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Pilot Testing an Internet-Based STI and HIV Prevention Intervention With Chilean Women

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Abstract

Purpose: The incidence of sexually transmitted infections (STIs) and human immunodeficiency virus (HIV) is high among young Chilean women, and there are no STI or HIV prevention interventions available to them that incorporate technology. The purpose of this study was to investigate the preliminary efficacy of an Internet-based STI and HIV prevention intervention (I-STIPI) for Chilean young women on measures of STI- and HIV-related information, motivation, behavioral skills, and preventive behaviors.

Design: This is a pretest-posttest study. Forty young Chilean women between 18 and 24 years of age participated in an investigation of the I-STIPI's preliminary efficacy on STI and HIV prevention-related outcomes between baseline and a postintervention assessment. The intervention consisted of four online modules. Data collection was conducted in Santiago, Chile. Paired-samples *t* test analysis was used to determine whether there were significant differences in each of the outcome variables.

Findings: After receiving I-STIPI, women reported a significant increase in levels of STI- and HIV-related knowledge, attitudes toward the use of condoms and perceived self-efficacy, and a reduction of risky sexual behaviors with uncommitted partners.

Conclusions: The I-STIPI showed promise as an Internet-based intervention that can reduce barriers to accessing preventive interventions and increase STI and HIV preventive behaviors in young Chilean women.

Clinical Relevance: The study provided important information about the ability of an Internet-based intervention to reduce young women's risk factors and to provide positive preliminary efficacy on STI- and HIV-related outcomes. Internet-based interventions can eliminate many barriers to receiving prevention interventions and may prove to be cost effective.

The World Health Organization (WHO, 2012) reported an annual incidence of 499 million new infections of curable sexually transmitted infections (STIs), and it is estimated that globally 35.3 million people live with human immunodeficiency virus (HIV). In developing countries, STIs are an enormous burden of morbidity and mortality through their impact on reproductive and child health and through their role in the spread of HIV (WHO, 2007, 2012).

In Chile, there has been an increase in the number of STI and HIV cases, especially among women between 18 and 24 years of age (Chilean Ministry of

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Health [MINSAL], 2013), which is similar to trends seen worldwide. Chilean women younger than 25 years have been found to have the highest prevalence of syphilis, gonorrhea, chlamydia, and papillomavirus (MINSAL, 2014; Peredo, 2007; Santander et al., 2009), and a high percentage (45%) of STI-related medical visits (Santander et al., 2009).

There are several unique and interrelated risk factors in Chilean young women, such as liberalization of sexual behaviors, multiple partners, drug and alcohol consumption, stigma, intimate partner violence (IPV), and cultural factors, including *machismo* and *marianismo*. *Machismo* is defined as the construction of masculinity and the profile of a man as a provider who is independent, strong, willing to face danger, dominant, heterosexual, virile, knowledgeable, aggressive, and in control of his environment, including women. Meanwhile *marianismo* derives from the Virgin Mary or "María" and denotes the submission of women to men, with the ideal of women defined as being pure, dependent, vulnerable, abstinent until marriage, innocent, silent, and self-sacrificing (Cianelli, Ferrer, & McElmurry, 2008). Culture-related values and patterns such as these may increase Chilean women's risk for acquiring STIs and HIV by contributing to a lack of condom use, acceptance of infidelity by the male, domestic violence, and the absence of sexual communication and negotiation with their partners (Cianelli et al., 2008; Gonzalez, Molina, Montero, Martinez, & Leyton, 2007).

In addition to the unique set of risk factors, there are also barriers to prevention, such as lack of health education, lack of STI and HIV prevention efforts in the educational institutions, long wait times for medical care, and practitioner attitudes and behaviors that may lead to discriminatory practices (e.g., personal fear that they will contract the infection, judgmental attitudes, exaggerated precautions taken when treating a person living with HIV) and that interfere with high-quality prevention, treatment, and care (Chilean Ministry of Education, 2005; Cianelli et al., 2011; Dides, Benavente, & Morán, 2009).

