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ORIGINAL

Healthcare Mistreatment and Cultural Beliefs Impact HbA1c in Patients with Type 2 Diabetes Mellitus

La Negligencia Médica y las Creencias Culturales impactan BHA1C en Pacientes con Diabetes Mellitus tipo 2

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Abstract

The aim of this research was to examine the effects of healthcare mistreatment and cultural beliefs on psychological, behavioral, and biological phenomena relevant to treatment adherence and health outcome among patients with Type 2 Diabetes Mellitus (T2DM). The study was conducted in Chile, where the prevalence of T2DM is one of the highest in Latin America and is increasing at an accelerated rate. The research was guided by Betancourt's Integrative Model and bottom-up mixed-method cultural research approach. Consistent with the hypotheses of the study, the test of a structural equation model based on the Integrative Model, including exposure to healthcare mistreatment, diabetes-related cultural beliefs, psychological distress, and medical avoidance as determinants of HbA1c, a biological measure of diabetes control, fit the data. The fact that the analysis of structural equations accounted for significant variance in HbA1c provides supporting evidence for extending the Integrative Model, to explain biological phenomena based on cultural and psychological factors.

Keywords: Healthcare, Culture, Diabetes, Beliefs, Integrative Model

Resumen

El propósito de este trabajo fue evaluar los efectos de la negligencia médica y las creencias culturales sobre fenómenos biológicos, conductuales y psicológicos relevantes para la adherencia al tratamiento y consecuencias de salud en pacientes con diabetes mellitus tipo 2 (DMT2). El estudio se llevó a cabo en Chile, donde la prevalencia de DMT2 es una de las más altas de América Latina y sigue en aumento de manera acelerada. La investigación se basó en el Modelo Integrativo de Betancourt y en el enfoque mixto-abajo-arriba de investigación cultural. Congruente con las hipótesis del estudio, el modelo de ecuaciones estructurales basado en el modelo integrativo, que incluyó la exposición a negligencia médica, creencias culturales vinculadas a la diabetes, estrés psicológico,

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y evitación médica como determinantes del HbA1c, una medición biológica de control diabético, mostró buen ajuste. El hecho de que el modelo de ecuaciones estructurales explique gran parte de la varianza del HbA1c aporta suficiente evidencia para ampliar el modelo integrativo en la explicación del fenómeno biológico con base en factores culturales y psicológicos.

Palabras Clave: Salud, Cultura, Diabetes, Creencias, Modelo Integrativo

Patient-physician interactions are critical to managing chronic diseases (Aikens, Bingham, & Piette, 2005; Ratanawongsa et al., 2013) such as type 2 diabetes mellitus (T2DM). Yet, racial or ethnic minority and lower socioeconomic status (SES) patients, who in the U.S. experience higher rates of T2DM, are also more likely to feel disrespected, not listened to, and treated unfairly in the healthcare system (Barr & Wanat, 2005; Blanchard & Lurie, 2004; Blendon et al., 2008). Despite physicians' best intentions to provide equitable care, research reveals that providers' implicit cultural biases about racial or ethnic minority and low SES patients influence their medical interactions, including visit length, affect, empathy, and patient-centeredness (Cooper et al., 2012; Penner et al., 2016). Because patient perceptions of poor quality-of-care and healthcare mistreatment impact their subsequent medical interactions (Hagiwara, Dovidio, Eggly, & Penner, 2016; Hausmann et al., 2011; Hausmann, Kwoh, Hannon, & Ibrahim, 2013) and treatment adherence behaviors (Kronish et al., 2013; Ortiz, Baeza-Rivera, Salinas-Onate, Flynn, & Betancourt, 2016), this is a particularly important issue for minority and low SES populations who, in the case of T2DM, are less likely to meet HbA1c goals and are more likely to die from the disease than non-Latino White (Anglo) Americans in the United States (Xu, Murphy, Kochanek, Bastian, & Arias, 2018).

