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Clinically Identified Postpartum Depression in Asian American Mothers

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Abstract

Objective—To identify the clinical diagnosis rate of postpartum depression (PPD) in Asian American subgroups (Asian Indian, Chinese, Filipino, Japanese, Korean, Vietnamese) compared to non-Hispanic Whites.

Design—Cross-sectional study using electronic health records (EHR).

Setting—A large, outpatient, multiservice clinic in Northern California.

Participants—A diverse clinical population of non-Hispanic White ($N = 4582$), Asian Indian ($N = 1264$), Chinese ($N = 1160$), Filipino ($N = 347$), Japanese ($N = 124$), Korean ($N = 183$), and Vietnamese ($N = 147$) mothers.

Methods—Cases of PPD were identified from EHRs using physician diagnosis codes, medication usage, and age standardized for comparison. The relationship between PPD and other demographic variables (race/ethnicity, maternal age, delivery type, marital status, and infant gender) were examined in a multivariate logistic regression model.

Results—The PPD diagnosis rate for all Asian American mothers in aggregate was significantly lower than the diagnosis rate in non-Hispanic White mothers. Moreover, of the six Asian American subgroups, PPD diagnosis rates for Asian Indian, Chinese, and Filipino mothers were significantly lower than non-Hispanic White mothers. In multivariate analyses, race/ethnicity, age, and cesarean were significant predictors of PPD.

Conclusion—In this insured population, PPD diagnosis rates were lower among Asian Americans, with variability in rates across the individual Asian American subgroups. It is unclear whether these lower rates are due to underreporting, underdiagnosis, or underutilization of mental health care in this setting.

Keywords

postpartum depression; Asian American; subgroups; clinically identified

Postpartum depression (PPD) is defined as the onset of any depressive episode occurring between 2 weeks and 12 months after childbirth (American Psychiatric Association [APA], 1994; Gaynes, 2005; Sichel & Driscoll, 2002). This well-documented phenomenon continues to be a leading cause of maternal morbidity and mortality in new mothers (Postpartum Support International, 2009). Very little research on PPD has been conducted in different racial/ethnic groups, and there are only a few studies that have included Asian American mothers (Cheng & Pickler, 2009; Dietz et al., 2007; Goyal, Murphy, & Cohen, 2006; Hayes, Ta, Hurwitz, Mitchell-Box, & Fuddy, 2010; Huang, Wong, Ronzio, & Yu, 2007). The lack of Asian Americans in study samples is of concern, given that Asian Americans are among the fastest growing minority populations in the United States (Ong, 2001). The number of Asian Americans, at more than 14.5 million, is projected to reach nearly 34 million by 2050 (U.S. Census Bureau, 2010a). According to 2010 U.S. Census data, 85.1% of Asian Americans belong to one of the six largest racial/ethnic subgroups: Asian Indian (19.4%), Chinese (22.8%), Filipino (17.4%), Japanese (5.2%), Korean (9.7%), and Vietnamese (10.6%), with subgroup population ranging in size from 763,000 (Japanese) to 3.3 million (Chinese) (U.S. Census Bureau, 2010b). Although Asian Americans account for only 4.8% of the total U.S. population, they constitute 13% of California's population. More than 36% of all Asian Americans live in California (U.S. Census Bureau, 2010b).

Given the growing Asian American population in the United States, it is critical for clinicians and health care providers taking care of childbearing mothers to be aware of the rates of PPD in Asian American mothers and to consider the unique culture-specific barriers for reporting PPD symptoms and accessing mental health care services. Previous research has suggested that although Asian Americans are more likely to have access to health care through employment, they are less likely to seek and obtain mental health care services (Kaiser Family Foundation, 2008). Ta and colleagues (Ta & Chen, 2008; Ta, Juon, Gielen, Steinwachs, & Duggan, 2008) noted that Asian mothers are less likely to obtain help for mental illness, even after controlling for socioeconomic and health insurance status. Women from diverse racial/ethnic backgrounds are less likely than non-Hispanic White (NHW) women to seek help for PPD (S. Chan & Levy, 2004; S. W. Chan, Levy, Chung, & Lee, 2002; Huang et al., 2007; Teng, Robertson, Blackmore, & Stewart, 2007), and among mothers reporting depression, Asian mothers were significantly less likely to receive mental

health services compared to NHW mothers (Ta & Chen). Moreover, mental illness is highly stigmatized in Asian cultures, contributing to the underutilization of mental health care services (Chong et al., 2007; Georg Hsu et al., 2008; Huang et al.; Ta et al.; Teng et al.; Wynaden et al. 2005). These factors may contribute to the underreporting of PPD symptoms and/or the underdiagnosis of PPD by health care providers.