Internet-based interventions have the potential to increase interest and participation in STI and HIV prevention programs (Bull, Pratte, Whitesell, Rietmeijer, & McFarlane, 2009; Noar, Black, & Pierce, 2009) and have shown favorable preventive behavior outcomes (Ritterband & Tate, 2009; Swendeman & Rotheram-Borus, 2010). Some of the major advantages provided by Internet interventions include standardization of the content, privacy and anonymity, and easy access to appropriate information from any place and at any time that is convenient. Internet interventions can also reduce obstacles experienced in face-to-face interventions, such as transportation, the cost of a place to meet, and the fear of embarrassment to discuss sensitive topics in front of other people (Ritterband, Thorndike, Cox, Kovatchev, & Gonder-Frederick, 2009; Tate, Finkelstein, Khavjou, & Gustafson, 2009).

Based on the promise of a culturally informed STI and HIV prevention intervention for young Chilean women that can address barriers to services, an Internet-based STI and HIV prevention intervention (I-STIPI) was developed and was shown to be highly feasible and acceptable in a sample of young Chilean women (Villegas et al., 2014). This intervention was culturally adapted for Chilean women and represented an innovation in the method of delivering STI and HIV prevention. This is the first intervention delivered online in Chile, to prevent STIs and HIV, that was designed to reduce barriers and to increase participation in prevention programs. The implementation of the intervention was feasible because of the high accessibility of the Internet and broadband connections in Chile, and the regularity in the use of the Internet (86%) among Chileans between 18 and 24 years of age (Godoy, 2011; Internet World Stats, 2013).

This article reports on Chilean women's risk factors and the preliminary efficacy of the I-STIPI as it concerns prevention-related STI- and HIV-related information, motivation, behavioral skills, and preventive behaviors. The findings regarding STI and HIV prevention-related outcomes can be used as a source of information for nurses working in STI and HIV prevention with women or young populations.

Methods

Design

This is a prospective cohort study (pretest–intervention–posttest). The preliminary efficacy of the intervention on STI and HIV prevention-related outcomes were measured using key constructs before (pretest) and immediately after the participation in the I-STIPI (posttest). All interventions and assessment measures were provided in Spanish.

The Information-Motivation-Behavioral Skills Model (IMB conceptual model) that focuses on behavioral change (Fisher & Fisher, 1992) guided the selection of measures used to evaluate I-STIPI's preliminary efficacy. According to this model, there are three determinants of STI and HIV preventive behavior: (a) information, referred to as knowledge about STI and HIV risk; (b) motivation, which includes personal attitudes and

social norms toward protective behaviors; and (c) behavioral skills, which relates to objective abilities for prevention (Fisher & Fisher, 1992).

Participants

Participants in the study comprised a convenience sample of 40 Chilean women 18 to 24 years of age, identified as Internet users with Internet access, and sexually active in the past 6 months (**Table** 1). The study was conducted in Santiago, Chile, the nation's capital and most populated city, with 6,685,685 inhabitants (The National Statistics Institute of Chile, 2013).

With regard to STI history, 10 participants (25%) reported that they had contracted an STI in their lifetime, and 4 participants (10%) reported that their partners had contracted an STI in their lifetime. Regarding drug use, 32 participants (80%) mentioned that they had tried drugs at some time in their lives. Among those who had used drugs ($n = 32$), the types of drugs were the following: marijuana (80%), cocaine (15%), marijuana mixed with other drug (17.5%), tobacco (10%), and pills (5%).

I-STIPI

The I-STIPI has four modules in Spanish, including in its content an overview of STI and HIV rates in Chile, transmission and impact of STIs (including HIV), prevention of STIs and HIV (e.g., abstinence, mutual fidelity, and condom use), partner negotiation and communication, prevention of domestic violence, and substance abuse. The development, feasibility, and acceptability of the I-STIPI are reported elsewhere (Villegas et al., 2014). **Table** 2 provides a description of the modules.

The I-STIPI website was password protected and each participant had a username and a password. The identities of study participants were not known by other participants in the study. Participants who completed three or more modules received an electronic certificate of completion.

