Psychometric Properties of the KPAS in Diverse Ethnic Groups of Midlife Women

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Abstract

Although the Kaiser Physical Activity Survey (KPAS) was a potential instrument for cross cultural research of midlife women, little information is available on its reliability and validity among multi-ethnic groups of midlife women. The purpose of the study was to evaluate the reliability and validity of the KPAS in estimating physical activity among 341 diverse ethnic women. Internal consistency was adequate for all ethnic groups except N-H African Americans. The construct validity was identified through group comparisons and factor analysis. In group comparisons, physical activity differences among diverse ethnic groups were similar to results of previous studies using the KPAS. Eight factors were extracted among all ethnic groups except N-H Asian Americans. In the convergent validity test, N-H African Americans and N-H Asian Americans showed particular patterns. Overall, the KPAS was a reliable instrument and was reasonably accurate in assessing physical activities for any multi-ethnic groups of midlife women. However, cultural sensitivity among N-H African Americans and N-H Asian Americans need to be further examined.

Keywords

Internal consistency; construct validity; convergent validity; physical activity; ethnicity; midlife; women

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These last two decades have seen considerable growth in the field of ethnic and racial identity research (Dandy et al., 2008). With growing research and policy interest in the relations among different ethnic groups, there has been an increasing pressure for researchers to consider cultural specifics while using research tools.

Physical activity (PA) is a concept widely used in many disciplines within a variety of cultural groups (Craig et al., 2003). In general, PA was less prevalent among women than men and among Blacks and Hispanics than among Whites. Kendzor et al. (2008) published a study on race/ethnicity and multiple cancer risk factors. Their study found multiple risk behaviors, such as overweight/obesity, at-risk alcohol consumption, and insufficient PA, which were significantly higher among Latinos and African Americans than Caucasians. Kruger et al. (2008), who studied data collected by the 2005 Behavioral Risk Factor Surveillance System, found that the prevalence of inactivity was highest among Hispanic

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men (41.9%) and women (42.4%). A study using the National Physical Activity and Weight Loss Survey data (Marshall et al., 2007) reported that age-adjusted prevalence of leisure-time inactivity was 9.9% +/− 0.6 SE (standard error) and 12.0 +/− 0.6 for White men and women, respectively; 19.0 +/− 2.5 and 25.2 +/− 2.1 for non-Hispanic black men and women, and 20.9 +/− 2.1 and 27.3 +/− 2.5 for Hispanic men and women.

As the US population continues to grow and diversify, there is a need for progressive PA measurement and cross-cultural research (Martinez, 2008). A number of instruments have been developed to measure PA level (Kriska et al., 1997; Wilson, Paffenbarger, Morris, & Havlik, 1986; Sallis et al., 1985). According to an article on the measurement of PA, over 30 different instruments existed (LaPorte, Montoye, & Casperson, 1985), however, most PA questionnaire were designed without regard to ethnicity or with mostly data collected from a White population (Kriska et al., 1997). Also, most do not consider either gender or age (Cauley, Laporte, Sandler, Schramm, and Kriska, 1987). Therefore PA questionnaires designed for White women may be less sensitive to differences in activity levels among different ethnic women.

Adapted from the Baecke physical activity survey, the Kaiser Physical Activity Survey (KPAS) is a questionnaire designed to assess PA of women. Unique features of the KPAS include the assessment of multiple domains of PA (household/caring, occupational, actual living, and sports/exercise activity) (Schmidt et al., 2006). These domains provide a fairly comprehensive evaluation of a woman's total spectrum of activity (Cauley et al., 1987). Its additional advantage is that it can be self-administered. Also, some studies showed that the KPAS was an instrument that had potential for cross cultural research of midlife women. In 1999, Sternfeld et al. published a study of PA patterns using the KPAS. This study found that women exhibiting the highest level of participation in sports/exercise and actual living activity were more likely to be young, White, college-educated, and without young children at home. In contrast, women with a high level of household/caring activities were more likely to be older, married, Hispanic, and with young children at home. In another study using the KPAS, women with the highest level of participation in occupational activity during pregnancy were more likely to be older and college-educated. These women also tend to have a higher income and fewer children. Women with the highest level of household/caregiving activity were more likely to be older, U.S. born, and with more children (Chasan-Taber et. al., 2007).

