

✧ RESEARCH PAPER ✧

# *Caring for women globally: Psychometric testing of two instruments translated into five languages for use in cardiovascular recovery*

**Lucia Gonzales RN NP-C MBA PhD**

*Associate Professor, University of San Diego, San Diego, California, USA*

**Anne Koci PhD RN FNP-BC WHNP**

*Professor, Texas Woman's University, Houston, Texas, USA*

**Rose Mary Gee RN PhD**

*Assistant Professor, Georgia Southern University, Statesboro, Georgia, USA*

**Ariko Noji RN PhD**

*Professor, Chiba University, Chiba, Japan*

**Dale Glaser PhD**

*Statistician, Glaser Consulting, San Diego, California, USA*

**Allison K Marsh MPH**

*Social Worker, Harlem Children's Zone, New York, New York, USA*

**Kathy K Marsh PhD RN**

*Associate Professor, University of San Diego, San Diego, California, USA*

**Amara Michella Altman MSN RN**

*Alumna, University of San Diego, San Diego, California, USA*

**Nasser Al Salmi MSN**

*Educator, College of Nursing, Sultan Qaboos University, Muscat, Oman*

**Sulaiman Al Sabei MSN**

*PhD Student, Oregon Health and Science University, Portland, Oregon, USA*

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## Caring for women globally: Psychometric testing of two instruments translated into five languages for use in cardiovascular recovery

Among women, cardiovascular disease is the leading cause of mortality worldwide. After experiencing an acute cardiovascular event, a woman's physical health, the prevalence of morbidities, likelihood of being treated with coronary artery bypass graft surgery, likelihood for referral for cardiac rehabilitation are less favourable than men. The social support resources of marginality and religiousness are associated with physical and mental health outcomes following cardiovascular crises. This study aimed to evaluate the reliability and validity of the translated versions (Japanese, Ukrainian, Tagalog, Hispanic and Arabic) of the Koci Marginality Index and the Duke University Religion Index among 282 women (aged 35–92 years) representing seven cultures. Results showed that reliability and validity were strong (coefficient alpha of 0.79 and 0.84). Understanding a woman's social isolation and whether she has a connection to religious groups assists health-care professionals to identify a woman's social support resources during recovery following acute cardiovascular episodes.

**Key words:** cardiovascular disease, female, marginality, religion, social isolation, social support.

### INTRODUCTION

Noncommunicable diseases, such as cardiovascular disease (CV), cancers, chronic respiratory disease and diabetes, are responsible for 63% of mortality worldwide.<sup>1</sup> Globally 8.6 million women die each year from CV and stroke.<sup>2</sup> CV kills more women than all cancers, HIV/AIDs, tuberculosis and malaria combined.<sup>3</sup> CV accounts for 32% of deaths in women worldwide, 5% more than in men.<sup>4</sup> CV is the leading cause of death in women in every major developed country and in most emerging economies.<sup>5</sup> Approximately 81% of all CV deaths among women occur in low- and middle-income countries.<sup>6</sup> Current research indicates the need for sound practices, for example elements of the screening process to identify a woman's needed resources in recovery from a CV event such as myocardial infarction or a coronary artery bypass graft surgery.<sup>7,8</sup> At one month following acute myocardial infarction, women are less likely to participate in cardiac rehabilitation.<sup>9</sup> Women are less likely to undergo coronary artery bypass graft surgery and when they do, they have a higher prevalence for all comorbidities with the exception of cancer.<sup>10</sup> At six months following coronary artery bypass surgery the physical component summary score of health-related quality of life has been reported to be less favourable than male counterparts.<sup>11</sup>

