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Psychometric Properties of Newly Translated Creole Perceived Stress Scale and Daily Hassles Scale

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Background: Mothers with postpartum stress have increased maternal/infant morbidity and mortality. Haitians, a growing minority excluded from most studies because of the lack of instruments in Creole. The Perceived Stress Scale (PSS) and the Daily Hassles Scale (DHS) measuring stress are not available in Creole. Purpose: To test the psychometrics of the newly translated Creole instruments. Methods: A convenience sample of 85 Haitian mothers completed 2 instruments in Creole and English, 2 weeks apart using the process of cross-cultural adaptation. Result: Internal consistency reliability and stability were strong for both instruments (.80–.94). Reliability and validity support the translated Creole with this sample of Creole speaking mothers. Conclusion: Psychometric findings suggest the newly translated versions are good representations of the English versions and are ready for use.

Keywords: Creole Perceived Stress Scale (PSS); Creole Daily Hassles Scale (DHS); psychometric; mothers; postpartum mothers; stress life

Stress in postpartum mothers results in increased rates of maternal and infant morbidity and mortality especially those with limited health care access (Cohen & Janicki-Deverts, 2012; Corwin et al., 2013; Dunkel Schetter et al., 2013). The incidence of maternal and infant mortality is higher in minority mothers and infants compared to nonminorities. Mortality rates for minority mothers are 36.4 deaths per 100,000 live births compared to 11.7 deaths per 100,000 live births for nonminority mothers (Centers for Disease Control and Prevention [CDC], 2014). The mortality rate for infants born to minority mothers is almost double (11.4 vs. 6.0 per 1,000 live births) that of nonminority infants (Hoyert & Xu, 2012). Research indicates that when these mothers experience increased stress, health outcomes for both mothers and newborns decline (Corwin et al., 2013; Fatma et al., 2013; Redmond et al., 2013). This is true for minority mothers' especially Haitian mothers.

Haitians, one of the fastest growing minority groups in the United States number nearly 1 million (United States Census Bureau, 2010), and their numbers are projected to increase 50% by 2025 (Migration Policy Institute, 2014a). Despite their growing numbers, more than half (54%) of the U.S. Haitian population are limited in English proficiency

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(Migration Policy Institute, 2014a). This minority group with limited English proficiently, is more likely to live in poverty and experience more stress (Migration Policy Institute, 2014b). Haitians are underrepresented in research, especially in the areas of stress and health outcomes for postpartum mothers and infants. However, research to examine stress in this minority group is extremely limited because of the lack of instruments in the Creole language. The most widely used instruments for measuring stress are the Perceived Stress Scale (PSS) and the Daily Hassles Scale (DHS). Currently, there are no published studies on the psychometric properties of the PSS or the DHS in Creole. English versions of these instruments have reported strong reliability and validity and have also been translated in many other languages with reported strong reliability and validity. Having reliable and valid Creole versions of these instruments would allow examination of postpartum stress in Haitian mothers. Such data would contribute toward reaching two of the eight United Nations' Development Goals for the Millennium to reduce child mortality and to improve maternal health. Therefore, purpose of this study was to test and compare the reliability and construct validity of the newly translated Creole versions and the original English versions of the PSS and DHS with a sample of bilingual (Creole/English) mothers.

CONCEPTUAL BASIS AND DEVELOPMENT OF THE INSTRUMENTS

The PSS developed by Cohen, Kamarck, and Mermelstein (1983), is the most widely used psychological instrument for measuring the perception of one's stress. It is a self-reported questionnaire that measures the degree to which situations in one's life are appraised as stressful (Cohen et al., 1983). The PSS-14, the initial instrument developed is a 14-item scale. The items tap into how unpredictable, uncontrollable, and overloaded respondents find their lives. The PSS also inquires about current levels of experienced stress, feelings, and thoughts during the last month and how often they felt a certain way on a 5-point Likert scale (0 = *never* to 4 = *very often*). They are worded in a simplistic nature making it applicable to any population group. There are three versions of the PSS; the PSS-14, PSS-10, and the PSS-4. Higher summative scores indicate greater perceived stress. The PSS-10 takes 5–10 minutes to complete.