In previous research, evaluation of the KPAS reliability was assessed by evaluating test-retest reliability. These results were 0.79 to 0.91 during 1 month (Ainsworth et al., 1999). For a sample of 63 participants, intraclass correlation coefficient was 0.84 (Schmidt et al., 2006). The validity of the KPAS has been tested by using an objective and subjective comparison measure of PA with an Actigraph accelerometer, Pregnancy Physical Activity Questionnaire (PPAQ), and PA records. The results of these studies showed that the KPAS was reasonably accurate in detecting regular household/caring, occupational, actual living, and sports/exercise activities among women and pregnant women. However, little information is available for reliability and validity of KPAS among multi-ethnic groups of middle women.

Researchers have emphasized the importance of conducting psychometric evaluations of the instruments to establish their validity and reliability before using them in a cross-cultural setting (Oliver & Mahon, 2006). When measures are used from different ethnic groups, researchers should consider specific concepts such as social norms, moral values, and beliefs. These concepts can affect the reliability and validity of the measurement results (Waltz et al., 2005). Martinez et al. (2008) identified and evaluated the adoption and/or translation methods of 13 measures. These measures have been used to assess the PA

patterns of Latinos, and were recommended to evaluate the culturally relevant self-report measures for accuracy in the target population.

Therefore, the purpose of this study was to evaluate the reliability and validity of the KPAS in estimating PA among diverse ethnic women (Hispanic, Non-Hispanic (N-H) African American, N-H Asian American, and N-H White). Specific goals were 1) to estimate the reliability of the KPAS measures of total activity as well as subscales of household/caring, occupational, actual living, and sports/exercise activity; 2) to estimate the construct validity of the KPAS measures using factor analysis and comparison PA levels with other articles; 3) to estimate convergent validity using intercorrelations of subscales with each other and with the total score.

Theoretical basis

The Social Cognitive Theory (SCT) that systematically addresses personal and environmental factors (Baranowski, Perry, & Parcel, 2002) has been widely used for health behavior studies. According to the SCT (Bandura, 1997), behavior such as PA, is mainly influenced by cognitions such as attitudes, perceived behavior control, self-efficacy, health beliefs, or risk perception (Velde, Wind, Lenthe, Klepp, & Brug, 2006). Overall, this study was based on the general idea that the more distal determinants of PA could be found in the cultural and social environment affecting cognitions.

A feminist perspective was also used as the theoretical basis of this study. Throughout the research process of this study, it was assumed that physical inactivity by ethnic minority women may come from women's interactions with their environments. Also, all feminist theories posit gender as a significant factor that interacts with race/ethnicity to structure relationships among individuals (Ruzek et al., 1997). This study showed ethnicity as one of the most significant characteristics that explains women's physical inactivity.

In summary, this study was based on the STC and feminist perspective. This study also assumed that not only genetic factors, but also culture cognitions such as health beliefs, customs, and/or traditions were the cause of this ethnic difference in PA. Given that racial/ethnic differences have been reported in PA (Saint Onge & Krueger, 2008; Kendzor et al., 2008; Kruger et al., 2008; Siu & Doyle, 2003), an important undertaking is to examine if psychometric properties of instruments among diverse ethnicity exist.

Methods

This study was conducted as part of a larger internet study on ethnic specific midlife women's attitudes toward physical activity (eMAPA). This study was a comparative psychometric test, which compared the reliability and validity of the KPAS in diverse ethnic women.

Setting and participants

Recent studies among ethnic minority women have suggested that the use of internet communities for midlife women (ICMWs) and internet communities for ethnic minorities (ICEMs) (Baehring et al., 1997; Barrera et al., 2002; Bowker & Liu, 2001), have demonstrated the importance of using multiple methods for recruitments (Im & Chee, 2008).

The eMAPA study was announced through ICMWs and ICEMs identified through Google, MSN, and Yahoo searches. A total of 341 women were recruited via announcements posted on ICMWs and ICEMs. Total contacted number of ICMWs was 2,309 and that of ICEMs

was 4,421 (765 for Hispanic, 451 for N-H African American, 3,150 for N-H Asian American, and 55 for General).

Inclusion criteria were established for enrollment of women in the eMAPA internet study. Criteria include women who were online in the U.S. and who were able to complete the study questionnaire and informed consent. Eligibility requirements included: (a) 40 to 60 years old, (b) familiarity with the internet as a medium of communication with regular access to e-mail and the web, (c) Hispanic, Non-Hispanic (N-H) African American, N-H Asian American, or N-H Whites as self-reported ethnic identity, (d) ability to read and write English, and (e) willingness to comply with the university's institutional review board for studies involving human subjects.

