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Validation of the Self-Efficacy for Managing Chronic Disease Scale in Nigeria: Impact on Patients' Cognitive Capacity

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***Abstract*:** Self-management programmes targeted at enhanced self-efficacy are progressively being emphasized as a cost-effective way of alleviating patients' chronic illnesses. However, no measure of self-efficacy has been validated for chronic disease patients with varied cognitive failures. Chronic disease patients with complete data on cognitive failures and the SEMCD at their assessment between March and April 2016 in the southwest of Nigeria were used. Confirmatory factor analysis (CFA) was employed to assess the factor structure of the SEMCD scale. Reliability and parameter estimates of the scale were established using traditional Cronbach's alpha and item response theory (IRT) analyses. A total of 1214 patients were included. CFA supported the single factor structure of the SEMCD scale (Fit index= 1.00, comparative fit index = 1.00, root mean square error of approximation = 0.00). Internal consistency was high (α=0.94). A unidimensional graded response model also supported a single scale scoring process for the survey and showed all items as worthy contributors to the measuring scale. Significant negative relationships of the scale with cognitive failures ($r = -0.10$, $p<0.01$) and for the construct validity, with measures of health status ($r = -0.26$ - -0.10; $p<0.01$) and health care utilization ($r = -0.24$ ─ -0.12; $p<0.001$) were found. Scores from the SEMCD scale are valid for measuring self-efficacy in chronic disease patients with varied cognitive failures. Results support the scale as an outcome measure to evaluate the effectiveness of self-management programmes in patients with diverse cognitive capacities.

Keywords: Self-efficacy, Cognitive capacity, Chronic diseases, Nigeria, Validation.

1.0 Introduction

Health services, particularly those involving mental and chronic health impairment services, are often not provided at a level of quality that meets human rights standards. Thus, self-management programmes geared towards enhanced self-efficacy are increasingly being emphasized as a cost-effective way of improving patients' mental and chronic illnesses [1]. Such programmes enable people with chronic diseases to adapt to a complex set of behaviours that promote self-management and prevent complications associated with the diseases [2]. The programmes involve a combination of skills, attitudes, abilities and other strategies required to cope with chronic diseases through enhancement of self-efficacy and promotion of self-management behaviours and health outcomes [3-4]. Self-efficacy, being a major determinant of behaviour and behavioural change [5], has diverse applications in self-management of chronic disease [6], smoking cessation [7], alcohol use [8], eating [9], and pain control [10]. Self-efficacy is associated with better health outcomes and a greater sense of well-being, being a key mediator of the acquisition of self-management skills in chronic disease [4, 11-12], [5, 13].

The Self-Efficacy for Managing Chronic Disease (SEMCD) scale is a 6-item questionnaire that measures important chronic conditions domains, including fatigue, pain, emotional distress, symptoms, activity, and medication using self-management techniques [14]. The scale has been widely employed to assess self-efficacy for managing chronic conditions across several health outcomes [14]. The English-language version of the SEMCD scale has been validated in several studies, including 6 large samples of patients with chronic conditions enrolled in studies of self-management programmes [14] and in a scleroderma patient-centred intervention network cohort study [15].

Cognitive failures are based on minor errors reported by clinical and non-clinical individuals during everyday life [16-17]. Consistently high rates of cognitive failures have been associated with increased alcohol consumption [16] and schizotypy-a subclinical end spectrum of psychosis-proneness [18-20] and could reduce the success of social functioning [21]. These failures or minor slips indicate an individual's cognitive capacity, disrupt the smooth flow of intended physical or mental activity and are influenced by environment and daily activities [17]. Individuals' cognitive capacity, measuring cognitive performance in a particular situation, is fluid and varies with time and context [17] and can be affected not only by challenging tasks or chaotic situations [22] but also by boredom [23]. Thus, the cognitive capacity of chronic disease patients may be shaped on a momentary basis by their comorbidity levels and statuses and perhaps could be a reflection of the fluctuations observed in their performance in real life. At present, however, there is no measure of self-efficacy validated for chronic disease patients with varied cognitive failures. Therefore, the current study aimed to replicate former validation studies in chronic diseases and assess the impact of the SEMCD scale on patients' cognitive capacity.