Validity of the PSS was obtained by factor analysis (Cohen & Williamson, 1988) with four items having low factor loadings. The PSS-10 (a 10-item scale) emerged by dropping the four items that had low factor loadings on the PSS-14. Five years after the development of the PSS-14, a shorter version emerged; the PSS-4 (a four-item scale). The shorter version instrument was developed with the items selected from original version of the PSS-14. The suggested uses for the shorter scale PSS-4 are for situations such as telephone interviews (Cohen et al., 1983). The PSS-10 allows the assessment of perceived stress with a slight gain in psychometric quality compared to the PSS-14 (Cronbach's alpha = .78 vs. .75; Cohen & Williamson, 1988).

Factor analysis of the PSS using the principal components method with varimax rotation revealed items that loaded positively on the first factor. The highest loadings were negatively worded items (e.g., been upset, unable to control things, felt nervous and stressed). The second factor consisted of positively phrased statements (e.g., dealt successfully with hassles, effectively coping, felt confident). Cohen and Williamson (1988) first tested the validity in 1983 in a sample collected by the Harris poll. The sample included 2,387 U.S. residents (1,427 women, 960 men), with a mean age of 42.8 years.

The questionnaire was administered by a telephone interview. Positive correlations (r = .14–.39) were found between the PSS and other stress measures (i.e., life events, self-reported health, job-related responsibilities). Validity is also supported with moderate correlation (r = −.27) between PSS and life change scores with 105 first time mothers 35 years old and older at 1 month after delivery (Reece, 1995) and between PSS scores and the number of life events subjects experienced within the last year (r = .30; Cohen et al., 1983). Thorp, Krause, Cukrowicz, and Lynch (2004) in a study of 49 postpartum White women reported a moderate correlation (r = .43) between the PSS and the Communication Patterns Questionnaire-Revised (CPQ-R; Christensen, 1987, 1988; Christensen & Sullaway, 1984) which measures the dyadic communication in relationships when problems arise and a strong correlation (r = .67) between the PSS and the State Trait Anxiety Inventory (STAI)—Form Y which was developed by Spielberger, Gorsuch, and Lushene (1970) with sample of early postmenopausal Chinese women (Yu & Ho, 2010) measuring anxiety. Turner et al. (2013) reported moderate-to-strong correlations (r = .35–.86) in a sample of 44 multiethnic women between the PSS and the STAI measuring anxiety, and the Infertility Self-Efficacy Scale (ISES) scores at 3 time points. Chaaya, Osman, Naassan, and Mahfoud (2010) reported similar findings with the PSS-10 and the General Health Questionnaire (GHQ-12) and the Edinburgh Postpartum Depression Scale (EPDS; r = .45–.67) in a sample of 210 Arabic pregnant and postpartum women.

Cohen et al. (1983) first tested the internal reliability of the PSS-10 obtaining a coefficient Cronbach's alpha of .78 in a sample of 2,387 U.S. residents. Thorp et al. (2004) reported high internal consistency (.90) with postpartum women 8 weeks after delivery. Reece (1995) reported similar findings (.75–.83) examining maternal stress 1 year after delivery in older primiparas. Chaaya et al. (2010) reported the overall internal consistency reliability of the Arabic PSS-10 with Cronbach's alpha of .74 which ranged from .71 for postpartum women to .75 for pregnant women. Gao, Chan, and Mao (2008) reported reliabilities of .78 in a sample of 130 Chinese first time mothers.