A total of 341 women participated in the eMAPA internet survey, among them, 28% were Hispanic, 23% were N-H African American, 18% were N-H Asian American, and 31% were N-H White. The average age of the participants was 49.18 years (SD=5.80). About 70 percent of the participants reported their education level as college graduates or graduate degrees. Thirty-five percent of participants were Protestants. Sixty-seven percent were married or partnered, and 85 percent were employed. Fifty-seven percent reported their income levels as "not hard to meet basic needs." About 77 percent were born in the U.S. The mean body mass index (BMI) was 28.68 (SD=6.87). Thirty-three percent of the participants were pre-menopausal; 32% were post-menopausal; 15% were surgical menopause; 17% were early peri-menopausal; and 4% were late peri-menopausal (table 1).The sample size of 341 participants is adequate for analysis of psychometric properties. To detect a difference among groups in assessing construct validity, a sample size of 42 participants for each ethnic group (total=168) is needed with an alpha of 0.05 and statistical power of 80% (An et al., 2008). Pearson correlation was used to test for convergent validity. A moderate correlation between variables is considered meaningful. To detect a moderate correlation (r = 0.30), a sample of 64 (total=256) analyzable subjects provides 80% power to discover a correlation that is statistically different from a zero correlation at 0.05 significance (Cohen et al., 2003). A moderate correlation of about 0.20 was assumed based on the findings of previous studies (Schmidt et al., 2006;Ainsworth et al., 2000).

Instruments

The Kaiser Physical Activity Survey (KPAS)—The KPSA is a self-administered instrument designed to obtain information about women's PA habits. In this study, a modified version of the KPAS, which Ainsworth et al. developed by modifying the Baecke Habitual Physical Activity Questionnaire, was used to evaluate the KPAS in estimating PA among diverse ethnic women. Questions in the KPAS consisted of four subscales: household/caring activities, occupational activities, active living habits, and sports/exercise activities. Activity indices were created for each domain of activity by summing the domain-specific categorical responses and dividing by the number of items. For the household/caring index, the average categorical responses to questions about the hours per day or week spent in household/caring activities were calculated. Occupational activities were calculated as an average of 5-level categorical responses to questions about occupational activity, and intensity of occupational activity based on The Netherlands Nutrition Council (1979). Active living habits were calculated as the average of 5-level categorical responses to questions on active living habits items. For Sports/exercise activities, respondents were asked to identify the frequency and duration for their three most frequent sports/exercise activities performed in the past year. Sports were subdivided into three levels of PA according to Durnin and Passmore (1967). (See the Appendix)

Sociodemographic characteristics—Questions on age, education, religion, marital status, employment, family income level, country of birth, body weight, height, menopausal status, and self-reported ethnicity were used to describe sociodemographic characteristics of the participants. For data analysis, body mass index (BMI) was calculated by dividing self-reported weight (kg) by self-reported height (m^2) at the time of the Internet survey. Menopause status was determined through asking about their last menstrual cycle and menstrual regularity, and was defined as premenopausal, early perimenopause, late perimenopause, and postmenopause. Self-reported ethnicity was assessed using ethnicity questions required in NIH guidelines.

Data collection procedures

For data collection, the eMAPA website was set up based on the Health Insurance Portability and Accountability Act (HIPAA) and SysAdmin, Audit, Network, Security Institute (SANS)/FBI recommendations and consisted of informed consent forms and internet survey question.

Research assistants who matched up with this study's target ethnicity groups searched and contacted the ICMWs and ICEMs. Through the websites, web pages, and e-mail lists of ICMWs and ICEMs, research assistants announced the eMAPA study. Potential participants, who responded to the study's announcement with an interest in participating in the study, were first asked to agree to the informed consent. Then, they took an eligibility test that checked each potential participant under several criteria including age, mobility, literacy, internet access, ethnicity, and socioeconomic status (SES). Only those who met these eMAPA study inclusion criteria were granted access to the research survey questionnaire. During this survey, several random questions were repeated to check for consistency and identification verification purposes.

Data analysis

Data was analyzed using the Statistical Analysis System (SAS Institute, Cary, NC) version 8.1. Those participants who had less than 10% missing values were included in the final analysis.

To describe sociodemographic characteristics of participants, descriptive statistics were used including frequency, percentage, mean, and standard deviation.

Internal consistency reliability, assessed by Cronbach's alpha coefficients, was defined as the degree to which groups of test questions measured a single construct. A Cronbach alpha coefficient of above 0.7 indicated acceptable internal consistency reliability of group comparisons (Streiner & Norman, 2003).