2.0 Materials and Methods

2.1 Data Source

This study utilized part of a recently published health survey [16]. This was a cross-sectional data of 1299 participants (807 women, 492 men; aged 18 - 87 years) recruited from the southwest, Nigeria, across six public hospitals between March 2016 and April 2016. All subjects signed informed consent before recruitment for this study. Ethical clearance for the survey was obtained from the Tai Solarin University of Education Institutional Review Board. Inclusion criteria included being ≥18 years, having complete data on cognitive failures and SEMCD, and possessing ≥1 of 29 chronic conditions. The subjects excluded from this study had (1) serious illness, hearing or visual impairment impeding a dependable mental health assessment, (2) severe head problem or neurosurgery, (3) persistent impairment of consciousness, and (4) previously reported persistent mental retardation. The survey instrument was administered in English, while detailed descriptions of the study methodology had earlier been reported [16].

2.2 Measures

This research elicited responses about the basic socio-demographic characteristics of the subjects, such as age, sex, marital status, level of education, and ethnicity. The SEMCD scale [14] comprised 6 items and elicited responses about the participants' confidence ability to manage pain, fatigue, emotional issues, and other signs, and their confidence to do things apart from taking medicine to ease the effect of illness, and lastly to perform works minimize the need for consulting a doctor. The subjects were requested to indicate how confident they could do some tasks regularly at the current period. The survey items were graded on a scale of 1-10, representing "not confident at all" to "totally confident". The scale was scored by calculating the mean value of all the items, with lower scores corresponding to lower self-efficacy.

We also measured some other health-related outcomes such as self-rated health (1-item) [24], health care utilization (4 items, Cronbach α=0.82) [25], health interference (4 items, Cronbach α=0.83), shortness of breath (visual numerical) [25] and health distress (4 items, Cronbach α=0.83) [26]. Cognitive capacity was assessed and calculated from CFQ [27] earlier validated [16]. Principal component analysis revealed that the measure of cognitive capacity had a one-dimensional structure. Internal consistency was high (Cronbach α=0.93), and confirmatory factor analysis established that the scale was one-dimensional (NFI and CFI ≥ 0.90 [16]. In this study, high cognitive failures were used to show low or poor cognitive capacity.

2.3 Statistical Analyses

We used descriptive statistics first to describe the demography of the subjects. Scores for SEMCD, health distress, health interference, cognitive failures and shortness of breath were calculated as means±SD. Differences in the means of the health measures by the demographic groups were assessed using Analysis of Variance (ANOVA). The Kolmogorov–Smirnov test was used to check for normality, and Cronbach's alpha was used to test the internal consistencies of the SEMCD, the health distress and the health interference scales.

In addition, we used exploratory factor analysis (EFA) by conducting principal component analysis (PCA) to explore and replicate the single-factor model of the SEMCD questionnaire comprising 6 items. We also computed the means±SDs inter-item and corrected item-total correlations for each item of the SEMCD questionnaire with their factor loadings. We conducted the Kaiser-Meyer-Olkin (KMO) test for sampling adequacy and Bartlett's sphericity measure to assess the linear relationship level among the 6 items in the correlation matrix. Possible floor and ceiling effects were calculated as ≥15% of subjects with the minimum or maximum possible score [28], respectively.