The DHS, developed by Lazarus and Folkman (1984) to measure everyday sources of stress and annoyance is a 53-item self-report used as an alternative to the Life Events Inventory (Holmes & Rahe, 1967). Lazarus and Folkman (1984) developed the DHS by examining other measures and created a list of 117 hassles that was considered sources of stress experienced daily by the general population. The117-item instrument was tested by Kaiser Permanente Health Maintenance Organization (Nofsinger, 1977) with a sample of patients. From the results of this study, items were added, modified, or eliminated. A shorter version of the DHS was developed by eliminating and combining items that tapped into similar content areas, eliminating items that confounded with outcomes, and rewording items to a more generally phrased item resulting in a 53-item scale. Items include relationships (children, parents, in-laws, and other relatives), job-related duties, financial obligations, social commitments, and household responsibilities. Participants select the degree of stress experienced in the last 4 weeks for each item on a 6-point rating scale from 5 (*a lot*) to 1 (*very little*)," with 0 as *did not occur*. Higher summative scores indicate greater stress. The DHS takes 5–10 minutes to complete.

Factor analysis of the DHS using the principal factor method with oblique rotation, resulted in eight factors: future security, time pressures, work, household responsibilities, health concerns, inner concerns, financial obligations, and neighborhood and environmental concerns. The DHS, initial test for validity was in a sample of 100 participants (52 women, 48 men), aged 45–64 years in a 12-month study examining stress, coping, and emotions (Kanner, Coyne, Schaefer, & Lazarus, 1981). The questionnaire was

self-administered monthly for 9 months. Its validity was supported by strong correlations (r = .55–.66) between the DHS and an instrument measuring psychological symptoms of anxiety and depression; The Hopkins Symptom Checklist (Derogatis, Covi, Lipman, & Rickels, 1970; Derogatis, Lipman, Covi, & Rickels, 1971). Zauszniewski, Picot, Debanne, Roberts, and Wykle (2002) reported the validity in a sample of 213 African American women by correlations between DHS scores and the Depressive Cognition Scale (r = .31). Positive correlations (r = .24–.44) between the DHS and the Affect Intensity Measure (Larsen, Diener, & Emmons, 1986) were reported with a sample of 52 healthy pregnant women examining stress (DiPietro, Hilton, Hawkins, Costigan, & Pressman, 2002) Another study reported correlations of .27 between the DHS and the Rosenberg Self-Esteem Scale (Rosenberg, 1965) in a sample of 235 adult Dominican immigrant women (Panchanadeswaran & Dawson, 2011)

Kanner, Coyne, Schaefer, and Lazarus (1981) initially tested the reliability of the DHS by item stability by averaging correlations based on repeated measurement (test–retest). Traditional psychometric reliability was not used because the items in the DHS are considered fluctuating psychological stress responses. The DHS scores from each of the time were correlated and then averaged over a 9-month period. Hassles frequency scores over the 9-month time were stable (.79). Others have reported coefficient alpha of .96 in a sample of African American women (Zauszniewski et al., 2002) and 86 in a diverse sample of women pregnant women (MacKey, Williams, & Tiller, 2000). Panchanadeswaran and Dawson (2011) reported internal reliability of .92 with a sample of 235 immigrant Dominican women.

Unfortunately, the PSS and the DHS are not available in Creole. To examine the psychometric properties of the newly translated PSS and DHS, the study questions were as follows:

1. What are the internal consistency and stability (test–retest) reliabilities of the Creole and English versions of the PSS and the DHS at two different time points 2 weeks apart? Is the reliability similar for the Creole and English versions of the PSS and DHS at each time point and across time?
2. Are the scores obtained on the Creole and English versions similar at each time point?
3. Are the Creole and English PSS and DHS scores at each time point related to number of years living in the United States, income, health concerns, and education? Are the correlations of the Creole and English version similar for both time points and across time points?

METHOD

Sample

A convenience sample of 85 Haitian mothers was recruited among faculty, staff, and students at Florida International University (FIU) and their friends using personal contacts. *Inclusion criteria*: Haitian mothers, 18 years of age or older and able to read both English and Creole. *Exclusion criteria*: Haitian women without children and not bilingual (Creole/English), were unable to read in Creole and English or any condition that prohibited completion of the study instruments.

Measures

The PSS and the DHS were administered to Haitian mother participants. The Creole versions of the PSS and the DHS were followed by the English versions. All mothers completed both instruments a second time 2 weeks later.