In assessing construct validity, which was the ability of an instrument to measure an abstract concept, mean of the KPAS for ethnic groups were tabulated. An analysis of variance (ANOVA) was used to test for significant differences between ethnic groups. In addition, factor analysis was performed using factor extraction and factor rotation. Factor extraction involved the screen plot, which implicated a graph of each eigenvalue against the factor with which it was associated. Generally, all factors with eigenvalues greater than 1 were retained (Kaiser, 1974). After factors were extracted, factor rotation involved a calculation to determine degree variables load on these extracted factors. The adequacy of the sampling for factor analysis was calculated by the Kaiser-Meyer-Olkin (KMO) statistic; its values ranged from 0 to 1. KMO values those were greater than 0.5 were acceptable measures for sampling adequacy (Kaiser, 1974).

Finally, to examine convergent validity, intercorrelation coefficients of subscales were calculated to compare them with each other and to compare them with the total score of the KPAS.

Results

Internal consistency reliability

Table 2 summarizes the Cronbach's alpha coefficients of the KPAS according to ethnicity. Results indicated adequate internal consistency of the KPAS total scores for all ethnic groups except N-H African Americans. Cronbach's alpha coefficients ranged from 0.70 to 0.73 for Household/caring activity, from 0.78 to 0.81 for Occupational activity, and from 0.82 to 0.87 for Sports/exercise activity. However, Cronbach's alpha coefficients of the Actual living habits were not acceptable for all ethnic groups.

Construct validity; group comparison

In the comparing the KPAS according to ethnicity, Hispanic participants showed the highest total scores on the KPAS, followed by N-H White. In household/caring activity and actual living habits category, again scores of Hispanic participants were higher than the other ethnic groups. In occupational activity, N-H White participants scored the highest. In sports/exercise activity, N-H Asian participants scored the highest.

Based on the results of the ANOVA, there were significant differences in occupational activity between N-H African Americans, N-H Whites and N-H Asians (f=6.11, p<0.01). Occupational activity level of N-H Asian participants was significantly lower than N-H African American and N-H White participants (table 3).

Construct validity; factor analysis

Table 4 indicates the results of factor analysis of the KPAS according to ethnicity. The Kaiser-Meyer-Olkin (KMO) Values indicated that the sampling for the ethnic groups were tolerable (KMO of Hispanics = .66, KMO of N-H Africans = .60, KMO of N-H Asians = .62, and KMO of N-H White =.69).

Among Hispanic participants, eight factors were extracted. All items of sports/exercise activity, and walking items of actual living habits showed high loadings on factor 1. The 4 items (preparing meals I and II, major cleaning and grocery shopping) of household/caring activity and walking/cycling transport items of the actual living habits had high loading on the second factor. Factor 3 included the 3 items (sitting, standing, and walking) of occupational activity and routine cleaning of household/caring activity. Factor 4 included the 3 items (lift heavy loads, sweating/exertion, and tired at end of day) of occupational activity. The 3 items (gardening, outdoor work, and home repair) of household/caring activity had high loading on the fifth factor. Childcare I and II were included in factor 6, comparative physical load of work and biking of actual living habits were included in factor 7, watching TV of Actual living habits and disabled childcare of household/caring activity were included in factor 8. These eight factors explained 67.93% of the total variance.

Among N-H African Americans, eight factors were extracted. All items of sports/exercise activity and walking items of the actual living habits showed high loadings on factor 1. The 6 items (comparative physical load of work, tired at end of day, sitting, walking, lift heavy loads and sweating/exertion) of occupational activity had high loadings on the second factor. Factor 3 included the 4 items (preparing meals I and II, major cleaning and routine cleaning) of household/caring activity. Factor 4 included the 3 items (gardening, outdoor work, and home repair) of household/caring activity and level of job. Childcare I and II were included

in factor 5, standing on the worksite and walking/cycling transport were included in factor 6, watching TV of actual living habits and grocery shopping of the household/caring activity were include in factor 7, and biking of actual living habits and disabled childcare were included in factor 8. These eight factors explained 66.66% of the total variance.

Among N-H Asian Americans, seven factors were extracted. All items of sports/exercise activity and walking items of the actual living habits showed high loadings on factor 1. The 5 items (sitting, standing, walking, lift heavy loads and sweating/exertion) of occupational activity had high loadings on the second factor. Factor 3 included the 5 items (preparing meals I and II, major and routine cleaning, and grocery shopping) of Household/caring activity. Outdoor work and home repair of household/caring activity were included in factor 4. Childcare and gardening of household/caring activity were included in the factor 5. Walking/cycling transport and watching TV of actual living habits and disabled childcare showed high loading in factor 6. Factor 7 included 2 items of occupational activity (comparative physical load of work, tired at end of day) and biking of actual living habits. These seven factors explained 67.62%.