Theoretical Framework

Transition theory (Schumacher & Meleis, 1994) provided the theoretical framework for this research. Schumacher and Meleis (1994) defined *transition* as a process that humans experience when faced with life and/or environmental change. Furthermore, an individual's response to a transition is dependent on several factors, including perceptions and expectations of the change, knowledge and skill to handle the change, experience of working through the change, and the individual's level of physical and mental well-being (Chick & Meleis, 1986; Schumacher & Meleis, 1994). The authors discussed several types of transitions, including developmental, situational, and health/illness related that may include changes in health status or relationships, the addition of a new family member(s), and moving from one life phase to another.

New mothers are likely to face all of these transitions during the postpartum period. The transition from a nonparental to parental role requires redefining each person's role in the family. This may be hindered in Asian families as cultural postpartum traditions include a prescribed rest period lasting up to 8 weeks. Several Asian subgroups (e.g., Asian Indian, Chinese, Korean, Vietnamese) believe that new postpartum mothers must rest and remain confined to their homes for a specified period of time. Women in India are advised to remain at home for up to 8 weeks after giving birth, largely to protect the mother and infant from illness and ward off evil spirits (Choudhry, 1997). Chinese mothers have a similar practice of "doing the month," where female relatives take over care and household duties for 30 to 40 days in an effort to ward off disease (Cheng & Pickler, 2009). Korean and Vietnamese mothers are also encouraged to stay at home for an extended period of time after the birth of an infant (Ministry of Health and Welfare, 2007).

Postpartum depression is a well-documented phenomenon that continues to be a leading cause of maternal morbidity and mortality in new mothers of all racial/ethnic groups.

The extent to which these practices are extended in immigrant families and specific effects on PPD clinical diagnosis rates is unknown. Although a new mother may want to "parent" her new infant, the prescribed rest period may limit her caregiving duties. Household responsibilities including cooking, cleaning, and taking care of infant needs are generally taken over by other females in the household so the new mother can rest (Choudhry, 1997; Kim-Goodwin, 2003). Additionally, extended family members may accompany mothers to postpartum visits, decreasing the likelihood that depressive symptoms will be frankly reported and discussed with clinicians (Ramaswamy, Shah, & Ahad, 1997).

Transition theory has been used as a guiding framework in several studies examining the human experience of life changes or changes in environment including research focused on

developing nursing interventions to support adults recovering from major depression (Skärsäter & Willman, 2006), transition to motherhood in African American women (Sawyer, 1999), and the experiences of Asian and Korean immigrant women going through menopause (Im, 2010; Im & Meleis, 1999).

Background

Postpartum depression affects 10% to 20% of all mothers in Western societies (Centers for Disease Control & Prevention, 2010; Dobie & Walker, 1992; Kumar & Robson, 1984; O'Hara & Swain, 1996). If left untreated, PPD can affect the maternal/child bond (Beck, 1995, 1996a, 1996b), the infant's cognitive development (Beck, 1998), and early childhood cognitive and language development (Sohr-Preston & Scaramella, 2006). It can lead to compromised family dynamics (Tammentie, Tarkka, Astedt-Kurki, Paavilainen, & Laippala, 2004), maternal suicidal ideation (Georgiopoulos, Bryan, Wollan, & Yawn, 2001), and infanticide (Kelly, 2002; Peel, 2001; Spinelli, 2004).

Several biological and psychological/social risk factors have been identified in the development of PPD. Biological risk factors include young maternal age (Hayes et al., 2010; Mayberry, Horowitz, & Declercq, 2007) and sleep disturbance/fragmentation (Gay, Lee, & Lee, 2004; Goyal, Gay, & Lee, 2007; Swain, O'Hara, Starr, & Gorman, 1997). Psychological/social risk factors include onset of depression during the pregnancy, level of social support (Beck, 2001), relationship satisfaction, infant temperament, and socioeconomic status (Beck; Goyal, Gay, & Lee, 2010; Segre, O'Hara, Arndt, & Stuart, 2007).