Number of years living in United States. Mothers were asked to indicate the total number of years they have lived in the United States.

Family emotional support was measured by asking the mothers to indicate their perceived emotional support received from family members. The options ranged from 1 *very strongly disagree* to 7 *very strongly agree*.

Health concerns was measured by asking the mothers if they have any health concerns. Options were yes, I have health concerns or no, I do not have health concerns.

Education was measured by having mothers select their highest level of education completed. The seven-range options went from a low 1 (less than high school) to a high of 7 (doctoral degree).

Annual income was measured by having the mothers select the income range that best described their total family income. The six options ranged from a low of 1 (less than $10,000/year) to a high of 6 (more than $50,000 or more/year).

This study was conducted in two phases using the cross-cultural adaptation process. Forward translation and back-translation were used to develop the Creole version of the PSS and the DHS. All of the items on the PSS and DHS were first translated into Creole separately by two Haitian Creole speaking Florida International University (FIU) graduate nursing students. These two translations were then compared and consensus reached for any differences in translation. The instruments were then translated back into English by a second group of two Haitian Creole speaking FIU graduate nursing students who had not seen the English version. These two translations were then compared and consensus reached for any differences in translation. The back-translated English versions and the original English versions were compared by the study team for equivalence of meaning as follows. When differences between the two English versions (original and translated) occurred, the research team and six different Creole speaking graduate nursing students discussed the meaning of the original English item. After reaching an agreement, the Creole speaking graduate nursing students approved the Creole wording that most closely related to the meaning of the English item.

Procedure

The study was approved by the Internal Review Board of Florida International University. Haitian mothers 18 years and older in the South Florida area were recruited for the study. Graduate nursing students in FIU's nursing program recruited Haitian mothers through friends, family classmates, and from local community places they attended (i.e., churches, social functions). The graduate nursing students explained the study to the potential mothers, screened for inclusion and exclusion criteria, and answered their questions. Mothers meeting the study criteria and who agreed to participate were asked to sign a consent form. Following informed consent, mothers completed the PSS and the DHS in both English and Creole and the demographic form in English only. Two weeks after completion of the initial instruments, all mothers completed the same two instruments again for test–retest reliability. All mothers were given a $5 gift card each time they completed their questionnaires. Descriptive statistics (mean, standard deviation, and percentage) were calculated with all variables. The reliability and validity of the Creole and English versions of the PSS and DHS were tested and compared at each time point and across time. Internal consistency reliability was measured by alpha coefficient and test–retest by Pearson's correlations. Validity was assessed using paired *t* test and Pearson's correlation between the PSS and the DHS scores with the number of years living in the United States, emotional support, health concerns, education, and income. All data analyses were performed using SPSS Version 21.0.

RESULTS

Sample

Eighty-five Haitian mothers between the ages of 20 and 72 years were recruited into the study (Table 1). The majority of the mothers were born in Haiti (91.8%) with a mean of 20.4 years living in the United States. Most of the mothers were employed (77.6%), were college graduates (75.3%), were partnered (62.4%), and almost half (43.6%) earned $30,000 or less annually (43.6%). Creole was their primary language (Table 2).

Reliability Testing

The newly translated Creole and English versions of the PSS had Cronbach's alphas that were similar at both time points (.75–.85). Stability reliability was supported by strong test–retest correlations using Pearson product-moment correlation after a 2-week interval for both the Creole and the English versions (r = .88 and .84). The internal consistency and stability reliabilities of the newly translated Creole version of the PSS are supported by these results (Table 3).