Confirmatory factor analysis (CFA) was then performed to evaluate and validate the one-factor structure of the SEMCD questionnaire [14]. We ordered the item responses for the SEMCD scale and analyzed them by dealing with them as categorical variables. We then used the least square mean-and variance-adjusted weighted estimator and a one-factor solution [29] as a model for the ordered data. Model fit estimates such as the Chi-square test, Comparative Fit Index (CFI), Bentler-Bonnet Normed Fit Index (NFI), and Root Mean Square Error of Approximation (RMSEA) were employed to determine the dimensionality of the scale. We described good-fitting models as follows: a Chi-square p-value > 0.05, NFI and CFI ≥ 0.95 and RMSEA ≤ 0.06 [30], though acceptable model fit may include a CFI of ≥ 0.90 and a RMSEA of ≤ 0.08 [31]. Notably, the CFI is unaffected while the chi-square test and the NFI values may be affected by sample size [32]. Therefore, the CFI and RMSEA indices were stressed. After we did model fit as a first step, we performed a model refit by permitting the error estimates of highly related SEMCD items ($r \geq 0.79$) to covary. We later did a post hoc CFA test on a lower scale version by eliminating the item with the lower item-total correlation in each highly correlated pair. The residual correlation matrix from the one-factor CFA solution was used to estimate the local independence of the scale. The condition for the violation of the local independence was described as a residual correlation above 0.2 with any of the other test items [33].

We next carried out item response theory (IRT) analysis in the R programming environment [34] on the SEMCD scale to complement the results obtained using the above classical test theory (CTT) methods. A one-dimensional ordered response model [35-36] executed in the multidimensional IRT package (mirt; [37]) was used to assess the one-factor (i.e., single total SEMCD score) model item discrimination and item difficulty of the SEMCD. The discrimination estimate shows a slope, representing how accurate the item response options differentiate individuals having low from those with high levels of SEMCD. If high discrimination is observed, the item is helpful in supplying sufficient information about SEMCD differences among subjects. But if low, then the item may not be considered useful for supplying SEMCD differences among the subjects and may reveal items that warrant adjustment or removal. The item difficulty estimate displays where the item lies on the range of the latent feature (that is, SEMCD level). The

difficulty estimate (i.e. threshold scores) are taken as how high a person's SEMCD level should be so as to have a 50% probability of approving that given or higher response category. The difficulty estimate gives insight into how SEMCD level relate with specific response categories for the SEMCD items.

Lastly, we grouped SEMCD scores of the subjects into quintiles and their relationships with cognitive failures, health status and health care utilization outcome estimates were assessed using one-way ANOVA. Correlations of the SEMCD variables among themselves were performed by deploying Pearson Correlation Coefficients. All P-values were two-tailed, and $P<0.05$ was considered statistically significant. All analyses, except the IRT, were performed using SAS software version 9.1 (SAS Institute Inc., Cary, NC, USA).

3.0 Results

3.1 Demographic Characteristics

A demographic profile of the 1214 respondents is presented in Table 1. The values that do not add up to the total sample size are due to missing data from subjects who did not respond to some items. Participants ranged in age from 18 to 87 (mean age = 32.4 years). They were predominantly female (61.0%), of Yoruba origin (78.4%) and married (52.0%). The participants were mostly well educated, with 81.2% of the sample reporting having at least some college or university education. More than three-quarters of the participants (79.2%) indicated having at least good self-rated health.

3.2 SEMCD Characteristics

The item means, standard deviations, and inter-item correlation matrix are presented in Table 2. On a 10-point scale, where 1 = not at all confident to 10 = totally confident, the means ranged from 5.7 (Item 4: Symptoms) to 6.1 (Item 5: Activity). There were 47 subjects (5.4%) who had the lowest possible score (1.0) on the scale and 136 (11.2%) with the highest possible score (10.0) suggesting that that there were no substantive floor or ceiling effects. Examination of the correlation matrix indicated that all items correlated well $\geq |.65|$ ($p <.0001$) with one another. No inter-item correlation was greater than $r = .80$, thus indicating no problem with multicollinearity. Bartlett's test of sphericity was significant ($x2= 5974.149$, $p <.0001$), revealing that the correlation matrix was not an identity matrix. The KMO statistic (.90), which is an index that compares the level of the observed correlations with the level of the partial correlation coefficients, was "marvellous" based on the standards of 1974 set by Kaiser [38]. These outcomes suggest the suitability of factor analysis and might be expected to give common factors, and there was no concern for any of the 6 items in the correlation matrix. The item-to-total scale correlations ranged from 0.92 (Item 5) to 0.93 (Item 6). This range of item-total correlations was considered to be acceptable [39]. No items were eliminated because of redundancy or lack of homogeneity with the construct. Cronbach's alpha for the 6-item scale was .94.