Among N-H White participants, eight factors were extracted. All items of sports/exercise activity and walking items of actual living habits showed high loadings on factor 1. The 6 items (comparative physical load of work, sitting, standing, walking, lift heavy loads, and sweating /exertion) of occupational activity were included in factor 2. Factor 3 included 3 items (gardening, outdoor work, and home repair) of household/caring activity and level of job. These 3 items (preparing meals I and II, and grocery shopping) of household/caring activity had high loadings in the factor. Childcare I and II were included in factor 5. The 2 items (disabled childcare and major cleaning) of household/caring activity and biking of the actual living habits were included n factor 6. Eight factors explained 68.62% of the total variance.

Convergent validity; intercorrelation coefficients

Intercorrelation of subscales, with each other and with the total score, determined convergent validity (table 5). Among Hispanic participants, total KPAS score was correlated with all subscale scores, as evidenced by r values ranging from 0.41 to 0.83. In the subscales, household/caring activity was lowly correlated with occupational activity (r=0.30) and actual living habits (r=0.30). Actual living habits were moderately correlated with sports/exercise activity (r=0.57).

Among the N-H African American participants, the total KPAS had significant correlations with occupational activity (r=0.33), actual living habits (r=0.77), and sports/exercise activity (r=0.83). Sports/exercise activity had low negative correlation with household/caring activity (r= −0.25), however, there was a moderate positive correlation with actual living habits (r=0.51).

Among N-H Asian American participants, total KPAS was correlated with all subscales except occupational activity. Occupational activity showed low positive correlation with household/caring activity (r=0.34). Actual living habit was moderately correlated with sports/exercise activity (r=0.60).

N-H White participants showed the same tendency with the Hispanic participants. The r values between total KPAS and subscales ranged from 0.36 to 0.84. Household/caring activity was lowly correlated with occupational activity (r=0.39) and actual living habits (r=0.28). Actual living habits were moderately correlated with sports/exercise activity (r=0.54).

Discussion and Implication

This study evaluated the reliability and validity of the KPAS when used to assess PA among diverse ethnic midlife women. Results from these analyses showed that N-H African Americans were different from other ethnic groups in the internal consistency reliability test. A study on psychometric properties of physical instrument in African American (Oyeyemi, Adegoke, Oyeyemi, & Fatudimu, 2008) showed a cronbach's alpha below 0.70, especially among female participants. A possible reason for low reliability may be due to the common situation of many African American women. For instance, most work full-time, and many serve as caregivers to children, elderly parents, or grandchildren (Stolley et al., 2009) which may not be reflected on the instrument. Actually in this study, proportions of employed participants in N-H African Americans were higher than those in other ethnic groups. Proportions of divorced/separated women and single women were highest among N-H African Americans, which implicated a deficiency of family support.. Furthermore, a third of participants had three or five children. Another possible reason suggested by several studies on the trend seen among African Americans was that, those who are already 'on their feet' all day long may not perceive PA as a value (Airhihenbuwa, Kumanyika, Agurs, & Lowe, 1995; Tortolero, Masse, Fulton, & Kohl, 1997).

In the comparing the KPAS scores among diverse ethnic groups to estimate construct validity, Hispanic and N-H White showed a higher total KPAS score than N-H Africans and N-H Asians. This finding was different from results of previous studies, however, it was similar to results of previous studies using the KPAS. Several studies have reported the prevalence of inactivity was highest among Hispanic (Kruger et al., 2008; Marshall et al., 2007). Yet, these studies have focused on recreational activity regardless of other activity such as occupational or household activity. Omitting household, child care, and occupational activities from PA surveys may underestimate activity patterns among diverse ethnic women who do not participate in recreational activities during leisure time (Ainsworth et al., 2000; Masse et al., 1998). Sternfeld et al. (1999) who used the KPAS, reported that those of Hispanic ethnicity and with an educational standing of less than a college degree were more likelihood to be in the highest quartile of the household/caregiving index. They also found that women with the highest level of participation in sports/exercise activity were more likely to be younger, White, and college-educated. Actually in this study, Hispanic participants showed the highest scores in household/caregiving activity and actual living habits. In contrast, N-H Whites showed higher scores in occupational activity and sports/exercise activity. These results implicated the need for special regard to diverse activity domain such as housework and caregiving activity to assess the PA among multi-ethnic groups of midlife women.