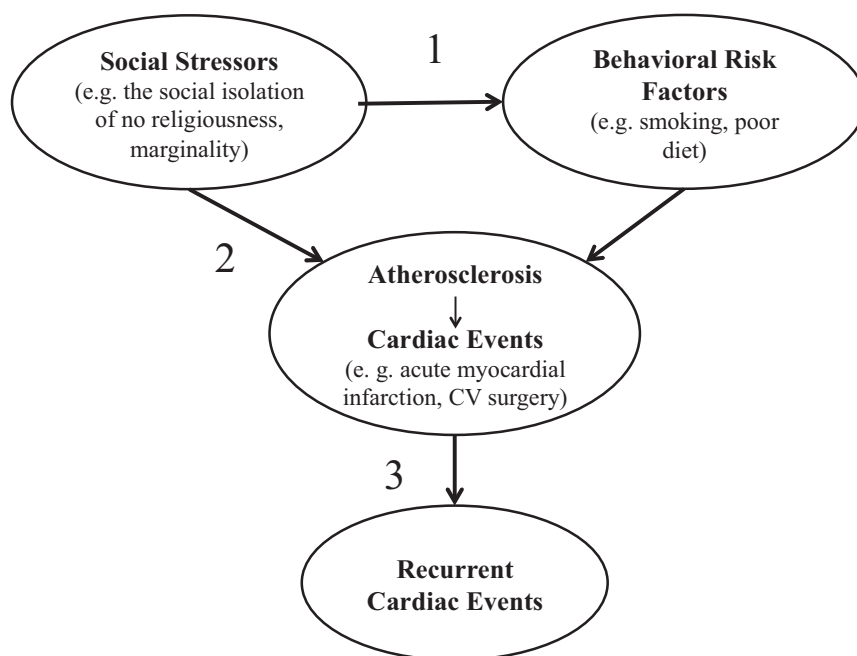
### Background/significance

Global action plans of The World Health Organization and the American Heart Association contain goals to

empower women, improve women's health and develop global partnerships.<sup>12,13</sup> This study is in alignment with these goals, and its investigators partner with nurse leaders globally to share assessment instruments designed to evaluate the woman as she recovers from a CV event. Two established instruments, the Koci Marginality Index (KMI) and Duke University Religion Index (DUREL), developed in 2004 and 1997 respectively, were selected to share with global research and clinical colleagues. These instruments can assist in evaluating a women's access to social and religious support resources during CV event recovery. These instruments had reported reliability and validity indices in diverse populations from the United States. To enhance their global usage these established assessment instruments were translated into Japanese, Ukrainian, Tagalog, Spanish and Arabic.

### Conceptual model

The selection of instruments was guided by a schema initially developed by Rozanski *et al.* that conceptually depicts psychosocial stressors and the influence of behavioural risk factors on the pathogenesis of atherosclerosis and the occurrence of CV events. In examining the incidence of CV in 15 studies, an individual who engages in small networks has been associated with two- to threefold increase in CV.<sup>14</sup> Psychosocial stressors lead to the development of CV in three basic ways (Fig. 1): (1) they directly promote atherosclerosis; (2) they contribute to



**Figure 1.** Conceptual model: Psychosocial stressors lead to the development of CV in three basic ways: (1) they directly promote atherosclerosis; (2) they contribute to unhealthy lifestyle behaviours; and (3) after the development of CV, stressors form a barrier to successful modification of the unhealthy lifestyle behaviour (Adapted from Rozanski *et al.*,<sup>14</sup> with permission).

maintenance of unhealthy lifestyle behaviours such as smoking and poor diet; and (3) after the development of CV, the psychosocial stressors form a barrier to successful modification of the unhealthy lifestyle behaviour. This study focused on instruments that could assess the psychosocial stressor of social isolation (e.g. marginality and religiousness).

Marginality, the distance from the centre of decision-making, was selected as a social stressor indicator. The concept of marginality describes the social margins that bring about social isolation as well as the psychological isolation of individuals. Both facets of isolation have been linked to physical and mental health.<sup>15</sup> Using a life course conceptual model, Plach studied women in recovery from heart surgery and reported that the psychological well-being can be affected resulting in depression.<sup>16</sup> Studying heart failure, emotional distress due to fatigue can result in worsened health and increased health care utilization.<sup>17</sup>

Religiousness was selected as another social stressor indicator. By definition, being religious, as opposed to being spiritual, relates to an organizational participatory activity and indicates potential resources of social support from a religious congregation. The religion–health relationship has been linked in over 2000 studies in the past 10 years.<sup>18</sup> Hybels and colleagues have reported that markers indicating signs of atherosclerosis, such as inflammation of

the vascular endothelium and coagulation, were lower with more frequent religious attendance.<sup>19</sup>

## Purpose

The purpose of this study was to examine the reliability and validity of the translated versions of the KMI and DUREL into Japanese, Ukrainian, Tagalog, Spanish and Arabic. The ultimate goal was to prepare assessments that could be used by global colleagues to determine a woman's available resources in achieving positive health outcomes following a CV event. Examples of CV events are acute myocardial infarction, coronary artery bypass surgery or a diagnosis of heart failure. Using a social stressor model as a guide, investigators focused upon marginality and religiousness that have been associated in the literature with physical and psychological health in CV events.