3.3 Model fit

Results of the CFA (standardized solution) are shown in Table 3. The model fit for the hypothesized single-factor structure of the SEMCD scale in the initial analysis specifying

uncorrelated measurement errors between all six items was reasonably good (x2[9]58.8, p <.0001, NFI = .99, CFI = .99, and RMSEA = .07). Refitting the model by allowing the error terms of highly correlated items 2 and 4 (r = .79, p <.0001), as well as items 5 and 6 (r = .80, P < .001) to freely covary (items 2 and 4 evaluate keeping "physical discomfort or pains" and "other symptoms or health problems" from interfering with things you want to do, while items 5 and 6 evaluate the ability to engage in tasks or activities other than taking medication to "reduce the need for health care visits" or to "reduce the impact of the illness on everyday life") revealed a better fit (x2[6]5.6, p = .48, NFI = 1.00, CFI = 1.00, and RMSEA = .00). Finally, a post hoc CFA model fit evaluating a 4-item version of the SEMCD scale, which removed the item with the lower item-total correlation in each strongly correlated pair of items 2 and 4 and items 5 and 6 was also good (x2[1]1.3, P = .25, NFI = .99, CFI = .99, and RMSEA = .02). Inspection of the residual correlation matrix from the single factor CFA revealed that none of the items violated local independence (data not shown).

Table 1: Demographic Characteristics of the Sample (*N* = 1124)

Variables	*N	%
Age (years)[a]	32.4 ± 11.1	–
Gender		
Male	428	38.3
Female	690	61.7
Education		
No formal	10	.9
Primary school	41	3.8
High school	154	14.1
College	337	30.9
University	548	50.3
Ethnicity		
Yoruba	865	78.4
Hausa	37	3.4
Ibo	164	14.9
Other	37	3.4
Marital status		
Married	577	52.0
Single	470	42.4
Divorced	20	1.8
Separated	16	1.4
Widow(er)	26	2.3
Self-rated health		
Excellent	467	41.8
Good	418	37.4
Moderate	170	15.2
Poor	63	5.6
Morbidity		
1	413	36.7
2	325	28.9
3	198	17.6
4 or more	188	16.7
SEMCD Score (1 – 10)†[a]	34.8 ± 15.9	–
Cognitive complaints (0 – 5)[a]	42.3 ± 18.1	–
Health status‡		
Health distress (0 – 5)[a]	3.4 ± 3.8	–
Health interference (0 – 4)[a]	3.3 ± 3.3	–
Shortness of breath (1 – 10)[a]	2.5 ± 2.7	–
Health care utilization‡		
Physician visits (*n*, past 6 mo)[a]	1.4 ± 1.9	–
Emergency visits (*n*, past 6 mo)[a]	.7 ± 1.2	–
Hospitalizations (*n*, past 6 mo)[a]	.4 ± .7	–
Days in hospital (past 6 mo)[a]	.9 ± 1.9	–

*†A higher score is better. *Values may not add up to total sample size due to missing data ‡Subjects were asked to report utilization in the 6 months preceding the survey. [a]Mean* ± SD.

3. 4 Reliability & parameter estimates

Within the IRT framework, the 1-factor SEMCD scale yielded high reliability of .94. The IRT parameter estimates for item discrimination (i.e. slope) and item difficulty (i.e. thresholds) are presented in Table 4.