In the comparing the KPAS scores among diverse ethnic groups, there was a statistically significant ethnic difference in the occupational activity (F=6.11, p<0.01). N-H Asians reported significantly lower scores compared with N-H Africans and N-H Whites. These finding may be caused by sociodemographic characteristics of participants. Proportions of employed participants among N-H Asians were lowest. Proportions of high-educated participants among N-H Asians were highest. Seventy-nine percent of N-H Asians reported their income levels as "not hard to meet basic needs." Also, N-H Asian participants may be more likely to be employed in an occupation that does not require severe PA or may be less likely to be employed because of their stable socioeconomic status (SES). There were important disparities in leisure-time PA by SES. People with higher SES were often more physically active than those with lower SES (Kamphuis et al., 2009; CDC, 2005a; CDC, 2005b; Giles-Corti, Donovan, 2002; Droomers, Schrijvers, & Mackenbach, 2001; Sternfield et al., 1999; Baecke et al., 1982). Actually in this study, N-H Asians showed the highest scores in sports/exercise activity.

The results of the factor analysis showed ethnic differences. Eight factors were extracted among all ethnic groups except N-H Asians. The reason why N-H Asians showed a different pattern might be explained by the 'segmentation hypothesis.'(Rain, Lane, and Steiner, 1991) Namely, N-H Asians may be more likely to compartmentalize their lives, making work and non-work separate. In this study, all items of occupational activity extracted the same factor among N-H Asians. However, there was a bonding of occupational activity items and items of actual living habits among other ethnic groups. For example, 'walking activity at worksite' and 'walking in daily routine' showed a high loading factor.

In the convergent validity test, N-H Africans and N-H Asians showed particular patterns. In the N-H Asian group, occupational activity did not converge into total PA. Also, in the N-H African group, household/caring activity did not. These findings were possibly explained, as stated above, by sociodemographic characteristics such as low employment rate among N-H Asians and high proportion of divorced/separated women among N-H Africans, and by attitude differences on PA.

Overall, the KPAS was a reliable instrument and was reasonably accurate in assessing PA for multi-ethnic groups of midlife women. However, cultural sensitivity among N-H African Americans and N-H Asian Americans need to be further examined.

Based on these findings, we suggest the following recommendations for future research. First, further studies should compare the KPAS with other existing instruments in diverse ethnic women. This would provide further evaluation of the ability of the KPAS to assess PA among multi-ethnic groups of midlife women. Second, more in-depth qualitative studies are needed for exploring the difference in patterns of PA, especially among N-H African and N-H Asian women. Also, analytical studies of the relationships between domain-specific activity and ethnicity of women need to be conducted. These additional efforts would lead to an improvement in cultural sensitivity of PA measurement. Finally, future research needs to be conducted with a larger number of multi-ethnic groups of midlife women.