## Research questions

The research questions for this study were as follows:

1. What were the reliability indices of the KMI and DUREL instruments?
2. Do the KMI and DUREL demonstrate convergent and discriminant validity?
3. Are there associations between marginality, religiousness, education and annual household income?
4. What were the validity indices for the KMI and DUREL instruments using confirmatory factor analyses?

## Review of the literature

Marginality adversely impacts physical and psychological health in women.<sup>20</sup> Using the psychobiological model of CV, it is suggested that psychological factors of depression and anxiety contribute to CV development and progression in patients with heart failure.<sup>21,22</sup> Studies of marginalized indigenous populations in the United States, Canada and Australia provide strong evidence of relationships between influence within society, psychosocial factors and CV.<sup>23</sup> Marginalized individuals within a population were more than twice as likely to report CV as non-marginalized counterparts.<sup>24</sup> In rehabilitation, women with an acute coronary event of coronary artery bypass surgery report feeling alone or isolated in the experience.<sup>25</sup>

Religiousness in women following an acute myocardial infarction is significantly associated with mental health and well-being.<sup>26,27</sup> Religious attendance is associated with reduction in blood pressure and mortality and shorter lengths of stay following CV surgery.<sup>28–30</sup> Systematic reviews demonstrate findings that participation in religious activities and social relations contribute in the reduction of mortality from CV.<sup>31</sup> In patients undergoing heart surgery, low religiousness was a predictor of psychological vulnerability and greater length of stay.<sup>32</sup> In the rehabilitation setting, religious practices were associated with better mental health.<sup>33</sup> The attending of religious meetings item has been inversely associated with depression, health use and mortality. Attendance has been positively associated with social support and physical health.<sup>34</sup>

The strong psychometric properties of the KMI and the DUREL have been acknowledged in the literature. The KMI in 2004 had a reported reliability with its 70-item version as 0.96  $n = 568$  and in 2012 with its five-item version as 0.84  $n = 300$ .<sup>15,35</sup> The DUREL had a reported reliability of 0.758  $n = 383$  and Cronbach's alphas of 0.79–0.91.<sup>36</sup> The DUREL has been translated into 11 languages previously (Spanish, Portuguese, Chinese, Romanian, Japanese, Thai, Persian, German, Norwegian, Dutch and Danish).<sup>36</sup> This study adds the translations of Ukrainian, Tagalog and Arabic to the DUREL. The KMI previously had no translations.

## METHODS

The study was performed in a multi-centre, multicultural context. Concurrent pilot studies of no fewer than 20

participants were conducted. Translated instruments were administered to native-born women of Japanese, Ukrainian, Philippine, Hispanic, American, Omani and Haitian cultures. A woman's culture, for the purposes of this study, was identified according to their place of birth. The Philippine or Hispanic women were born in the Philippines or other Hispanic nations, respectively. These women are immigrants residing in the United States, and may carry American citizenship, but for the purposes of this translated instruments study, the cultural nomenclature was defined by their birthplace. In addition each participant was asked what race they considered themselves. Administering the instruments across cultures demonstrates the instruments' applicability for global use. The protocol was approved by the Institutional Review Board (IRB) of the university of the principal investigator. All study personnel had certified research ethics education. All participants gave informed consent in the language of their birthplace. Participant confidentiality was preserved. Responses were separated from consents and assigned an identification code. When the online survey system was the vehicle used, solely the principal investigator accessed the database that contained the participant's name. Data analysis and interpretation were performed with the identification code without name.

## Participant selection

The inclusion criterion was women who were 35 years of age and above. This age group was selected to represent the midlife and older women. Excluded from the protocol were those unable to read written language or hear spoken translations, men, and women below the age of 35. Lack of access to computers was not an exclusion criterion as translated paper instruments, consents and announcements were available. In the US and Japanese samples, that were recruited by email, the researchers also provided the alternative of using a paper instrument. Some requests to use paper instruments were made and utilized by Japanese participants.