Procedures

Institutional review board (IRB) approval from the University of Miami, USA, and the Escuela de Enfermería Pontificia Universidad Católica de Chile was obtained prior to recruitment because the study was affiliated with the University of Miami, and a local IRB was required to conduct the study in Chile. Two nurses conducted passive recruitment (flyers) in different public places, such as grocery stores, gyms, educational institutions, and community or computer centers in 15 communities in Santiago. The communities included low-, middle-, and high-income areas. In addition, some participants referred their friends to the study (snowball sampling). Young women who responded to the flyers by calling or sending an e-mail to the study team had the study explained to them and had their questions answered; after a verbal consent protocol, they were screened for inclusion criteria. All of the inclusion criteria were determined by direct questions to the women. If a young woman met the inclusion criteria, contact information was requested and a face-to-face appointment with the research team was scheduled at the participant's preferred location.

During the face-to-face appointment, the research team answered any additional questions the participant had, obtained formal informed consent, and obtained additional contact information. Women then completed an online assessment, and the research team was available to support with technical issues. After this face-to-face meeting, all additional study activities were conducted online. Women who needed referral for services were provided information depending on the type of referral needed. Participants received $20 in local currency (8,000 Chilean pesos) for their participation in assessments.

Measures

To measure the preliminary efficacy on STI- and HIV-related outcomes, two structured online questionnaires were used: one at baseline (before participation in the I-STIPI) and one immediately after participation in the I-STIPI (approximately 1 month after the baseline questionnaire). The questionnaires took approximately 30 min to complete and provided data on STI and HIV prevention-related information, motivation, behavioral skills, risk behaviors, and IPV. Five of the nine instruments used in this study were used in previous studies conducted with Hispanic samples (Cianelli et al., 2012; Givaudan, Poortinga, & Van de Vijver, 2005; Knight et al., 2010; Peragallo et al., 2005; Peragallo, Gonzalez-Guarda, McCabe, & Cianelli, 2012). A translation or back-translation process was conducted with four of the measures that were not available in Spanish (the Sexually Transmitted Disease Knowledge Questionnaire Subscale of the Sexually Transmitted Disease Knowledge Questionnaire, the Sexual Risk Scale, the Violence in the Relationship Subscale, and the Sexual Risk Survey).

STI- and HIV-related information. The General Knowledge Subscale of the Sexually Transmitted Disease Knowledge Questionnaire (Jaworski & Carey, 2007) was used to measure general knowledge about STIs. It included 12 true or false items regarding the following

Table 1. Characteristics of Chilean Women in the Study ($N = 40$)

Variables	*n* (%)	*M* ± *SD* (range)
Sociodemographic		
Age (years)		19.90 ± 1.99 (18–24)
Relationship status		
Single	39 (97.5)	—
Married	1 (2.5)	
Educational level		
Completed elementary school	1 (2.5)	—
High school education	18 (45)	
Technical education	3 (7.5)	
University education	18 (45)	
Who they live with		
Parents	28 (70)	—
Spouse or partner	5 (12.5)	
Other (i.e., relatives, alone)	7 (17.5)	
Religious background		
Catholic	17 (42.5)	—
Evangelic	5 (12.5)	
Other	4 (10.0)	
None	13 (32.5)	
Prefer not to answer	1 (2.5)	
Main occupation[a]		
Student	33 (82.5)	—
Employee	13 (32.5)	
Housewife	5 (12.5)	
Health Insurance		
No insurance	2 (5.0)	—
FONASA (public health insurance)	31 (77.5)	
ISAPRE (private health insurance)	4 (10.0)	
Other	3 (7.5)	
Health and sexual history		
Age of sexual initiation (years)		16.20 ± 1.98 (12–20)
Number of sexual partners (lifetime)		3.10 ± 3.50 (1–20)
Number of sexual partners (last month)		1.30 ± 0.79 (1–5)
Frequency of Internet use		
Every day	30 (75.0)	—
More than once a week	7 (17.5)	—
Once a week in the last month	3 (7.5)	—
Average time for Internet use in the last month (hr)	—	38.69 ± 59.69 (1–280)

Note. FONASA, Fondo Nacional de Salud; ISAPRE, Instituciones de Salud Previsional.
[a]Some participants reported more than one occupation/activity.

aspects: symptoms, consequences, transmission, prevention, detection, and testing. The total score indicated the number of items answered correctly (1 point for each correct answer, total score = 0–12; $\alpha = .67$).