Table 2: Characteristics of the SEMCD Scale

		Correlation Matrix*					Corrected Item-total correlation	Factor loading	Communality
Variable	**Mean ± SD†**	**2**	**3**	**4**	**5**	**6**			
1. Fatigue	**5.7 ± 3.1**	**.74**	**.74**	**.73**	**.66**	**.66**	**.92**	**.87**	**.75**
2. Pain	**5.7 ± 3.1**		**.75**	**.79**	**.65**	**.66**	**.92**	**.88**	**.78**
3. Distress	**5.8 ± 3.1**			**.76**	**.67**	**.66**	**.92**	**.88**	**.77**
4. Symptoms	**5.7 ± 3.1**				**.67**	**.68**	**.92**	**.89**	**.79**
5. Activity	**6.1 ± 3.0**					**.80**	**.92**	**.85**	**.72**
6. Medication	**6.0 ± 3.0**						**.93**	**.86**	**.73**
Total	**5.8 ± 2.7**	–	–	–	–	–	–	–	–

†On a 10-point scale, where 1 = not at all confident and 10 = totally confident
* P <.0001 for all correlation values.

Discrimination estimates for the items ranged from 3.28 to 4.47, indicating that all items are well discriminated between low- and high-levels of SEMCD.

Table 3: Confirmatory factor analysis

Fit Parameter	Initial Analysis Value	Co-varying Error Value	Reduced SEMCD value
Goodness of Fit Index (GFI)	**1.00**	**1.00**	**1.00**
Pr > Chi-Square	**<.0001**	**.48**	**.25**
RMSEA Estimate	**.07**	**.00**	**.02**
Bentler's Comparative Fit Index	**.99**	**1.00**	**1.00**
Bentler & Bonett's (1980) NFI	**.99**	**1.00**	**1.00**

Difficulty parameter estimates indicated that patients with low SEMCD were less confident in ability to deal with health problems (i.e., lower score on the items) while patients with higher SEMCD were more confident in ability to deal with health problems (i.e. higher score on the items). These threshold parameter estimates indicate that the items were spread over the continuum of the SEMCD scale.

Table 4: IRT results presented as estimate (S.D.)

	IRT parameter estimates for the graded response model									
	Discrimination (slope)	Difficulty (Threshold)								
Item	**a**	**b1**	**b2**	**b3**	**b4**	**b5**	**b6**	**b7**	**b8**	**b9**
Fatigue	**3.97 (.19)**	**-1.21**	**-.89**	**-.60**	**-.41**	**-.16**	**.06**	**.31**	**.67**	**.99**
Pain	**4.40 (.22)**	**-1.19**	**-.84**	**-.64**	**-.41**	**-.15**	**.09**	**.30**	**.69**	**1.02**
Distress	**4.38 (.22)**	**-1.25**	**-.84**	**-.65**	**-.40**	**-.18**	**.03**	**.28**	**.63**	**.98**
Symptoms	**4.47 (.22)**	**-1.20**	**-.83**	**-.58**	**-.36**	**-.12**	**.09**	**.31**	**.64**	**1.00**
Activity	**3.28 (.16)**	**-1.42**	**-1.01**	**-.74**	**-.49**	**-.23**	**.02**	**.29**	**.59**	**.92**
Medication	**3.29 (.16)**	**-1.39**	**-.95**	**-.70**	**-.43**	**-.22**	**.03**	**.28**	**.64**	**.97**

Notes: a is the discrimination parameter (or slope) of the corresponding item on 1-factor solution. Given that each item had 10 item categories, there are 9 thresholds creating these 10 categories. The mirth package in R provides estimates for intercepts which can be transformed into threshold values for each item using the formula **(-d/a**), where **d** is the intercept value for the corresponding response category and **a** is the slope for the item.

In addition to these results, plots showing item-level information regarding the performance linked to each response category are shown as supplementary figure (Supplementary Figure). These plots link directly to the item discriminations provided in Table 4. These plots, as expected, revealed that

items with larger discrimination levels showed narrowed probability densities with the density peaks for each response category concentrated over a relatively narrow range of the latent trait values (x-axis). Conversely, items with lower discrimination values had the response category probability densities that are relatively spread out across the range of the latent trait scores.