## Sampling plan

A cross-sectional study design was used. Initially, sample size projections were set at 25 for each cultural group and later targets were increased to 50, where possible, at the request of the statistician as increased sample size supports the confirmatory factor analyses. Participants were approached through snowball technique, the Internet,

**Table 1** Sample plan

Language	Location	Setting	Sampling	Survey type	Participation incentive	<i>n</i>
Japanese	Chiba, Japan	University	Snowball	Electronic; paper	\$25	53
Ukrainian	Kiev, Ukraine	Church medical mission	Convenience	Paper	\$125 Donation to church	21
Tagalog	Los Angeles; San Diego, CA	Private home, workplace	Convenience snowball	Electronic; paper	\$25 for focus group; \$5 for survey solely	36
Spanish	San Diego, CA	Private home, workplace	Convenience	Paper	\$5	30
Arabic	Nizwa; Sowa, Oman	Private home	Convenience snowball	Paper	None	20
Fr. Creole	Milot, Haiti	Hospital mission	Convenience	Verbal translation	\$2	55
English	United States	Internet	Snowball	Electronic	None	67

email announcement with access to electronic survey website, colleagues at the workplace, relatives, or while investigators were conducting medical missions in other countries. Table 1 provides details about recruitment sites and other specifics. The study was explained by email announcement or in person. Those reading or hearing about the announcement self-selected and volunteered to participate in the study. Consent was then formally obtained. Informed consent was read by the participant, or there was a verbal explanation made in the translated language. Haitian women were recruited in person and consented after being read the consent translated into their native language of French Creole by an interpreter. This procedure is required because French Creole is only a spoken, not written, language. Decisions regarding the appropriate participation incentives were set according to cultural norms and paid in local currency except in Haiti where there was a preference for the American dollar with its increased buying power in that culture. Payments ranged from nothing to the equivalent of twenty-five U.S. dollars (Table 1).

### Instruments

The translation effort followed an established process that included a native translator who translated the instrument, a second bilingual translator back translating and a review by additional translators with knowledge of the goals of the intended instruments.<sup>37</sup> Differences were settled by using as a guide the standard language that would be used in a television or radio broadcast. The last step of the translation procedure in creating the final version was the pre-testing of the instrument among female native speakers aged 35 or older.

The KMI consisted of five items; each scored on a five-point Likert scale and calculated as the sum of the

items, except with one reverse scored (Item 4). The overall score range is from 5 to 25. The scale typically takes less than 1 min to complete. In the history of its development this index was shortened from an original 70-item survey using factor analysis.

The DUREL measure of religiousness was developed by Harold Koenig.<sup>36</sup> The instrument consists of five items. It is a composite of three subscales: religious meetings (1 item), religious activities like prayer (1 item) and religious belief regarding experiences (3 items). Each item is scored with either a five- or six-point Likert scale yielding an overall score range from 5 to 6 for each item. A participant typically spends less than 1 min completing the scale. The three subscales may be examined individually.

The Index of Religiousness was administered with the DUREL to provide evidence in the examination of convergent validity.<sup>38</sup> The Index of Religiousness contains three items assessing frequency of attendance at religious groups, perceived religiousness and the degree to which religion is a strength and comfort. Each item is scored with either a five- or six-point Likert scale yielding an overall score range from 3 to 16. A participant typically spends less than 1 min completing the scale. A higher score reflects greater religiousness. The Index of Religiousness demonstrated acceptable reliability in a sample of midlife women following acute myocardial infarction ( $n = 59$ ) and with elder women following hip surgery ( $n = 30$ ).<sup>26,39</sup>

In addition to the instruments, a nine-item demographic form (e.g. age, education, income, marital and living with status, and race) was used to gather information from participants. Annual household income was recorded in dollar amount or native country currency. Time of completion for the demographic form was typically 3 min. The completion of both instruments, including the demographic data sheet, took an average of 5 min.

## Data collection

Prior to the recruitment and data collection, the data collection team members reviewed the parameters of this study: the significance, background, conceptual model, inclusion/exclusion criteria, announcement and informed consent process, and instrument administration. Instruments were completed either online using survey software or in person by paper and pencil survey. Missing data for item nonresponses were addressed using the imputation method.<sup>40</sup> A four-page IRB document was the first question asked, and a field was provided for entering a name if the participant consented to participate. The digital surveys were developed with the feature that blocked the advancement to the next item without item completion. This feature facilitated item completion with no missing data.