STI- and HIV-related motivation. STI motivation was defined by two constructs pertaining to the IMB model: (a) attitudes toward the performance of STI and HIV preventive behavior, and (b) perceptions of social norms for such preventive behavior (subjective norms).

Attitudes were measured with 13 items pertaining to the Attitudes Toward the Use of Condoms Subscale taken from the Sexual Risk Scale (DeHart & Birkimer, 1997). Participants responded using a 5-point Likert scale (from 1 = *strongly disagree*, 2 = *disagree*, 3 = *neutral*, 4 = *agree*, 5 = *strongly agree*; total score = 13–65 points; $\alpha = .87$). A higher score represented more positive attitudes toward condom use.

Perception was measured using three scales: (a) the Traditional Gender Roles (TGR) Subscale (Knight et al., 2010), (b) the Perceived Social Normative Support for Violence Scale (Harrison, O'Sullivan, Hoffman, Dolezal, & Morrell, 2006), and (c) the Norms About the Use of Condoms Scale (Givaudan et al., 2005).

The TGR Subscale measured differential cultural expectations for males (breadwinner, independence, head of household) and females (child rearing, protection of girls). Participants responded to five items using a 5-point

Table 2. I-STIPI Module Description

I-STIPI Module Components	Description
Content	• Module 1: Orientation to the I-STIPI intervention and overview about STIs and HIV • Module 2: Understanding sexually transmitted infections (STIs) including HIV and AIDS • Module 3: Preventing STIs and HIV • Module 4: Partner communication, prevention of domestic/intrafamiliar violence
Length	• 40–50 min each
Activities	• Flash video presentation: Provided the content of the session (10–15 min) • Quiz: 5 questions about the content of the flash video presentation (5 min) • Video clip: Provided a testimony or a situation related with the contents of each module (5 min) • Blog: Participants discussed the content of the session (20–30 min)
Types of activities	• Individual activities: Flash video presentation, quiz, and blog • Group activity: Blog (participants were nested in groups of 10 participants)
Time period	• One week to complete the activities for each module. After 1 week, participants were able to review the activities of the previous modules.

Note. AIDS, acquired immunodeficiency syndrome; HIV, human immunodeficiency virus; I-STIPI, Internet-based STI and HIV prevention intervention.

Likert scale (1 = *not at all*, 2 = *a little*, 3 = *somewhat*, 4 = *very much*, 5 = *completely*; total score = 5–25 points; α = .77). A higher score represented higher presence of TGR. The Perceived Social Normative Support for Violence Scale, a 6-item Likert subscale, measured the presence of violence as a perceived social norm in sexual relationships. Participants responded using a 4-point Likert scale (1 = *strongly disagree*, 2 = *disagree*, 3 = *agree*, 4 = *strongly agree*; total score = 6–24 points; α = .85). Higher scores indicated stronger endorsement of violence as a norm in sexual relationships. Finally, the Norms About the Use of Condoms Scale is a three-item Likert scale that measured norms related to condom use. Participants responded using a 4-point Likert scale (1 = *disagree completely*, 2 = *disagree*, 3 = *neutral*, 4 = *agree completely*; total score = 3–15 points; α = .76). A higher score represented a higher presence of norms that support condom use.

STI- and HIV-related behavioral skills. STI behavioral skills were defined by three constructs pertaining to the IMB model: (a) perceived self-efficacy, (b) sexual communication, and (c) negotiation skills.

Perceived self-efficacy was operationalized with the Self-Efficacy for STIs and HIV Scale, a 10-item Likert scale (Ferrer et al., 2006) that measured self-efficacy for preventive STI and HIV risk behaviors. Participants responded using a 5-point Likert scale (1 = *not sure at all*, 2 = *a little bit sure*, 3 = *quite sure*, 4 = *very sure*, 5 = *completely sure*; total score = 10–50 points; α = .69). A higher score represented higher self-efficacy for STI and HIV prevention.