The present study, which examines diabetes outcomes in a Latin American country experiencing high rates of this disease, builds on our previous research examining the implications of healthcare mistreatment and cultural beliefs on cancer screening behaviors among low SES Latin Americans (Latino) and Anglo Americans in the United States (Betancourt, Flynn, & Ormseth, 2011; Betancourt, Flynn, Riggs, & Garberoglio, 2010; Flynn, Betancourt, & Ormseth, 2011). That research in the area of cancer screening

was guided by a bottom-up mixed-methods research approach (Betancourt et al., 2010), which resulted in the identification of several instances of healthcare mistreatment experienced by culturally diverse patients during routine cancer screening. These instances of healthcare mistreatment reflected poor interpersonal quality-of-care, such that healthcare providers "treat me like an object" and "do not listen to me" (Flynn et al., 2015). This line of research also led to the identification of several cultural factors relevant to cancer screening behaviors such as cultural biases about healthcare providers (Betancourt et al., 2011) and cancer screening fatalism (Flynn et al., 2011). This collective body of research revealed that both healthcare mistreatment and cultural beliefs predict cancer screening, medical avoidance, and continuity of healthcare among low SES Latino American patients in the United States.

The present study was designed to examine the impact of healthcare mistreatment and cultural beliefs about diabetes on disease outcomes among T2DM patients. The study was conducted in Chile, a country in which the incidence of T2DM is one of the highest in South America and is increasing at an accelerated rate. In 2013 the prevalence of T2DM in Chile was 10.4% and by the year 2035 it is projected to reach 12.7%, surpassing the 11.6% projection for the United States (Guariguata et al., 2014). The increasing prevalence of T2DM in Chile and problems related to the management of this complex disease have been attributed to globalization, economic growth, and urbanization, including changes in diet, physical activity, and lifestyle in general (Uauy, Albala, & Kain, 2001).

The treatment of T2DM requires the management of complex medication regimens and lifestyle changes, which highlight the critical need for quality patient-provider relations to ensure successful clinical outcomes. Our research with indigenous T2DM patients in Chile,

however, reveals high rates of healthcare discrimination, attributed by patients to their lower levels of education and income (Ortiz et al., 2016). Moreover, these attributions of healthcare discrimination resulted in a greater likelihood that patients would discontinue their diabetes medical care. These findings suggest that social inequities and socioeconomic disparities between patients and providers, within the context of a classist society, can affect healthcare interactions and behaviors relevant to seeking medical care for T2DM.

In addition to the noted experiences of mistreatment and discrimination in the healthcare setting, many individuals with T2DM also report stigma and social rejection from society in general, across many life domains including work and relationships (Browne, Ventura, Mosely, & Speight, 2013; Liu et al., 2017; Schabert, Browne, Mosely, & Speight, 2013). These socially shared experiences among individuals with T2DM could have significant implications for psychological well-being and clinical outcomes. In fact, an international study indicates that approximately

45% of patients experience diabetes-related distress (Nicolucci et al., 2013), which is associated with poor medication adherence and glycemic control (Gonzalez, Shreck, Psaros, & Safren, 2015). These findings suggest an important need for research that can systematically investigate the impact of socially shared (i.e. cultural) beliefs about diabetes and healthcare mistreatment as determinants of psychological distress, treatment adherence, and T2DM outcomes.

The present research is guided by Betancourt's integrative theoretical model for the study of culture and behavior in psychology (Betancourt, Hardin, & Manzi, 1992; Betancourt & Lopez, 1993), adapted for health behavior (Betancourt & Flynn, 2009; Betancourt et al., 2010; Flynn et al., 2011). The model specifies how culture relates to health behavior and mediating psychological factors as well as to social structural factors conceived as sources of cultural variation. According to the Integrative Model (see Figure 1), aspects of culture (B) such as the socially shared beliefs, values, norms and practices relevant to