## Data analysis

Data analysis was accomplished through the use of SPSS (International Business Machines Corporation., Armonk, NY, USA) statistical software version 21 and the Mplus Version 7.11 (Muthén & Muthén, Los Angeles, CA, USA). Alpha was set at  $P < 0.05$  for all statistical tests. Initial data analysis included running descriptive statistics on sample characteristics, examining for type and extent of any missing data and assessing psychometric properties of all instrument subscales and full scale. Prior to analysis, data were assessed for outliers and checks were made for violations of normality and/or linearity. Internal consistency was performed in the analysis. Pearson  $r$  correlations were computed for the scales (including household income). To assess the relative socioeconomic status of the participant in relation to the reported median income of their country in which they were living, data were also analyzed by computing a variable for the participant that gave a ranking of low, medium and high in relation to the reported median income. A low income ranking was awarded if the participant's income was 60% of the median income or less. A medium income ranking was awarded if the income was 61% to 139% of the median income. A high income ranking was awarded if the income was 140% of the median income. The median income by country used was calculated as follows: (gross domestic product divided by midyear population for countries surveyed) converted to US dollars; these values were labelled as 'nationalized household income' reported in Table 2.

Since it is assumed that the KMI and DUREL were measuring distinct constructs, evidence of discriminant validity would be manifest if the correlations between the

instruments were relatively low (e.g.  $r \leq 0.3$ ). Since it is assumed that the DUREL and the other instrument of religiousness, the Index of Religiousness, were measuring the same concept, convergent validity would be manifest if the correlations between the instruments were high (e.g.  $r \geq 0.7$ ).

Besides the KMI, there are no other existing tests of marginality that measure the same concept in order to provide evidence for its convergent validity. A confirmatory factor analysis (CFA) was performed. By examining and testing the relationship between the manifest indicators (i.e. individual items) and the latent constructs, evidence can be furnished as to the psychometric integrity of the instrument.<sup>44</sup> For the purpose of this investigation, separate analyses will be conducted for marginality and religiousness. Though cut-offs have been suggested, a more conservative approach was used with this initial psychometric assessment insofar comparative fit index (CFI) and Tucker–Lewis index (TLI)  $> 0.95$ , Standardized Root Mean Square Residual (SRMR)  $< 0.05$  and Root Mean Square Error of Approximation (RMSEA)  $< 0.08$  will be preliminary evidence of acceptable fit.<sup>45</sup> The robust likelihood estimator, the maximum likelihood robust (MLR), was reported.<sup>46</sup>

## RESULTS

The full sample consisted of 282 women over the age of 35. Anticipated sample size was met with the Japanese, US and Haitian groups. Sample size of less than 50 included the groups of Ukrainian, Philippine and Hispanic US and Arabic women. Table 3 reflects the demographics of the sample. The majority of women were ages 35 to 65. Their race was white (45%) followed by Asian (33%), black (19.5%). Thirty per cent had a high school education and an annual family income less than the equivalent of \$20 000.

Coefficient alpha was computed for each of the instruments using data from all subject groups: KMI 0.77 with a mean score of 11.17 (SD = 3.79); DUREL 0.84 with a frequency for religious meeting attendance of 'never' of 17.7%, 'once a year or less' of 9.9% a 'few times a year' of 19.1%, a 'few times a month' of 8.5%, 'once a week' of 24.5% and 'more than once a week' of 18.1%. Time spent in religious activities was 'rarely or never' of 27%, a 'few times a month' of 9.6%, 'once a week' of 4.6%, 'two or more times a week' of 8.2%, 'daily' of 25.5% and more than once a day of 23.8%. A mean score of religious beliefs regarding experiences (three items) of a mean score of Item

**Table 2** By country, percentage of religious practice, DUREL, median income, KMI, and nationalized annual household income (GDP/midyear population in dollars by country)