Internal consistency reliability of the Creole and English versions of the DHS had Cronbach's alphas that were similar to the newly translated Creole version and the original English version (.91–.94). Stability reliability was supported by strong test–retest correlations using Pearson product-moment correlation after a 2-week interval (.80–.94). Internal

TABLE 1. Sample Characteristics (N = 85)

Characteristic		
Age (years): *M* (*SD*)		45.8 (11.1)
Birthplace: *n* (%)	Haiti	78 (91.8%)
	United States	7 (8.2%)
Education: *n* (%)	High school graduate	21 (24.7%)
	College graduate	64 (75.3%)
Partner status: *n* (%)	Partnered	53 (62.4%)
	Not partnered	32 (37.6%)
Number of children: *n* (%)	1–3	68 (80.0%)
	four or more	17 (20.0%)
Employment: *n* (%)	Employed	66 (77.6%)
	Not employed	19 (22.4%)
Annual income: *n* (%)	<$30,000	37 (43.6%)
	$40,000–$59,999	9 (10.6%)
	$60,000 or more	24 (28.3%)
	No answer	15 (17.5%)
Years living in the United States	*M* (*SD*)	20.4 (12.3)
Percentage of life in the United States	45.4%	

TABLE 2. Language Used Most Often

Daily	Creole	25 (29.4%)
	English	8 (9.4%)
	Both	52 (61.2%)
At work: *n* (%)	Creole	16 (19.0%)
	English	36 (42.4%)
	Both	32 (38.6%)
At home: *n* (%)	Creole	72 (84.7%)
	English	5 (5.9%)
	Both	8 (9.4%)

consistency and stability reliabilities of the newly translated Creole version of the DHS are supported by these results (see Table 3).

Validity Testing

The total scores on the Creole and English versions were compared for the PSS and DHS at both time points for validity testing. In addition, hypothesis testing with correlations of Time 1 and Time 2 PSS and DHS total scores on the Creole and English version to the number of years living in the United States, emotional support received from family members, health concerns, education, and income. The means on the English and Creole versions total scores of the PSS and the DHS were very similar and the results of the

TABLE 3. Reliability Testing of Creole and English Versions

Measure	Type of Reliability	Language	Value
Perceived Stress Scale	Internal consistency Time 1	English	.82
		Creole	.82
	Internal consistency Time 2	English	.75
		Creole	.78
	Stability test–retest correlations	English	$r = .84$[a]
		Creole	$r = .88$[a]
Daily Hassles Scale	Internal consistency Time 1	English	.94
		Creole	.94
	Internal consistency Time 2	English	.91
		Creole	.93
	Stability test–retest correlations	English	$r = .94$[a]
		Creole	$r = .80$[a]

[a]Pearson-product moment correlation.

TABLE 4. Validity Testing of Creole and English Versions

Measure	Time Point	Language: English *M* (*SD*)	Language: Creole *M* (*SD*)	Paired *t* value
Perceived Stress Scale	T1	17.2 (6.6)	17.4 (6.6)	−0.98
	T2	18.2 (5.3)	18.2 (5.6)	0.35
Daily Hassles Scale	T1	47.6 (23.7)	48.1 (24.2)	−1.02
	T2	47.8 (23.4)	48.5 (22.1)	−0.52

Variable	Language	Years Living in United States	Family Emotional Support	Health Concerns	Education	Income
Perceived Stress Scale	English	$r = -.23$*	$r = -.18$	$r = .37$	$r = -.12$	$r = -.14$
	Creole	$r = -.26$*	$r = -.14$	$r = .36$	$r = -.15$	$r = -.18$
Daily Hassles Scale	English	$r = -.23$	$r = -.24$*	$r = .12$	$r = -.07$	$r = .05$
	Creole	$r = -.20$	$r = -.23$*	$r = .10$	$r = -.06$	$r = .07$

Note. T = time.
*$p < .05$.

paired *t* tests at both time points were not significantly different (Table 4). Correlations with Pearson product-moment between the total scores on the English and Creole versions of the PSS and the DHS were strong at both time points.

Correlations of the total scores on the English and Creole versions of the PSS and the DHS with the number of years living in the United States, emotional support received from family members, health concerns, education and income were compared at each time point to examine the validity of the newly translated Creole versions. Although two of these correlations were significant, the magnitudes of the correlations for the Creole and English versions of the PSS and DHS were similar and all were in the expected direction (Table 4). Low income Haitian mothers with the least number of years living in the United States with little family support and education perceived themselves to have more stress and significantly more daily hassles.