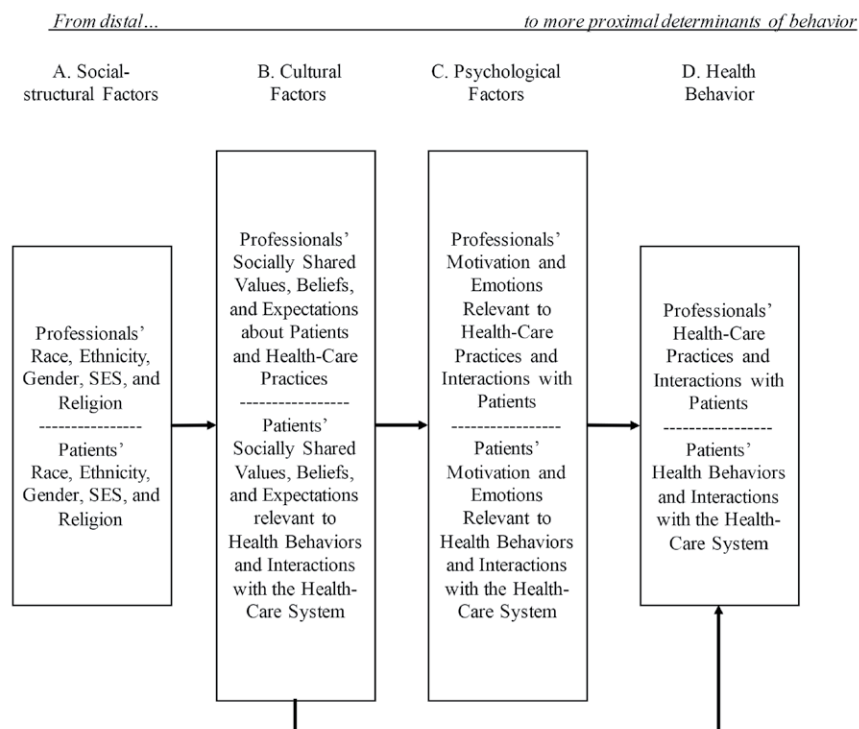


Figure 1. Betancourt's Integrative Model Adapted for Health Behavior.

Reprinted from: Betancourt and Flynn (2009).

T2DM can directly impact health behaviors (D), such as those involved in the management of T2D (e.g. attending diabetes care visits, adherence to prescribed treatment). These aspects of culture can also indirectly influence health behavior through psychological processes (C), such as the experience of distress associated with diabetes and medical treatment. Such aspects of culture (B) may be shared among members of groups, such as racial, ethnic, SES, or other communities (A).

In a manner consistent with the Integrative Model that has guided our previous work on the role of culture and healthcare mistreatment in the context of cancer screening, the aim of this study was to test the effects of healthcare mistreatment and cultural beliefs on psychological and behavioral phenomena relevant to treatment adherence and health outcome among T2DM patients in Chile. Specifically, it was hypothesized that patients' level of exposure to healthcare mistreatment and their cultural beliefs about diabetes-related social rejection will be associated with higher scores on treatment-related psychological distress. It was also expected that diabetes-related psychological distress would predict greater medical avoidance, which will in turn negatively impact HbA1c (i.e. elevated levels), a biological measure of diabetes control. By including HbA1c along with social structural, cultural, psychological, and behavioral variables, this study represents a preliminary effort to extend the scope of the Integrative Model to also account for biological outcomes.

Methods

This study was part of a larger research project designed to examine the role of culture, patient-provider healthcare interactions, and psychological factors relevant to treatment adherence and outcome among T2DM patients in Chile. Previous research (Ortiz et al., 2016) examined the impact of healthcare discrimination among T2DM patients of indigenous (Mapuche) background. The present study therefore focuses on the experience of healthcare mistreatment among non-indigenous Chilean T2DM patients.

Table 1

Descriptive Statistics for Study Variables (N=143)

	<i>n (%)</i>
Age	<i>M</i> = 55.64, <i>SD</i> = 14.41
Education	
Less than 8 years	53 (37.6%)
9-12 years	65 (45.5%)
More than 12 years	23 (16.2%)
Income	
\$0 - \$150,000	54 (37.8%)
\$151,000 - \$250,000	43 (30.1%)
\$251,000 - \$500,000	34 (23.8%)
\$501,000 - \$1,000,000	11 (7.7%)
More than \$1,500,000	1 (0.7%)

Participants

A total of 400 T2DM patients from La Araucania region of Chile participated in the larger research project. Inclusion criteria for that larger study included a minimum age of 18, diagnosis of T2DM for at least one year, and not dependent on insulin. For the purpose of the present study, additional inclusion criteria involved at least one reported experience of past healthcare mistreatment, as measured by the Healthcare Mistreatment Scale (Flynn et al., 2015). As discussed earlier, our previous work examined the impact of healthcare discrimination on indigenous Chilean (Mapuche) T2DM patient outcomes (Ortiz et al., 2015). Hence, the focus of the present study is on mainstream Chilean T2DM patients. Of the 254 non-indigenous T2DM patients included in the larger study, 143 reported at least one experience of prior mistreatment. Demographics for the study sample are described in Table 1.