Additionally, infant gender has emerged as a psychological/social risk factor for developing PPD, specifically in Asian cultures where male infants are generally preferred over female infants (Kim & Buist, 2005; Winkvist & Akhtar, 2000). Previous researchers have suggested a relationship between female infant gender and the development of PPD (C. L. Chan et al., 2002; Choudhry, 1997; Gao, Chan, You, & Li, 2010; Rodrigues, Patel, Jaswal, & de Souza, 2003; Xie et al., 2007; Xie et al., 2011).

Asian Mothers and Postpartum Depression

Researchers examining PPD in Asian countries demonstrated a wide range of prevalence, ranging from 3.5% (Malaysia) to 63% (Pakistan) (Klainin & Arthur, 2009). To date, very little research in Asian countries has examined clinically diagnosed PPD using a structured clinical diagnostic interview. Chandran, Tharyan, Muliyl, and Abraham (2002) conducted interviews ($N = 301$) during the postpartum period (mean weeks 9.8; $SD = 2.2$) with mothers living in India using the Clinical Interview Schedule (Lewis, Pelosi, Araya, & Dunn, 1992) and found an 11% incidence of PPD. Kitamura and colleagues (2006) assessed PPD in Japanese mothers ($N = 290$) during the first 3 months postpartum and noted a 5% incidence of PPD with the Structured Interview (DSM-III-R) (APA, 1994).

Within the United States, the majority of PPD research has been conducted in NHW populations. In most studies examining PPD in Asian American mothers (Cheng & Pickler, 2009; Goyal et al., 2006; Hayes et al., 2010; Huang et al., 2007), researchers used self-report

scales (e.g., Postpartum Depression Screening Scale, Center for Epidemiologic Studies Depression Scale, Edinburgh Postnatal Depression Scale) to identify postpartum depressive symptoms. Goyal and colleagues (2006) collected primary data and identified postpartum depressive symptoms in a convenience sample of 58 self-identified Asian Indian women between 2 weeks and 12 months postpartum. Mothers self-reported intensity of depressive symptoms using the 35-item Postpartum Depression Screening Scale (Beck & Gable, 2000), with 52% ($N = 30$) scoring in the depressive symptom range.

Cheng and Pickler (2009) surveyed Chinese American mothers ($N = 152$) with the 20-item, self-report Center for Epidemiologic Studies Depression Scale (CES-D; Radloff, 1986). Depressive symptoms were measured at 6 months postpartum with 23.7% ($N = 36$) of the mothers scoring above the cutoff score. In a large population-based study, Hayes and colleagues (2010) identified disparities in self-reported PPD among Asian ($N = 3,449$), Hawaiian ($N = 1,549$), and Pacific Islander ($N = 443$) women compared to NHW women ($N = 1,345$) between 10 to 39 weeks postpartum ($M = 17.4$ weeks). Depressive symptoms were assessed with the two-item self-report Patient Health Questionnaire (Kroenke, Spitzer, & Williams, 2003), and results suggested that Chinese, Filipino, Japanese, and Korean women were more likely to screen positive for PPD symptoms than NHWs.

In another large population-based study, Huang and colleagues (2007) assessed self-reported depressive symptoms with the 20-item CES-D (Radloff, 1986) in 7,676 mothers within the first-year postpartum, including 12% ($N = 918$) Asian mothers (Asian Indian, Chinese, Filipino, Japanese, Korean, Vietnamese). Results suggested foreign-born Asian mothers were more likely to self-disclose depressive symptoms than Asian American mothers. Moderate depressive symptoms (score 10–14) ranged from 5.7% in Japanese mothers to 16% in Filipino mothers and severe depressive symptoms (score 15) ranged from 2.8% in Asian Indian mothers to 9.6% in Filipino mothers.

Although the above studies demonstrate high rates of self-reported postpartum depressive symptoms in specific Asian American groups (e.g., Asian Indian, Chinese, Filipino), data from an aggregated clinical population have shown the opposite. Dietz and colleagues (2007) identified PPD using International Classification of Diseases (ICD-9) diagnosis codes or use of antidepressant medications in mothers ($N = 4,398$) up to 39 weeks postpartum from Kaiser Permanente Northwest. Among all women in the study, 15.4% suffered from depression at some time before, during, and/or after their pregnancy. Asian mothers ($N = 384$) were grouped together (specific Asian subgroup information was not reported or available) and were found 80% less likely to be identified with depression than White mothers.