DISCUSSION

The results of this study indicate that the psychometric findings for newly translated Creole PSS and the Creole DHS Creole are good representations of the English versions with this sample of Creole speaking mothers. Internal consistency reliability and stability over a 2- to 3-week period were strong for the English and Creole versions for both instruments. Stability of this study's reliability for the English versions was similar to that reported in other studies. Thorp et al. (2004) found reliabilities of the PSS to be .90 in their study with 49 postpartum White mothers 8 weeks after delivery, and Gao et al. (2008) reported reliabilities of .78 in a sample of 130 Chinese first time mothers. Zauszniewski et al. (2002)

reported a Cronbach's alpha of .96 for the DHS in their sample of 213 African American women. Panchanadeswaran and Dawson (2011) reported similar results of the DHS (.92) in a study of 235 immigrant Dominican women. Others also reported strong reliability for the DHS (Holm & Holroyd 1992; Kanner et al., 1981).

Results of this study support the validity of the two versions of both the PSS and the DHS. Total scores on the English and Creole versions of the PSS and the DHS were not statistically different at both time points. The Creole and English versions at both time points had similar means and standard deviations. Total scores on the Creole and English versions of the PSS and DHS were strongly correlated.

Direction and magnitude of the correlations between the Creole versions of the PSS and the DHS with the number of years living in the United States, emotional support received from family members, health concerns, education, and income were similar to the corresponding correlations for the English versions. There was a significant negative correlation with number of years living in the United States and women experiencing increased stress and daily hassles. As expected, mothers reporting low emotional support from their family perceived themselves as having significantly more daily hassles and increased stress. Another expected positive correlation was mothers' perceived stress and daily hassles increased in lower income, less educated women with concerns about their health.

Limitations

The limitations of this study include a sample of largely college educated Haitian mothers who were graduates from universities in Haiti or from the United States. These mothers were more educated than most other minority immigrants. However, including participants with limited English proficiency would not allow complete psychometric testing of the translated Creole versions of the PSS and the DHS. It is recommended to conduct a test–retest of an instrument with bilingual participants using the two versions to establish that it is reliable both across time (two administrations, usually 2 weeks apart) and through measuring its internal consistency. The results are then recommended to be compared to the original source language version (English) of the instrument to the translated language (Creole) version (Chavez & Canino, 2005; Maneesriwongul & Dixon, 2004; Lee, Li, Arai, & Puntillo, 2009).

The Creole-speaking population in South Florida is a good representation of the Haitian people. Having native Creole speakers to participate in the item translation, back-translation, and discussion of the final wording for each item, the study team was able to produce much need translated Creole instruments to measure stress in postpartum women.

The data reported in this study are from a homogeneous sample of Haitian mothers of varying socioeconomic status. Data from the general Haitian population may differ from those reported earlier. Testing of the Creole versions of the PSS and the DHS with other Creole-speaking groups, particularly a less educated Haitian sample is recommended to address and examine these limitations.

Implications for Practice

The Creole version of the PSS and the DHS will allow health care providers to assess the degree of stress in Creole speaking postpartum mothers, additional tools not previously

available. Use of these tools in Creole will allow mothers who speak only Creole to be evaluated for their postpartum stress by health care providers. This knowledge will increase understanding of Haitian mothers' well-being and help identify mothers and infants most at risk for poor health outcomes and in need of interventions.

CONCLUSION

In summary, reliability and validity evidence for our newly translated Creole versions of the PSS and the DHS are very good and are equivalent to the reliability and validity estimates for the English version. Results suggest that our translation process was successful. Having these instruments available in Creole, non-English-speaking Haitian mothers who are currently excluded from studies for the lack of study instruments in Creole will make it possible to recruit this understudied population. Including Creole-speaking mothers in studies will provide more accurate data on postpartum stress which can be used to improve maternal and infant health outcomes.

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