Measures

Cumulative Exposure to Healthcare Mistreatment. The present study employed an adapted version of the Interpersonal Health Care Mistreatment scale (Flynn, et al., 2015), which was originally developed with low-income Latino and Anglo American women from Southern California, U.S.A., through a mixed-methods

research approach to instrument development (Betancourt et al., 2010). A similar mixed-methods approach was implemented with T2DM patients in Chile to refine existing items, eliminate non-relevant items, and identify additional instances of healthcare mistreatment experienced in the Chilean healthcare system. The adapted scale included seven items reflecting specific instances of negative interpersonal healthcare encounters such as a lack of respect and communication issues. Participants were presented with the seven items and asked to check a box if they ever experienced the mistreatment incident during a diabetes care visit. A sample item includes, "The physician showed no interest in me or my health." A cumulative exposure to healthcare mistreatment score was derived by summing the total instances of mistreatment endorsed by participants ($\alpha = .81$).

Cultural Beliefs about Diabetes-Related Social Rejection. Guided by the bottom-up cultural research approach to instrument development (Betancourt et al., 2010), qualitative interviews with 50 T2DM patients in Chile were conducted to identify cultural beliefs, values, expectations, and norms relevant to T2DM and treatment adherence. The bottom-up cultural research approach begins with specific observations relevant to an area of research (e.g. treatment adherence), which are derived through interviews from the population of interest (e.g. Chilean diabetes patients), and evolves from these observations to the development of quantitative instruments. An advantage of this approach is that it allows for the identification of aspects of culture directly from individuals, rather than based on stereotypical views.

One of the cultural factors that emerged from the bottom-up cultural research approach reflected cultural beliefs about the social rejection of diabetes patients. Two close-ended items were developed to assess this cultural construct. Participants were asked to think about diabetes patients and indicate the extent to which they agreed with the following statements, "diabetes patients feel left out by others at parties where there is eating and drinking," and "diabetes patients feel discriminated because of their disease". Responses were recorded on a 7-point Likert scale anchored at the extremes from "strongly disagree" to

"strongly agree". Reliability for this factor was good ($\alpha = .72$).

Medical Treatment Distress. The previously described mixed-methods research approach was also used to identify the psychological consequences of healthcare mistreatment, which resulted in the development of two items. Participants were asked, "As a result of what happened to you, were you more stressed or nervous about having to go to your next appointment?" and "As a result of what happened to you, were you more concerned about the future of your illness?" Participants responded to these items based on a Likert scale ranging from 1 "strongly disagree" to 7 "strongly agree". Higher scores reflect higher levels of distress. Reliability for the measure was .69.

Medical Avoidance. Participants indicated the extent to which they "postponed or delayed going to their next diabetes care appointment," as a result of the mistreatment incident. This item was based on a 7-point Likert scale, with higher scores reflecting greater medical avoidance.

Glycosylated Blood Glucose Level (HbA1c). Participants' HbA1c levels were measured at the time of data collection. HbA1c levels are indicative of the long-term level of glucose in one's blood. Higher HbA1c levels reflect poorer diabetes control.

Social Structural Sources of Cultural Variation. Demographic information including age, gender, income, and highest educational level, were self-reported on the demographic section of the research instrument.

Procedures

Approval for the study was obtained from the public university ethics committee for research and the regional office of the Chilean Ministry of Health (SEREMI de Salud, Region de La Araucanía). Participants were recruited through healthcare personnel and flyers posted and distributed at public and private healthcare centers. Individuals interested in participating contacted the study research office. Potential participants were provided with information on the study and were screened to ensure they met the study inclusion criteria. Eligible individuals were informed that their participation would involve answering a questionnaire

that took 30-45 minutes to complete. They were also told that they would receive free test-results of their HbA1c level and would be compensated 5,000 Chilean pesos (approximately \$10 USD) for their time. Those interested in participating scheduled a time for data collection and were provided with directions to one of the data collection locations.

Two research assistants were present during data collection, which included 4-6 participants per session. The research assistants reiterated the purpose of the study, reviewed the informed consent form, and obtained written consent from all participants. The research assistants distributed the questionnaire and encouraged the participants to ask any questions for clarification. If the participant was unable to read, one of the research assistants administered the questionnaire in a private setting. Once the questionnaire was completed, a trained research assistant obtained the participant's height and weight and administered the HbA1c test. Lastly, participants were given their HbA1c results and were provided with monetary compensation for their participation, which took approximately one hour including processing time for the HbA1c.