Sexual communication and negotiation skills with a partner were operationalized with a 10-item scale adapted from Catania et al. (1995) that identified whether a woman had discussed each of 10 topics related to STI prevention, including condoms, health negotiation efforts, and STI concerns with their partner(s) in the past month. The total score was calculated as the number of topics that they discussed with their main partner (1 point for each affirmative response; total score = 0–10 points; α = .77). A higher score represented higher levels of sexual communication and negotiation skills with a partner.

STI and HIV preventive behaviors. This construct was operationalized with 12 items pertaining to three subscales of the Sexual Risk Survey (Turchik & Garske, 2009). Eight items of the Sexual Risk Taking With Uncommitted Partners Subscale focused on the past month. The scale measured the number of (a) sexual partners, (b) uncommitted sexual partners (with whom they were not involved in a formal relationship), (c) sexual partners who were not tested for HIV and STIs (that they knew about), and (d) sexual partners that they did not trust. It also measured the number of times in the past month that women (e) had sexual intercourse with someone they did not know well or just met, (f) had sexual intercourse with a new partner before discussing risk factors (sexual history, intravenous drug use, disease status, and current sexual partner), (g) had sexual intercourse with someone with many past sexual partners, and (h) had partners with other current partners. The total score was the sum of the number of sexual partners and number of times they engaged in a specific risky behavior in the past month (0 = *any risky behaviors/any risky sexual partners*, and 1 or higher = *number of sexual partners and the number of times that women engaged in risky behaviors*; α = .93). A higher score represented less preventive STI and HIV behaviors in the past month.

Three items pertaining to the Risky Sex Acts Subscale measured the number of times that participants had

vaginal sex without a condom, gave oral sex to a man without a condom, or used alcohol or drugs before or during sex. In addition, one item of the Risky Anal Sex Acts Subscale was used to measure if participants had had anal sex in the past month without a condom. In each subscale, the total score was the sum of the number of times they engaged in a specific risky behavior in the past month. A higher score represented less preventive STI and HIV behaviors in the past month.

Intimate partner violence as an STI- and HIV-related risk factor. The HITS Tool for Intimate Partner Violence Screening (Sherin, Sinacore, Li, Zitter, & Shakil, 1998) measured IPV in the past month. Participants responded using a 5-point Likert scale (1 = *never*, 2 = *rarely*, 3 = *sometimes*, 4 = *fairly often*, 5 = *frequently*; total score = 4–20 points; $\alpha = .91$). A lower score represented less or no involvement in violent relationships in the past month.

Statistical analysis. The Statistical Package for Social Sciences version 18.0 (SPSS, Inc., Chicago, IL, USA) was used for data analysis. Descriptive statistics were used to analyze sociodemographic information and the levels of STI- and HIV-related information, motivation, behavioral skills, and IPV. Paired-samples *t* tests analysis was used in order to determine whether there were significant differences between pretest and posttest scores in each of the outcome variables. The type I error rate selected for calculating the *t* critical value was set at $\alpha = .05$. Of the 40 enrolled participants, 37 participants were retained at 1 month postbaseline assessment (92.5% retention at postintervention). This sample provided adequate power for the proposed analysis. The sample size estimation was obtained with the program G Power (Faul, Erdfelder, Lang, & Buchner, 2007), using *t* test sample estimation (difference between two dependent means, medium effect size, $\alpha < .05$, two-tailed test of significance, and a power = .8).

Results

The results for the outcome variables are presented in **Table** 3. The scores of the scales (means and percentages) for each outcome variable were examined to test whether they were significantly different at baseline and 1 month postintervention.

STI and HIV Information

The paired *t* test analysis of STI- and HIV-related information revealed a statistically significant pretest/posttest difference on the STI- and HIV-related information score [$t(34) = -8.67$, $p < .001$], with higher scores at postassessment ($M = 6.46$, $SD = 2.55$) as compared with baseline scores ($M = 2.51$, $SD = 2.13$). The percentage of correct answers increased from baseline to 1 month postbaseline for all of the items of the Sexually Transmitted Disease Knowledge Questionnaire Subscale.

STI and HIV Motivation

Attitudes toward condoms. There was a significant increase in the young women's levels of STI- and HIV-related attitudes toward the use of condoms. Participants had more positive attitudes toward condom use after the intervention ($M = 46.08$, $SD = 8.69$) than prior to the intervention [$M = 42.53$, $SD = 8.94$, $t(35) = -2.46$, $p = .019$].