Country	Relig. practice (%)	DUREL <i>n</i> Mean (SD) (% of max score of 27)	Median income	KMI <i>n</i> Mean (SD) (% of max score of 25)	Nationalized annual household income <i>n</i> % Low % Mid % High
Japan <sup>41,42</sup>	30	<i>n</i> = 53 11.30 (4.33) 42	\$39 473	<i>n</i> = 53 12.36 (3.44) 49	<i>n</i> = 53 7.5 11.3 81.1
Ukraine <sup>41,42</sup>	57	<i>n</i> = 18 18.5 (3.83) 69	\$2545	<i>n</i> = 16 10.69 (3.34) 43	<i>n</i> = 14 42.9 23.8 33.3
Oman <sup>41,42</sup>	99	<i>n</i> = 20 23.2 (1.32) 86	\$18 114	<i>n</i> = 20 11.6 (2.87) 46	<i>n</i> = 20 0 15.0 85.0
Haiti <sup>42,43</sup>	80	<i>n</i> = 55 23.5 (2.46) 87	\$820	<i>n</i> = 25 10.64 (3.45) 43	<i>n</i> = 55 0 83.6 16.4
United States— American <sup>42,43</sup>	76 <sup>†</sup>	<i>n</i> = 67 21.6 (5.45) 80	\$46 999 <sup>†</sup>	<i>n</i> = 67 11.24 (4.42) 45	<i>n</i> = 67 4.5 34.4 61.2
United States—Philippine Immigrant <sup>42,43</sup>	76 <sup>†</sup>	<i>n</i> = 36 21.2 (3.55) 76	\$46 999 <sup>†</sup>	<i>n</i> = 36 10.17 (3.35) 41	<i>n</i> = 36 11.1 38.9 50
United States—Hispanic Immigrant <sup>42,43</sup>	76 <sup>†</sup>	<i>n</i> = 30 19.1 (6.14) 71	\$46 999 <sup>†</sup>	<i>n</i> = 30 10.37 (4.06) 42	<i>n</i> = 28 40 26.7 33.3

<sup>†</sup> U.S. data reported here includes immigrant groups.

3 of 4.31 (SD = 1.17), Item 4 of 3.99 (SD = 1.34), and Item 5 of 3.91 (SD = 1.36). Demonstrating discriminant validity, Pearson correlations between the KMI and DUREL were low ( $r \leq 0.3$ ) ( $r = -0.05$ ,  $P = 0.452$ ). Regarding convergent validity, Pearson correlations between the DUREL and the Index of Religiousness ( $n = 248$ ) were high ( $r = 0.91$   $P = 0.01$ ).

Further analysis to examine convergent and discriminant validity demonstrated no associations between marginality and religiousness. However these two variables were not associated with education completed by the participant, annual household income or age. However, significant associations were found between religiousness, education completed by the

**Table 3** Population description  $n = 282$ 

Demographic factors	Frequency	%
Age range 35–45 ( $n = 246$ )	92	32.6
Age range 46–55	85	30.1
Age range 56–65	42	14.9
Age range 66–75	23	8.2
Age range 76–85	2	0.7
Age range 86–95	2	0.7
Ethnicity-Hispanic	35	12.4
Ethnicity-non-Hispanic	227	80.5
Race black	55	19.5
Race white	127	45
Race Asian	93	33
More than one race	7	2.1
Years of education 1st–9th grade	49	17.4
Years of education 10-high school graduation	35	12.4
College educated	146	51.8
Graduate degree	52	18.4
Lives alone	35	12.4
Lives with spouse	138	47.3
Household annual income equivalent < \$20 000 ( $n = 273$ )	80	29.3

participant, nationalized annual household income and age (Table 4).

To examine validity, confirmatory factor analyses were tested using the MLR estimator. For the KMI ( $n = 247$ ), the significant chi-square test indicates that the model does not fit the data: ( $\chi^2(5) = 4.64$ ,  $P < 0.46$ ). The RMSEA was 0.000, TLI = 1.004, CFI = 1.000 and the Standardized Root Mean Residual (SRMR) = 0.024. Likewise, the same testing for the DUREL ( $n = 278$ ) showed a significant chi-square test result that indicates that the model does not fit the data: ( $\chi^2(5) = 4.67$ ,  $P < 0.12$ ). The RMSEA was 0.005, TLI = 0.977, CFI = 0.989 and the SRMR = 0.019.