3. 5 Construct validity and connections between SEMCD scores and cognitive failures

As shown in Table 5, there were significant inverse correlations between the SEMCD scale (as a continuous variable) and cognitive failures, as well as measures of health status and health care utilization: the higher the SEMCD, the lower the cognitive failures (r = -.10), the lower the health status outcome measures (-.26 — -.10) and the lower the outcome measures for health care utilization (-.24 — -.12). Overall, all correlations between SEMCD and health outcomes were expected and gave evidence of modest construct validity. None changed substantively in post hoc analyses. The results were quite similar when SEMCD was analyzed by category dividing the subjects into five different quintiles. Among these five SEMCD categories, the mean scores of all health status measures and health care utilization differed significantly (Supplementary Table). The connections between all health measures classified by SEMCD were somewhat straightforward: mean score was highest in the second category and lowest in the fifth category, and the pair-wise differences within the five SEMCD categories were most statistically significant.

Table 5. Correlation of Health Variables with the Self-Efficacy for Managing Chronic Disease Scale

	Pearson's correlations	*P*
Mental health		
Cognitive complaints	**-.10**	**.0156**
Health status		
Health distress	**-.24**	**< .0001**
Health interference	**-.26**	**< .0001**
Shortness of breath	**-.10**	**.0010**
Health care utilization		
Physician visits	**-.12**	**.0002**
ED visits	**-.24**	**< .0001**
Hospitalizations	**-.17**	**< .0001**
Days in hospital	**-.13**	**< .0001**

E.D., Emergency Department

4.0 Discussion

This study assessed the validity and reliability of the SEMCD scale in Nigerian chronic disease sample with varied cognitive failures and revealed the scale had very good internal consistency reliability, high inter-item correlations and communalities and modest construct validity, and that there were no floor or ceiling effects. In addition, we found evidence for a unidimensionality model of a scale that best reflected the SEMCD data; the model fit was acceptable, and there were no issues with item fit or local dependence. Moreover, the scale differed in expected ways on several health characteristics, with a higher quintile of self-efficacy seen among participants with low measures of cognitive failures, low measures of health status (health distress, health interference and shortness of breath) and low measures of health care utilization (physician visits, emergency department visits, hospitalizations and days in hospital). Previous studies examining the measurement properties of the SEMCD scale in a scleroderma patient-centred intervention network cohort study [15] and in 6 English-language samples of patients with various chronic illnesses [14] reported a single-factor structure with high internal consistencies and convergent validity with measures of health for the scale. Our

finding corroborates these earlier results and confirms that the SEMCD-6 scale is a valid measure of self-efficacy in patients with chronic illnesses and diverse cognitive capacity in a developing country like Nigeria. To the best of our knowledge, this is the first study in Africa to examine the psychometric properties of the English version of the SEMCD using IRT and CTT approaches. While CTT was used exclusively to provide evidence of validity and reliability of the scale, the IRT-based approach not only hinted at the evidence of reliability but was also able to provide information about the individual items, including the ability to discriminate across different levels of the SEMCD scale and the information provided by each response category. This level of detail surrounding the items extends the information obtained using the factor loading matrix in CTT. It is thus particularly noteworthy that the dual approaches adopted in this study illustrate how IRT and CTT models can be used to assess the structure and individual items on a questionnaire.

In the present study, we found that the correlations of the SEMCD with cognitive failures and measures of health and health care utilization were all significant, but they were low, suggesting modest evidence of construct validity for the SEMCD scale in Nigeria. Notably, better validity coefficients have been reported for this scale in other studies mostly in developed countries [15, 40], however, those studies utilized health outcomes other than the ones reported in the present study. It is also possible that the scale only has modest evidence of construct validity in a low-resource setting like Nigeria. While our findings on the relationships between SEMCD and health and health care measures should be interpreted with caution, it is particularly noteworthy that the CFQ score was connected to self-efficacy. A statistically significant but low negative correlation between cognitive failures and SEMCD has both public health and theoretical relevance. This is because minor impacts on health outcomes could have profound societal implications. More importantly, Kazdin [41] has pointed out that small effect sizes in the company of theoretical underpinnings can have a major impact on understanding the phenomenon of interest. In the current study, for example, the relationship between self-efficacy and cognitive failures is accompanied by a theoretical explanation regarding the fluctuations in cognitive performance resulting from chronic diseases that are often observed in real life.

