ($P < 0.001$), indicating modest adequacy of test-retest reliability [Table 3].

Exploratory and Confirmatory Factor Analysis

PCA showed that the 9 items of the scale loaded on a single factor (Eigen value 5.7) which accounted for approximately 63% of the total variance [Table 4]. As depicted in Figure 1, confirmatory factor analysis revealed that the single factor PDRQ-9 after model modifications with some error residual co-variations had satisfactory goodness of fit indices (CMIN/DF = 1.72; $P = 0.030$; GFI = 0.98; AGFI = 0.95; CFI = 0.99; TLI = 0.98; SRMR = 0.021; ECVI = 0.276; RMSEA = 0.048).

Construct Validity (Correlational Analyses) of the PDRQ-9

Table 5 shows that there were modestly significant positive correlations with the trust in physician scale score (r_p=0.413, $P < 0.001$), duration of treatment ($r_p = 0.114$, $P = 0.044$), and number of previous hospitalizations ($r_p = 0.179$, $P = 0.002$), while modest negative correlations was observed with the Morisky adherence scale score ($r_p = -0.174$, $P = 0.014$).

Table 3: Correlation of the test-retest reliability analysis for the PDRQ-9

Variable	Test	Re-test
N	309	150
Mean (SD)	32.40 (7.04)	32.37 (6.95)
Cronbach's alpha	0.92	0.85
Pearson's correlations (r_p)		0.74**

ICC: 0.738 (95% CI=0.654-0.802), **$P<0.001$, ICC: Intraclass correlation coefficient, CI: Confidence interval, SD: Standard deviation, PDRQ-9: Patient-doctor relationship questionnare-9

Table 4: EFA (principal component analysis with Varimax rotation)

Item	Factor loading
5. My PCP is dedicated to help me	0.858
8. I feel content with my PCP's treatment	0.855
4. My PCP understands me	0.849
3. I trust my PCP	0.817
2. My PCP has enough time for me	0.814
6. My PCP and I agree on the nature of MY Medical symptoms	0.772
1. My PCP helps me	0.771
7. I can talk to my PCP	0.705
9. I find my PCP easily accessible	0.679
Eigen value	5.7
Percentage of total variance explained	62.9%

Kaiser-Meyer-Olkin measure of sampling adequacy 0.891, Bartlett's test of Sphericity χ^2=1988 $P<0.001$, EFA: Exploratory factor analysis, PCP: Primary care physician

Multiple Linear Regression Data

The linear combination of the trust in physician scale score and the number of previous hospitalizations accounted for 19.0% of the variance in the PDRQ-9 scores [Table 6].

DISCUSSION

We explored the construct validity; reliability; and factorial structure of the PDRQ-9 in a representative cross-sectional sample of Nigerian outpatients receiving treatment for schizophrenia in tertiary health facilities in South-western Nigeria. We focused on patients receiving treatment for a chronic mental disorder in general hospital settings since no study in Nigeria had previously attempted to examine psychiatric patients' perception of their relationship with their health care providers. We did not experience extensive ceiling or floor effects, on the scale, suggesting that our outpatients appear to have provided an honest opinion of their relationship with their psychiatrists. This is in contrast to what was reported by the authors that examined the psychometric properties of the PDRQ-9 in a representative sample of the general population in Germany [2], and medical patients in Spain [33]. The mean score we obtained is similar to what was reported by the original developers of the scale [17]. Patients with schizophrenia who have a more favorable perception of their relationship with their physicians were statistically more likely to have a better treatment outcome reflected in terms of reduction in symptom severity, reduced rehospitalization rates, improved social functioning, and better quality of life [34]. The PDRQ-9 among our outpatients had an overall internal consistency (Cronbach's alpha) of 0.92, a correlation coefficient comparable to what was reported by authors in Germany (Cronbach's alpha 0.95) [2], Spain (Cronbach's alpha 0.92) [35], the original

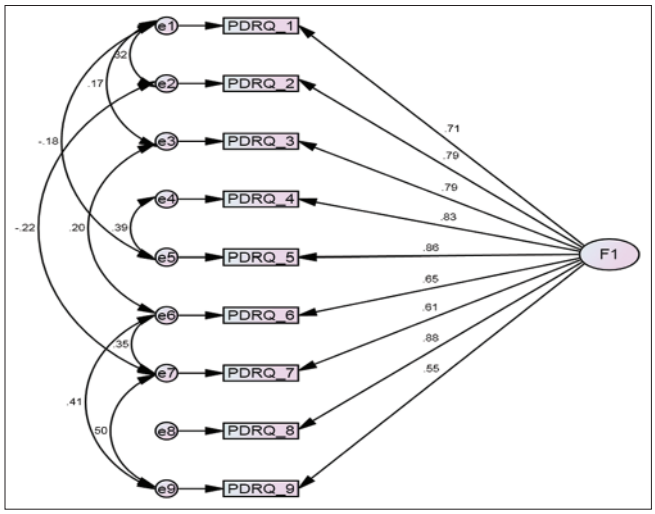

Figure 1: Path diagram with confirmatory factor analysis showing the item loadings for the 1-factor model of the PDRQ-9. Total sample: n = 309; Goodness-of-Fit indices: c^2 = 30.9; df = 18; p=0.030; CMIN/DF = 1.72; CFI = 0.99; goodness of fit = 0.98; adjusted goodness of fit = 0.95; Tucker-Lewis index = 0.99; standardized root mean square residual = 0.021; expected cross validation index = 0.276; root mean square error of approximation = 0.048