Acknowledgments

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APPENDIX

1. Caring for a child (children) under 2 years of age

2. Caring for a child (children) between 2 and 5 years of age

3. Caring for a disabled child (children) or elderly person(s)

4. Preparing meals or cleaning up from meals on weekdays

5. Preparing meals or cleaning up from meals on weekends

6. Frequency of major cleaning

7. Frequency of routine cleaning

8. Going grocery shopping

9. Doing gardening or yard work

10. Doing heavy outdoor work

11. Doing major home decoration or repair Level) Level of job

12. In comparison with others my own age, physical level loads of my work

13. After work, degree of physical tiredness

14. Frequency of sitting on worksite

15. Frequency of standing on worksite

16. Frequency of walking on worksite

17. Frequency of lifting heavy loads on worksite

18. Sweating from exertion

19. Walking and bicycling to and from work (school) in daily routine

20. Watching TV in daily routine

21. Walking in daily routine

22. Biking in daily routine

23. In comparison with others my own age, degree of recreational physical activity

24. Frequency of playing sports or exercising

25. Sweating from exertion during sports or exercise

   SS) Simple Sports (SS) value

Table 1

Sociodemographic characteristics

Characteristics	Hispanic (total=96) n (%)	NH AA (total=79) n (%)	NH Asian (total=62) n (%)	NH White (total=104) n (%)	Total (total=341) n (%)
Age (Mean ± SD)	48.35±5.20	49.70±5.93	47.73±6.20	50.41±5.73	49.18±5.80
Education					
Middle school	2 (2.1)	0 (0.0)	0 (0.0)	0 (0.0)	2 (0.6)
High school	7 (7.3)	3 (3.8)	1 (1.6)	8 (7.7)	19 (5.6)
Partial college	35 (36.5)	17 (21.5)	6 (9.7)	22 (21.2)	80 (23.5)
College	21 (21.9)	26 (32.9)	14 (22.6)	34 (32.7)	95 (27.9)
Graduate degree	31 (32.3)	33 (41.8)	41 (66.1)	40 (38.5)	145 (42.5)
Religion					
Protestant	18 (18.8)	49 (62.0)	9 (14.5)	42 (40.4)	118 (34.6)
Catholic	61 (63.5)	13 (16.5)	12 (19.4)	16 (15.4)	102 (29.9)
Buddhist	1 (1.0)	0 (0.0)	8 (12.9)	1 (1.0)	10 (2.9)
Muslim	0 (0.0)	0 (0.0)	1 (1.6)	0 (0.0)	1 (0.3)
No religion	7 (7.3)	10 (12.7)	27 (43.6)	24 (23.1)	68 (19.9)
Others	9 (9.4)	7 (8.9)	5 (8.1)	21 (20.2)	42 (12.3)
Marital status					
Married	51 (53.1)	34 (43.0)	42 (67.7)	67 (64.4)	194 (56.9)
Partnered	12 (12.5)	6 (7.6)	4 (6.5)	11 (10.6)	33 (9.7)
Divorced/separated	21 (21.9)	23 (29.1)	10 (16.1)	16 (15.4)	70 (20.5)
Widowed	3 (3.1)	2 (2.5)	0 (0.0)	1 (1.0)	6 (1.8)
Single	9 (9.4)	14 (17.7)	6 (9.7)	9 (8.7)	38 (11.1)
Employment					
Yes	85 (88.5)	72 (91.1)	47 (75.8)	85 (81.7)	289 (84.8)
No	11 (11.5)	7 (8.9)	15 (24.2)	19 (18.3)	52 (15.3)
Income level					
Very hard	4 (4.2)	1 (1.3)	2 (3.2)	6 (5.8)	13 (3.8)
Somewhat hard	45 (46.9)	29 (36.7)	11 (17.7)	49 (47.1)	134 (39.3)
Not hard	47 (49.0)	49 (62.0)	49 (79.0)	49 (47.1)	194 (56.9)

Characteristics	Hispanic (total=96) n (%)	NH AA (total=79) n (%)	NH Asian (total=62) n (%)	NH White (total=104) n (%)	Total (total=341) n (%)
Country of birth					
U.S.	68 (70.8)	75 (94.9)	20 (32.3)	101 (97.1)	264 (77.4)
Outside U.S.	28 (29.2)	4 (5.1)	42 (67.7)	3 (2.9)	77 (22.6)
BMI(kg/m²) (Mean±SD)	31.16±7.04	30.07±6.16	23.31±3.54	28.53±7.01	28.68±6.87
Menopausal status					
Premenopause	32 (33.3)	27 (34.2)	22 (35.5)	30 (28.9)	111 (32.6)
Early perimenopause	19 (19.8)	10 (12.7)	15 (24.2)	14 (13.5)	58 (17.0)
Late perimenopause	3 (3.1)	5 (6.3)	2 (3.2)	2 (1.9)	12 (3.5)
Postmenopause	26 (27.1)	21 (26.6)	21 (33.9)	40 (38.5)	108 (31.7)
Surgical menopause	16 (16.7)	16 (20.3)	2 (3.2)	18 (17.3)	52 (15.3)

Table 2

Internal consistency reliability of the KPAS according to ethnicity

	Hispanic (Cronbach's alpha)	N-H African (Cronbach's alpha)	N-H Asian (Cronbach's alpha)	N-H White (Cronbach's alpha)
Total score (TPhy)	0.80	0.66	0.72	0.80
Household/caring activity (House A)	0.73	0.70	0.71	0.70
Occupational activity (Occup A)	0.79	0.78	0.81	0.79
Actual living habits (Living A)	0.49	0.55	0.37	0.46
Sports/exercise activity (Sport A)	0.87	0.82	0.85	0.87

Table 3

Mean of the KPAS according to ethnicity

	Hispanic (Mean±SD)	N-H African (Mean±SD)	N-H Asian (Mean±SD)	N-H White (Mean±SD)	F (p)
Total score (TPhy)	10.21±2.15	9.82±1.79	9.82±1.80	10.14±2.07	0.87 (0.459)
Household/caring activity (House A)	2.32±0.54	2.18±0.47	2.25±0.49	2.26±0.47	1.25 (0.293)
Occupational activity (Occup A)	2.23±0.54	2.34±0.53[b]	2.04±0.56[a b]	2.40±0.55[a]	6.11 (0.001)
Actual living habits (Living A)	2.81±0.80	2.56±0.83	2.64±0.71	2.61±0.80	1.70 (0.167)
Sports/exercise activity (Sport A)	2.84±1.24	2.75±1.14	2.89±1.16	2.87±1.21	0.22 (0.885)