Thus far, researchers have not investigated PPD from electronic health records (EHR) in a large, disaggregated Asian American sample with representation from the six largest Asian American subgroups (Asian Indian, Chinese, Filipino, Japanese, Korean, and Vietnamese). Therefore, we sought to determine the clinical diagnosis rate of PPD and examine novel risk factors, such as infant gender, in a large, racially/ethnically diverse population of Asian Americans compared with NHW mothers in Northern California.

Research Design and Methods

Setting

The Palo Alto Medical Foundation/Palo Alto Division (PAMF) is a large, community-based, multispecialty ambulatory care system in Northern California. The PAMF has 24 medical centers, more than 900 physicians, and more than 744,000 active patients. The PAMF patient population is racially and ethnically diverse, including NHWs (59%) and Asian Americans (33%). Patients from the PAMF service areas (Alameda, San Mateo, and Santa Clara counties) represent all of the six major Asian American subgroups, in proportions similar to the surrounding catchment areas. The PAMF health care system includes preferred provider organization (PPO) (66%), health maintenance organization (HMO) (18%), Medicare/Medi-Cal (11%), and self-payers (5%). The EpicCare EHR system has been in use since 2000 (Epic Electronic Health Record Software, n.d.). Administrative, billing, prescription, and clinical information are available for every patient seen throughout the system since its implementation.

Study Design

We created an observational cross-sectional data set of Asian American and NHW women between age 18 and 45 at the time of birth. All mothers who gave birth to a single, live infant between January 1, 2007 to June 30, 2010 were included ($N = 7,807$) in the data set. Maternal characteristics, including maternal age, birth type, and marital status, were extracted from the EHR. Marital status was supplemented with publicly available California state birth records when information was otherwise missing (15%) (California Department of Public Health), which was only available for 2007-2008. Birth type was determined using Current Procedural Terminology (CPT) procedure codes. Depression during the observation period was operationalized by physician recorded ICD-9 diagnosis codes between 2 weeks to 12 months postpartum. Depression was also identified from clinician-prescribed antidepressant medications (selective serotonin reuptake inhibitors, tricyclic antidepressants, monoamine oxidase inhibitors, nontricyclic antidepressants). Infant gender was determined by EHR and supplemented with publicly available California state birth records when missing (23%). Race/ethnicity classification was determined by self-report, based on the Census 2010 format, (Palaniappan, Wong, Shin, Moreno, & Otero-Sabogal, 2009) and supplemented with given names and surnames using a validated algorithm (Wong, Palaniappan, & Lauderdale, 2010) when race/ethnicity information was otherwise missing. All analysis files used in this project were HIPAA-compliant, deidentified data sets (National Institutes of Health, 2004) to maintain the utmost patient security and protection and were approved by the PAMF and San Jose State University Institutional Review Boards.

Statistical Analysis

A standard two-sample comparison procedure was used to analyze demographic variables. Age of the mothers at birth in different groups were compared using a two-sample t test; binary outcomes such as delivery type (cesarean vs. vaginal), self-reported marital status, and infant gender were compared between groups using the two-sample test of proportions. To account for multiple testing, p values were adjusted using Holm's procedure (Holm, 1979). Age-adjusted PPD diagnosis rates from ICD-9 codes and/or medications were

calculated in each racial/ethnic group through direct standardization to the PAMF NHW age-sex distribution. For direct standardization, the continuous age variable was broken down into the following categories (18–25, 26–30, 31–35, 36–45 years) and 95% and 99.9% confidence intervals used for statistical inference.

A logistic regression model was also constructed to examine any association between PPD and covariates, including race/ethnicity, maternal age (continuous), delivery type, marital status (married vs. not), and infant gender. Odds ratios, associated *p* values, and 95% confidence intervals were produced from the logistic model and used to guide inferences. All statistical analyses were performed using SAS 9.2.

The age-adjusted postpartum depression diagnosis rate of all Asian American mothers (4.6%) was significantly lower than that of non-Hispanic White mothers (9.1%, $p < 0.001$).