Perception of social norms. There were no significant differences between baseline ($M = 8.97$, $SD = 3.08$) and 1 month postbaseline in the TGR subscale [$M = 8.6$, $SD = 4.37$, $t(35) = .60$, $p = .554$]. In addition, there were no significant differences between baseline ($M = 8.78$, $SD = 2.94$) and 1 month postbaseline in the Violence in the Relationship Subscale [$M = 8.64$, $SD = 3.0$, $t(36) = .33$, $p = .743$].

Finally, there were no significant differences between baseline ($M = 12.08$, $SD = 2.26$) and 1 month postbaseline in the Norms About the Use of Condoms Scale [$M = 12.11$, $SD = 2.68$, $t(35) = -.06$, $p = .952$]. However, it is important to mention that the mean scores in these scales reflected that at baseline participants had a low presence of the traditional gender roles ($M = 8.97 \pm 3.08$) in scores that ranged from 5 to 25 points, a low presence of a violent relationship as a social norm for sexual relationships, and a higher perception of social normative support for condom use.

STI and HIV Behavioral Skills

There was a statistically significant difference between the mean score of self-efficacy for STI and HIV prevention at baseline and 1 month postbaseline assessment [$t(33) = -.2.09$, $p = .044$], with higher scores at posttest ($M = 42.06$, $SD = 5.11$) compared to pretest ($M = 39.85$, $SD = 5.13$). There was no significant difference in the mean scores of partner communication between baseline ($M = 5.63$, $SD = 2.28$) and 1 month postbaseline assessment [$M = 5.71$, $SD = 2.73$, $t(34) = -.173$, $p = .863$].

STI and HIV Preventive Behaviors

There was a significant change in the Sexual Risk Taking With Uncommitted Partners Subscale between

Table 3. Change on STI- and HIV-Related Information, Motivation, Behavioral Skills, Behaviors, and Intimate Partner Violence

	Paired *t*-test analysis						
			95% confidence interval				
Constructs	Baseline (score ± *SD*)	1 month postbaseline assessment (score ± *SD*)	Lower	Upper	*t*	*df*	*p*
STI- and HIV-related information							
STI- and HIV-related knowledge	2.51 ± 2.13	6.46 ± 2.55	-4.87	-3.02	-8.67	34	< .001*
STI- and HIV-related motivation							
Attitudes toward the use of condoms	42.53 ± 8.94	46.08 ± 8.69	-6.49	-.62	-2.46	35	.019*
Traditional gender roles	8.97 ± 3.08	8.6 ± 4.37	-.87	1.59	.60	35	.554
Violence in relationships	8.78 ± 2.94	8.64 ± 3.0	-.69	.96	.33	36	.743
Norms about condom use	12.08 ± 2.26	12.11 ± 2.68	-.96	-.90	-.06	35	.952
STI- and HIV-related behavioral skills							
Perceived self- efficacy for STI and HIV prevention	39.85 ± 5.13	42.06 ± 5.11	-4.35	-.061	-2.09	33	.044*
Sexual communication and negotiation skills	5.63 ± 2.28	5.71 ± 2.73	-1.09	.92	-.173	34	.863
STI- and HIV-related preventive behaviors							
Sexual Risk Taking With Uncommitted Partners Subscale[a]	4.66 ± 5.19	2.49 ± 2.00	.551	3.79	2.72	34	.010*
Risky Sex Acts Subscale[a]	8.74 ± 10.97	9.91 ± 11.20	-4.30	1.94	-.767	33	.448
Risky Anal Sex Subscale	0.47 ± 1.9	0.31 ± .79	-.46	.79	.54	35	.591
STI- and HIV-related risk factors							
Intimate partner violence	5.19 ± 2.71	4.89 ± 1.58	-.62	1.23	.671	35	.507

[a]One participant reported very high frequencies in this scale. This outlier case was excluded from the paired *t*-test analysis.* $p < .05$.