Statistical Analyses

Structural equation modeling with Maximum Likelihood (ML) estimation was used to test the study

hypothesis via EQS 6.3 (Bentler, 1985-2017). The data were screened revealing no outliers. Table 2 includes the means, standard deviations, and correlations among the study variables. There was a violation of multivariate normality and hence robust model fit indices are reported. Adequacy of model fit was assessed using the non-significant χ^2 goodness-of-fit statistic, a χ^2/df ratio less than 2.0 (Tabachnick & Fidell, 2001), a Comparative Fit Index (CFI) of .95 or greater (Kline, 2015), and a Root Mean Square Error of Approximation (RMSEA) of less than .05, with the upper limit of the 90% confidence interval less than .10 (Kline, 2015). In conjunction with theoretical and conceptual reasoning, the Wald and LaGrange test statistics were reviewed to determine if eliminating or adding paths would improve model fit and if so they were implemented in a step-wise manner.

Results

A structural equation model including the hypothesized theory-based relations among cumulative healthcare mistreatment, cultural beliefs about diabetes-related social rejection, medical treatment distress, medical care avoidance, and HbA1c was tested. Age, gender, income, and education were also included in the tested model as sources of variation in the cultural factor. A review of the Wald test statistic suggested

Table 2
Correlations, Means, and Standard Deviations for Study Variables

	1	2	3	4	5	6	7	8	9
1. Income	—								
2. Education	.53**	—							
3. Age	-.21**	-.31**	—						
4. Gender	.24**	.21**	.15	—					
5. Healthcare Mistreatment	.03	.03	.11	.11	—				
6. Cultural Beliefs	-.33**	-.31**	.08	.06	-.01	—			
7. Treatment Distress	-.30**	-.27**	-.05	-.04	.28**	.17*	—		
8. Medical Avoidance	-.13	-.10	-.09	-.04	.18*	.03	.49**	—	
9. HbA1c	.00	-.07	.00	.16	.12	.17*	.14	.21*	—
M	2.04	10.16	55.64	1.45	3.62	2.93	3.65	3.43	7.19
SD	2.12	3.94	14.41	0.50	2.34	2.08	2.25	2.52	1.94

* $p < .05$, ** $p < .01$, *** $p < .001$.

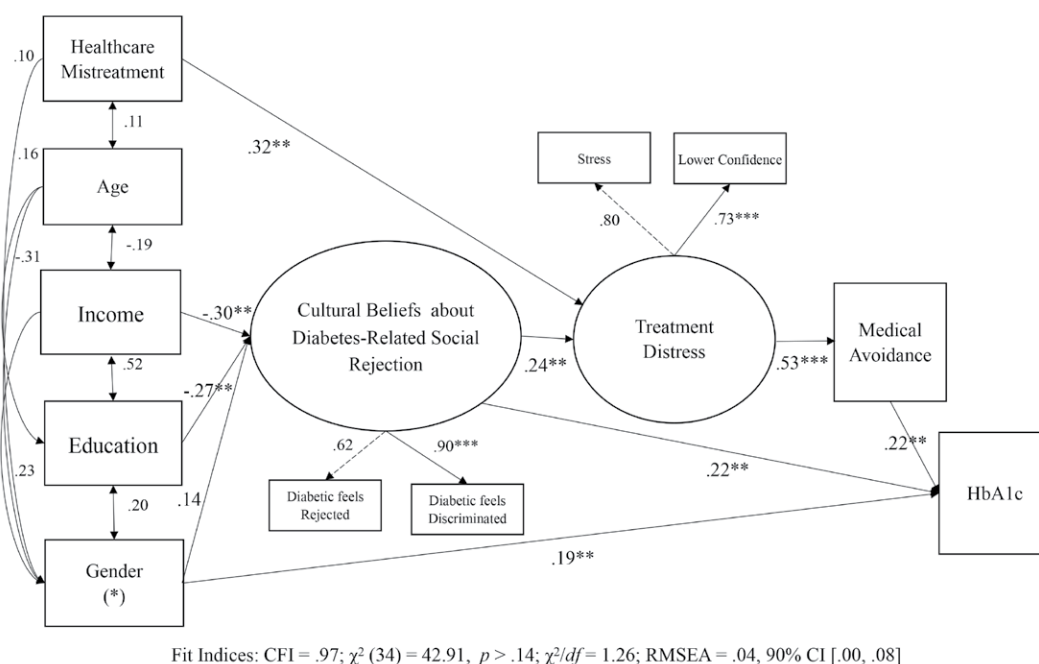


Figure 2. Results from the test of a structural equation model depicting the impact of healthcare mistreatment and cultural beliefs on treatment distress, medical avoidance, and HbA1c. (*) Female=0; Male=1