The present study thus raises the question of whether it is the cognitive failures that predict self-efficacy or vice versa. Does the tendency of cognitive failures make chronic disease patients show less confidence in their ability to deal with health problems? Or does a higher self-efficacy make chronic disease patients experience cognitive failures differently? While the latter might be true in this study, the affirmative conclusions could only be drawn from longitudinal and intervention studies.

4.1 Strengths and Limitations

Our study used a fairly large (n=1124) sample for the CTT and IRT analyses. We believe the available number of patients was more than sufficient for this study. Notably, IRT and analytic approaches for our SEMCD scale with six indicators require much lower sample size than available for this study: ≥ 500 sample for IRT and a sample of 60 ─ 190 for factor loadings of .5 ─ .8 for CTT [42]. In

addition, we have used a sample size that provided us with a 95% CI and precision of .1 to detect a correlation value less than .1 [43]. Moreover, we used two different but complementary approaches to assess the psychometric properties of the SEMCD scale further strengthen the validity and reliability of its use in Nigeria. More importantly, the SEMCD scale showed consistency in direction with all employed indices of construct validity. Other strengths are that common chronic diseases were studied. Nearly all possible chronic diseases were included in the count of morbidities. Thus, the exploration of the cultural adaptation of the SEMCD scale and its findings demonstrated the feasibility of using the SEMCD to reliably collect self-efficacy data in a diverse segment of the Nigerian chronic disease patients with various cognitive capacity states.

However, several significant limitations should be considered when interpreting the results. Our study depended upon self-report data for all of the variables used. Thus, incorrect reporting of cognitive complaints, self-efficacy levels or chronic disease status may have affected the results. In addition, participants with worse self-rated health may recall more diagnoses and indicate low self-efficacy. The severity and duration of conditions were not elicited in this study. Future studies would benefit from direct health outcome assessment to reduce reporting errors. Another limitation of the study is the use of a non-probability sampling technique, which may have limited generalisability to other samples of Nigerians with different demographic characteristics. In addition, most participants have more than high school education with potentially higher comprehension and recall ability than may be found in the general population. Nevertheless, recruitment from three different States and six different public hospital settings allowed for a sample with substantial heterogeneity in demographic indices.

4.2 Implications of Findings

This study has implications for primary healthcare management and future research in chronic diseases. Primary health care is central to providing patient-centred care for patients with chronic illnesses. Self-efficacy elicited from patients may contribute to one of the tools for enabling care for patients with multiple chronic conditions and varied cognitive capacity. Thus, eliciting self-efficacy among chronic disease patients may help to identify a group at risk of poor cognitive function, especially during the diagnosis of chronic disease patients with mental health issues. An approach could aim interventions at those chronic disease patients with high cognitive failures (i.e., low cognitive capacity) who report low self-efficacy. Provision of care for such patients should also focus on improving, among other health outcomes, the cognitive and other mental aspects of their health and health care utilization. The findings of this study raise questions for further research, especially the extent to which self-efficacy fulfils the criteria for screening for chronic illnesses in varied cognitive capacity states; the longitudinal study is needed to confirm the relationship between chronic disease severity and variability in cognitive capacity. Development of studies to explore in greater detail the subjective health of chronic disease patients with low cognitive capacity and to elicit further information on what lies behind the significant rise in low subjective self-

efficacy as cognitive failures increase would be of value. Exploration of discordant findings such as factors associated with high self-efficacy in the face of low cognitive capacity may also be fruitful.

5.0 Conclusion

In conclusion, as the validity and reliability of the SEMCD-6 scale appeared to be good in this chronic disease sample of Nigerians with varied cognitive capacity and a range of health outcomes, usability of the instrument as an outcome measure to evaluate the effectiveness of self-management programmes in mental health was corroborated. Connections of the scale with all health status measures and health care utilization were following previous findings: higher levels of these measures were associated with lower self-efficacy management. Our results suggest that the SEMCD is a psychologically sound and valid instrument for measuring self-efficacy in chronic disease patients with varied cognitive capacity in Nigeria.

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