## DISCUSSION

The findings from the KMI and DUREL instruments compare favourably with findings reported in the literature. For example, in a sample of abused women ( $n = 300$ ) who reached out for help by either going to a shelter or accessing the district attorney for a protection order, the KMI yielded an  $\alpha = 0.84$  whereas the current study yielded an  $\alpha = 0.79$ . Likewise, the mean KMI score for our sample is mid-range (Mean = 11.17,

SD = 3.79) while the abused women illustrated more marginality. That is women going to a shelter (Mean = 14.03, SD = 5.58) or accessing the district attorney for a protection order (Mean = 12.72, SD = 5.16) had higher scores. This is a problem for women because individuals with high scores for marginality become isolated from others, more prone to stress, anxiety and depression, which would put them at higher risk for CV.

The religiousness score was similar though slightly lower to findings reported in the National Institute of Mental Health's Epidemiologic Catchment Area survey of a random sample of persons ( $n = 2962$ ) aged 18 to 90 of community-dwelling adults conducted in central North Carolina. In that study, religious meetings with a frequency of 'once a week' was 28.9% compared with our study of 24.5%, time spent in religious activities of a daily frequency was 39.1% compared with our study of 25.5%. The means for religious beliefs regarding experiences (three items) was 4.6 (SD = 1.0), 4.4 (SD = 1.1) and 4.3 (SD = 1.2) compared with our study of 4.31 (SD = 1.17), 3.99 (SD = 1.34) and 3.91 (SD = 1.36).<sup>36</sup>

The lack of association between the factors of marginality and religiousness reinforced the expected functioning of the instruments—that these instruments are not redundant or measure overlapping constructs. The discriminant validity is important because future work on assessing a woman's recovery from CV depends on identifying two distinct instruments that measure the social isolation indicators of marginality and religiousness. As expected, there was an association between DUREL and a parallel measure, the Index of Religiousness. This finding was an expected demonstration of convergent validity that this study was the first to report.

As expected, nationalized annual household income was associated with higher education. However, religion was significantly negatively associated with income and education. It is notable that three sample groups reported an inverse relationship between religiousness and income. As reported by others, Japanese subjects reported low religiousness and high incomes.<sup>41</sup> Ukrainian study participants reported high religiousness scores and had low to medium incomes. Haitian study participants reported high religiousness scores and medium incomes. These associations may be a function of the reported population practicing religion data and the income statistics.

Regarding the confirmatory factor analyses, for the  $\chi^2$  test, a fail to reject decision is preferred (i.e.  $P > 0.05$ ).



**Table 4** Correlations among marginality, religiousness, education completed—participant, nationalized annual household income

	1	2	3	4
1. Marginality	1			
2. Religiousness	-0.09	1		
3. Education completed—participant	-0.02	-0.27**	1	
4. Nationalized annual household income	0.11	-0.20**	0.37**	1

\*\*  $P < 0.01$ .

The  $\chi^2$  test for KMI was  $P < 0.46$ ; for DUREL was  $P < 0.12$ . Evidence of acceptable fit is that the CFI and TLI  $> 0.95$ , SRMR  $< 0.05$  and RMSEA  $< 0.08$ . The KMI and the DUREL met all acceptable fit indices. The RMSEA for the KMI was 0.000 and for the DUREL was 0.005.

### Limitations of the study

When taken as a whole for psychometric analysis, the sample size of 282 is robust. However, when reporting individual findings for women, specific to the culture, sample sizes are inadequate. Sampling targets for each culture could be raised to 250 from 50. Future studies should focus on enriching the validation of the scales in each language.

### Conclusion

The purpose of the study was to test newly translated instruments for studies of CV disease recovery among women. Researchers using these instruments would be aligned with two key assumptions. One assumption is that a woman's illness is socially constructed.<sup>47</sup> Illness has social implications; is perceived differentially by the woman who has the support of a religious group and one who is at the margins of society. The second assumption is that in seeking understanding about women's health, research should be conducted in multiple cultures. Globally, we share common illnesses.

For clinicians, if marginality is scored low, this may be considered a strength for CV recovery. A high score on marginality may indicate a clinical concern related to social isolation, depression or abuse. Such clinical concerns are associated with negative CV outcomes. High religiousness would typically offer an opportunity to work within local religious organizations who advocate for health. For example, in the Muslim culture, the mosque

may be a good setting to teach both nutrition and self-care skills to older women. For researchers and clinicians alike, these reliable and valid instruments may be useful to assess a woman's personal resources and social support or lack thereof during an acute CV event.

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## DISCLOSURES

The authors declare no conflict of interest.

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