Results

Demographics

A total of 7,807 eligible records including 3,225 (41.3%) Asian American mothers and 4,582 NHW mothers were included in this study (Table 1). Sample size among Asian American racial/ethnic subgroups ranged from the smallest (Japanese, $n = 124$) to the largest (Asian Indian, $n = 1264$). Mean age at delivery also differed across racial/ethnic groups, ranging from younger Asian Indian mothers (31.5; $SD = 3.5$ years) to older Japanese American mothers (35.5; $SD = 4.3$ years). Asian Indian and Filipino (32.5; $SD = 4.7$) mothers were significantly younger than NHW mothers (33.2; $SD = 4.9$) at the time of delivery ($p < 0.05$), whereas Chinese (34.6; $SD = 3.8$) and Japanese mothers were significantly older ($p < 0.05$). Asian Indian, Chinese, and Korean mothers had a significantly higher rate of documented married status compared with NHW mothers ($p < 0.05$). Cesarean section rates ranged across race/ethnic groups with the lowest rate, 27.9%, noted in Korean mothers and the highest rate, 34.1%, noted in Asian Indian mothers. Infant gender also varied across racial/ethnic groups with the lowest proportion (35.3%) of male infants noted in Vietnamese mothers and the highest proportion (57.6%) of male infants observed in Filipino mothers.

Rates of Postpartum Depression

The age-adjusted PPD diagnosis rate of all Asian American mothers (4.6%) was significantly lower than that of NHW mothers (9.1%, $p < 0.001$) (Figure 1). When adjusted for age using direct standardization, PPD diagnosis rates ranged from 4.0% in Chinese mothers to 9.1% in NHW mothers. Asian American subgroup analysis revealed PPD diagnosis rates for Asian Indian (5.0%), Chinese (4.0%), and Filipino (4.9%) mothers were significantly lower than NHW mothers (Asian Indian and Chinese $p < 0.001$, Filipino $p < 0.05$).

Using logistic regression, we found no association between PPD and infant gender or documented marital status. However, after adjustment for other covariates (delivery type, marital status, and infant gender) for each 5-year increase in maternal age, the odds of PPD

increased (odds ratio [OR] = 1.12, 95% confidence interval [CI]: [1.02, 1.23]; $p = 0.02$). Diagnosis of PPD was also more common in women who underwent a cesarean compared to vaginal birth (OR = 1.2, 95% CI [1.01, 1.45]; $p = 0.04$).

Discussion and Clinical Implications

This study is the first to provide information on the clinical diagnosis rate of PPD in six Asian American subgroups compared to NHW mothers. Diagnosis rates of PPD in NHW mothers (9.1%) in this study are consistent with findings from previous studies (Centers for Disease Control & Prevention, 2010; Dobie & Walker, 1992; Kumar & Robson, 1984; O'Hara & Swain, 1996). Findings of this study suggest a significantly lower clinical diagnosis rate of PPD in Asian American mothers compared to NHW mothers, which is consistent with findings of Dietz et al. (2007), though the sample size of Asian Americans in this study was nearly 10 times larger ($N = 384$ vs. 3,225).

Although our findings are similar to other studies conducted in the United States (Dietz et al., 2007), they are not consistent with findings from countries of origin with reported PPD rates of up to 63% (Klainin & Arthur, 2009). Of note, Klainin and Arthur reviewed 64 studies, 17 of which represented the Asian subgroups discussed in this study. Of the 17 studies reviewed, only Kitamura et al. (2006) clinically identified PPD using Diagnostic and Statistical Manual for Psychiatric Disorders (*DSM-III-R*) (APA, 1994), whereas the remaining studies all identified depressive symptoms largely with the EDPS (Cox, Holden, & Sagovsky, 1987) and the Beck Depression Inventory (Beck, Steer, & Brown, 1996). Several factors cited in the literature, including stigma and mental health underutilization, may explain the observed disconnect between our findings and studies that were conducted in countries of origin (Chong et al., 2007; Huang et al., 2007; Ta et al., 2008; Wynaden et al., 2005). Other considerations for lower diagnosis rates in this study sample include underreporting of PPD symptoms and/or underdiagnosis of PPD by health care providers.