eliminating the path from age to cultural beliefs. In addition, the LaGrange Multiplier Test indicated that adding a path from gender and cultural beliefs to HbA1c would improve model fit. Because these suggestions were consistent with prior research employing the Integrative Model, they were implemented in a step-wise manner. The resulting structural equation model including the hypothesized theory-based relations fit the data well [CFI = .97; χ^2 (34) = 42.91, $p = .14$; $\chi^2/df = 1.26$; RMSEA = .04, 90% CI (.00, .08); see Figure 2]. The study variables accounted for approximately 15% of the variance in HbA1c.

Consistent with the study hypothesis, greater exposure to healthcare mistreatment and higher scores on cultural beliefs about diabetes-related social rejection were associated with higher levels of treatment distress ($\beta = .32$, $p < .05$; $\beta = .24$, $p < .05$), respectively. Higher levels of treatment distress predicted greater medical avoidance ($\beta = .53$, $p < .05$), which in turn predicted higher HbA1c ($\beta = .22$, $p < .05$). In addition, there was a direct effect of cultural beliefs about diabetes-related social rejection on HbA1c ($\beta = .22$, $p < .05$). Gender was also predictive of HbA1c such that males had higher HbA1c levels ($\beta = .19$, $p < .05$).

Also consistent with the integrative model guiding this research, lower income and education were predictive of higher scores on cultural beliefs about diabetes-related social rejection ($\beta = -.30$, $p < .05$; $\beta = -.27$, $p < .05$), respectively. Males also reported higher scores on cultural beliefs about diabetes-related social rejection ($\beta = .14$, $p > .05$).

Discussion

The test of the structural equation model including the theory-based structure of relations among healthcare mistreatment, cultural beliefs, distress, and medical avoidance as determinants of HbA1c, as a biological outcome of T2DM, fit the data well. These results, along with the finding that cultural beliefs associated with the social rejection of T2DM patients influenced HbA1, both directly and through its effect on the level of distress, are particularly significant. The fact that the way patients are treated by their healthcare providers increases the level of treatment-related distress, which in turn leads patients to avoid future medical interactions thereby impacting health outcomes, has major implications for healthcare.

Despite healthcare providers' best intentions to deliver high quality care to minority and low SES patients, it is possible that their biases and a lack of cultural awareness could unintentionally get in the way, ultimately resulting in poorer quality medical interactions and worse outcomes for patients from those populations. This suggests that, in order to improve health outcomes for T2DM and other chronic diseases, policies and interventions should include training on cultural competence, interpersonal communication skills, and the reduction of implicit biases in the healthcare system. This may improve medical interactions, the experience of patients in the healthcare system, and quality of care, all of which may positively impact patient health outcome.

From a theoretical and methodological perspective, the fact that the structural equation model accounted for a significant amount of variance in HbA1c is also quite noteworthy, as it represents a successful preliminary effort to extend the integrative model to explain biological phenomena. This is theoretically meaningful in that it illustrates how social structural and cultural factors may impact not only the psychological and behavioral phenomena, which we as psychologists tend to focus on, but also how such factors can explain variations in related biological outcomes.

In addition to confirming the fundamental propositions of the integrative model, results highlight the important role of psychological factors, such as distress, in understanding the influence of cultural and social structural factors in health behavior and outcome. This is important from a psychological perspective, as it confirms the need to consider relevant psychological processes when investigating health behavior and outcome from a cultural perspective. According to the integrative model, culture can influence behavior directly and/or through its effect on psychological processes. When the influence of psychological factors is not considered and no direct effect of culture on behavior is observed, one may wrongly conclude that culture does not play a role in that particular behavior. Consideration of these as well as the other findings of this study can significantly improve healthcare interventions.

Despite the significance of the study findings, there are limitations that must be considered. Specifically, even though the structure of hypothesized relations included in the structural equation model are solidly grounded in theory, the cross-sectional nature of the research must be noted. Hence, future research could further advance knowledge in this area by using structural equation modeling to test similar hypotheses with data from longitudinal research.

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