[a, b] p<.05 result of Tukey's Honestly Significant Differences (HSD) test

Table 4

Items contributing to factor loading of the KPAS

	Hispanic			N-H African American			N-H Asian			N-H White		
	Item	Factor loading	% of variance	Item	Factor loading	% of variance	Item	Factor loading	% of variance	Item	Factor loading	% of variance
Factor 1	SS value	0.70	19.17	SS value	0.81	15.65	SS value	0.80	18.07	SS value	0.79	19.82
	23	0.81		23	0.78		23	0.77		23	0.74	
	24	0.86		24	0.76		24	0.88		24	0.90	
	25	0.88		25	0.83		25	0.86		25	0.91	
	21	0.56		21	0.54		21	0.69		21	0.61	
Factor 2	12	0.82	13.43	12	0.66	13.33	14	0.73	14.40	12	0.56	13.55
	13	0.83		13	0.58		15	0.80		14	0.73	
	14	0.65		14	0.64		16	0.87		15	0.85	
	16	0.35		16	0.54		17	0.62		16	0.81	
	19	0.61		17	0.79		18	0.67		17	0.55	
				18	0.88					18	0.56	
Factor 3	7	0.47	9.73	4	0.75	10.31	4	0.84	9.60	Level	0.65	8.90
	14	0.61		5	0.77		5	0.82		9	0.54	
	15	0.79		6	0.48		6	0.49		10	0.77	
	16	0.81		7	0.67		7	0.64		11	0.71	
							8	0.77				
Factor 4	13	0.53	7.15	Level	0.69	7.38	10	0.78	8.68	4	0.75	7.01
	17	0.79		9	0.64		11	0.75		5	0.74	
	18	0.74		10	0.69					8	0.73	
				11	0.57							
Factor 5	9	0.83	5.70	1	0.84	5.81	1	0.76	6.45	1	0.83	5.83
	10	0.88		2	0.81		2	0.76		2	0.75	
	11	0.68					9	−0.49				
Factor 6	1	0.72	4.45	3	0.59	5.03	3	−0.40	5.89	3	0.38	5.17
	2	0.76		19	0.66		19	−0.57		6	0.58	

	Hispanic			N-H African American			N-H Asian			N-H White		
	Item	Factor loading	% of variance	Item	Factor loading	% of variance	Item	Factor loading	% of variance	Item	Factor loading	% of variance
Factor 7	12	−0.40	4.36	8	−0.55	4.93	20	0.76		22	0.58	4.33
	22	0.71		20	0.79		12	0.63	4.53	7	−0.39	
							13	0.47		19	0.75	
							22	−0.49				
Factor 8	3	0.58	3.95	3	0.79	4.23	13		3.69	13	−0.56	4.01
	20	0.80		22	0.55		20			20	0.84	

*
see the Appendix for the items

Table 5

Intercorrelations of the KPAS according to ethnicity

Hispanic

	TPhy	House A	Occup A	Living A	Sports A
TPhy	1.00				
House A	0.48*	1.00			
Occup A	0.41*	0.30*	1.00		
Living A	0.80*	0.30*	0.09	1.00	
Sports A	0.83*	0.09	0.08	0.57*	1.00

N-H African American

	TPhy	House A	Occup A	Living A	Sports A
TPhy	1.00				
House A	0.08	1.00			
Occup A	0.33*	-0.01	1.00		
Living A	0.77*	-0.03	-0.01	1.00	
Sports A	0.83*	-0.25*	0.07	0.51*	1.00

N-H Asian American

	TPhy	House A	Occup A	Living A	Sports A
TPhy	1.00				
House A	0.36*	1.00			
Occup A	0.24	0.34*	1.00		
Living A	0.77*	0.10	-0.12	1.00	
Sports A	0.80*	-0.09	-0.19	0.60*	1.00

N-H White

	TPhy	House A	Occup A	Living A	Sports A
TPhy	1.00				
House A	0.53*	1.00			
Occup A	0.36*	0.39*	1.00		
Living A	0.75*	0.28*	-0.04	1.00	
Sports A	0.84*	0.17	0.04	0.54*	1.00

*
$p < 0.05$