Schumacher and Meleis's (1994) transition theory provided the framework for this study examining developmental (motherhood), situational (motherhood, addition of family member, acculturation), and health/illness (depression) related transitions among postpartum mothers. Given the secondary analysis design of this study, researchers were unable to assess certain variables (help seeking and cultural barriers to accessing mental health care cultural beliefs, attitudes, meaning of motherhood, acculturation, culture-specific traditions) that may have contributed to the low PPD rates noted in this study. However, a prospective, mixed-methods research design may have provided additional insight into the multifaceted transition to motherhood among Asian Americans and NHW mothers.

Previous studies in Asian countries have reported a relationship between female infant gender and PPD (C. L. Chan et al., 2002; S. Chan & Levy, 2004; Choudhry, 1997; Gao et al., 2010; Rodrigues et al., 2003; Xie et al., 2007). We did not observe this relationship in this study. This may be due to the overall lower clinical diagnosis rates of PPD in Asian Americans in the study. Acculturation may also play a role in the underreporting of depressive symptoms, (Leong & Lau, 2001) and should be examined in future studies of PPD in Asian Americans.

Lower rates of postpartum depression in Asian American mothers may be due to underreporting, underdiagnosis, or underutilization of mental health care services.

Limitations/Future Research

The main limitation of this study is the observational study design. As with all observational study designs, selection bias is the strongest limitation. The patients in this clinical study may differ systematically from patients in the general population with respect to variables of interest, such as marital status, socioeconomic status, and acculturation level. Data from this clinical population are limited to one specific Northern California subpopulation, which may limit generalizability. The scope of these results should therefore be interpreted with caution and restricted only to other similar patient populations.

Other limitations include the secondary research design. Using existing data from an outpatient setting did not allow for analysis of other known PPD risk factors such as parity, nativity, gestational age, neonatal intensive care unit admissions, newborn illness/conditions at birth, previous history of maternal depression, social support, socioeconomic status, and acculturation level. With limited resources, we were not able to examine whether diagnosed patients received mental health care appointments, nor did we address adherence to prescribed medications. Future research should focus on examining PPD diagnosis among Asian American subgroups. Moreover, given the cultural barriers surrounding mental health help seeking in Asian Americans and the stigma of mental illness in Asian American cultures, further research must also include qualitative inquiry to better understand the reasons for nonreporting and/or underreporting of PPD symptoms to health care providers, mental health care underutilization, and reasons for underdiagnosis by health care providers.

Transition theory should be considered as the framework in future research given that PPD includes several types of transitions (developmental, situational, health/illness) discussed by Meleis and her colleagues. Meleis (2010) also discussed transition theory as a framework that may help identify specific stages or milestones during the life span to determine which health care interventions are needed along with the type of care needed. Interventions such as development of culturally acceptable depressive illness treatment modalities and strategic development of a culturally acceptable tool to identify depressive symptoms will be key factors in Asian American mothers' receiving timely diagnosis and treatment for PPD.

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Figure 1.

Age-adjusted postpartum depression (PPD) diagnosis rates (95% CI).

NHW = non-Hispanic White, AS = Asian (all), AI = Asian Indian, CH = Chinese, FI = Filipino, JA = Japanese, KO = Korean, VI = Vietnamese.

* $p < 0.05$, ** $p < 0.001$ compared to NHWs.

Table 1
Demographics and Descriptive Data (N = 7807)

Race/Ethnicity	Total N (%)	Maternal Age $\pm$ (SD)	Cesarean Section (%)	Married (%)	Male Infant (%)
Non-Hispanic White	4582 (58.7)	33.2 (4.9)	32.6	74.6	52.3
Asian (All)	3225 (41.3)	33.1 (4.1)	31.6	86.9 [*]	52.4
Asian Indian	1264 (16.2)	31.5 (3.5) [*]	34.1	94.1 [*]	53.5
Chinese	1160 (14.9)	34.6 (3.8) [*]	29.0	83.8 [*]	52.5
Filipino	347 (4.4)	32.5 (4.7) [*]	32.9	73.7	57.6
Japanese	124 (1.6)	35.5 (4.3) [*]	31.5	83.2	48.4
Korean	183 (2.3)	34.0 (3.6)	27.9	86.8 [*]	47.6
Vietnamese	147 (1.9)	33.5 (4.9)	33.3	81.6	35.3 [*]

SD = standard deviation.

^{*} $p < 0.05$, compared to NHWs.