Table 5: Construct validity (correlational analyses) of the PDRQ-9

Variable	1	2	3	4	5	6	7	8
1. PDRQ9-Y	1							
2. TPS	0.413**	1						
3. PHQ-9	−0.021	−0.092	1					
4. adherence Score	−0.174**	−0.307**	0.315**	1				
5. No of previous relapses	0.100	−0.143*	0.001	0.140*	1			
6. Duration of treatment	0.114*	0.043	−0.019	−0.069	0.207**	1		
7. No of previous admissions	0.179**	0.061	0.032	−0.169**	0.218**	0.347**	1	
8. Satisfaction scale score	0.003	0.065	−0.100	0.012	−0.010	0.156**	0.012	1

*<0.05, **<0.001, PDRQ-9: Patient-doctor relationship questionnare-9, PHQ-9: Patient health questionnaire-9

Table 6: Multiple linear regression data

Variable	Unstandardized coefficient		Standardized coefficient			95% confidence interval
	B	SE	B	*t*	*P*	
Constant	9.240	3.196	-	2.891	0.004	2.951-15.528
TPS	0.513	0.069	0.401	7.402	<0.001	0.376-0.649
Adherence score	−0.081	0.181	−0.025	−0.451	0.653	−0.437-0.274
Treatment duration	0.007	0.005	0.080	1.445	0.149	−0.002-0.016
No of previous admissions	0.760	0.343	0.123	2.215	0.028	0.085-1.435

SE: Standard error, R^2=0.200, adjusted R^2=0.190

version (Cronbach's alpha 0.94) [17], Saudi Arabia (Cronbach's alpha 0.92) [36], and Turkey (Cronbach's alpha 0.91) [37]. Thus, we can postulate that the scale coherently evaluate different but related relationship facets that are pertinent to the interaction between our outpatients and their psychiatrists. In addition, the scale exhibited test-retest reliability similar to what was reported by the original developers of the scale [17].

To an extent, we were able to confirm our hypotheses concerning the construct validity of the PDRQ-9. We observed a statistically significant moderate positive correlation between the PDRQ-9 and the trust in physician scale, indicating that the better the patient-doctor relationship from the perspective of our outpatients, the higher the level of trust in their psychiatrists. Additional correlates that we observed in our study that further lend credence to the construct validity of the scale were the significantly modest positive correlation with the duration of treatment under a specific psychiatrist and the number of previous hospitalizations due to the illness. Previous studies have reported positive correlations between the duration of treatment and the quality of the patient-doctor relationship [38]. We postulated that the increased number of previous hospitalizations among our outpatients resulted in increased contact with their psychiatrists, which may contribute to a better patients' perception of the patient-doctor relationship. Furthermore, the positive correlation, though modest, between the PDRQ-9 and the duration of treatment under the supervision of a specific consultant psychiatrist could be a reflection of the concept of continuity in health care [39], which entails receiving health care in a specific place, and having a regular physician attending to the patients most of the time [40,41]. That a better patient-doctor relationship from the patient's perspective translates into better adherence to treatment has been previously reported in several studies involving psychiatric and non-psychiatric patient populations in developed countries [6,7,42]. Further studies are needed to recognize other factors that may explain the variability in the perception of their relationship with their physicians among Nigerian patients with psychiatric and non-psychiatric disorders.

We were also able to confirm our hypothesis regarding the factorial structure of the PDRQ-9 among Nigerian patients with schizophrenia. EFA supported by CFA yielded a one-dimensional structure similar to what was reported by the original developers of the scale [17]. The strength of our study lies in the fact that this is the first study to examine the psychometric properties of the PDRQ-9 among Nigerian patients with schizophrenia and the factors that influence the perception of their relationship with their psychiatrists. In addition, scales or instruments that evaluate patient-doctor interactions have been recognized as health outcome measures [43]. One limitation of our study is that we recruited patients only from general health care facilities in South-western Nigeria. Thus, there is the need for caution in generalizing our findings to psychiatric patients in other parts of the country. In conclusion, despite the limitation and the fact that the original scale was developed for use in primary care, the PDRQ-9 has proven to be a valid and reliable assessment of the patient-doctor relationship among Nigerian psychiatric outpatients on treatment for schizophrenia. We have generated some baseline information regarding the perception of the patient-doctor relationship among Nigerian patients with schizophrenia; we believe that other health care researchers in other specialties will be inspired to further explore the properties of this scale among the non-psychiatric patient population in Nigeria and Sub-Saharan Africa.

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