baseline and 1 month postbaseline assessment [$t(34) = 2.72$, $p = .010$], indicating a reduction in participants' mean scores from baseline ($M = 4.66$, $SD = 5.19$) to 1 month postbaseline assessment ($M = 2.49$, $SD = 2.00$). There were no statistically significant differences in the Risky Sex Acts Subscale at baseline ($M = 8.74$, $SD = 10.97$) and 1 month postbaseline assessment [$M = 9.91$, $SD = 11.20$, $t(33) = -.767$, $p = .448$]. In addition, a paired-samples t-test revealed no statistically significant difference in the Risky Anal Sex Subscale at baseline ($M = 0.47$, $SD = 1.9$) and 1 month postbaseline assessment [$M = 0.31$, $SD = 0.79$, $t(35) = .54$, $p = .591$].

Intimate Partner Violence as an STI- and HIV-Related Risk Factor

There were no statistically significant differences in IPV scores between baseline ($M = 5.19$, $SD = 2.71$) and 1 month postbaseline assessment [$M = 4.89$, $SD = 1.58$, $t(35) = .671$, $p = .507$]. Psychological and verbal aggressions were the most reported types of violence, and these variables maintained a similar distribution from baseline to 1 month postbaseline assessment. Of the four participants who reported physical violence (e.g., if they were physically hurt) at baseline, three of them did not report physical violence at 1 month postbaseline assessment, and one participant reported a decrease of physical violence (from sometimes to rarely).

Discussion

The purpose of this article is to report the results of an investigation of the preliminary efficacy of a novel web-based STI/HIV prevention intervention. Overall, this study's findings supporting the efficacy on HIV- and STI-related outcomes are similar to those reported in research with Hispanic women (Cianelli et al., 2012; Peragallo et al., 2005) but did not require the face-to-face sessions used by those more traditional interventions. Two of the factors that may have influenced the preliminary efficacy of the I-STIPI was the high accessibility to the Internet and the familiarity with the use of technologies reported by participants. These results are congruent with other reports indicating the sharp increase in the use of the Internet, especially among young people in Chile (Godoy, 2011). The access and familiarity with the Internet were reflected in that the majority of the participants used the Internet every day, and in the high participation rates (between 70% and 85%) reported in the I-STIPI modules (Villegas et al., 2014).

The increase in knowledge from baseline to 1 month postbaseline assessment is important considering that a lack of pertinent information has been shown to be a threat to preventive behaviors (Bandura, 1990; Cianelli et al., 2012; Peragallo et al., 2012). The increase in the low baseline scores in STI and HIV knowledge may reflect the significance of this type of work among

Chilean women for whom health education generally, and STI and HIV prevention specifically, are not part of the educational system and education laws do not force the schools to implement sex education, which often leaves young women with inaccurate and limited information (Dides et al., 2009).

Young women in this study endorsed significantly more positive attitudes toward the use of condoms at the end of the study, which is defined by the IMB model as part of motivation for the behavioral change towards safer sex (Fisher & Fisher, 1992). Negative attitudes, including the view that condoms are expensive, reduce intimacy and sexual pleasure, and cause mistrust in the partner, have been linked to decreased condom use in young people (Chilean Commission on AIDS, 2000). The increase in the positive attitude toward condom use after the I-STIPI could be related to the increase in young women's knowledge and awareness about STIs and HIV. Also, after the intervention, participants were more aware of the consequences of risky sex acts, and this may have caused a change in their attitudes toward condom use.

Self-efficacy for HIV prevention is considered one of the strongest predictors for HIV prevention (Bandura, 1990; Peragallo et al., 2005; Villegas et al., 2013). In this study, the significant increase in self-efficacy could facilitate healthy decision making regarding preventive behaviors. Other studies conducted among Hispanic women have yielded similar results regarding high levels of perceived self-efficacy and STI and HIV prevention (Cianelli et al., 2012; Villegas et al., 2011).

Young women in this study reported a significant reduction in some risky sexual behaviors (e.g., the number of uncommitted sexual partners, sexual partners who were not tested for HIV, the number of times in the past month that they had sexual intercourse with someone they did not know well or just met). This risk reduction may have been a result of the significant increase in information about STIs and HIV and self-efficacy and the relationship among these variables (described in the IMB model), which could increase their awareness of the risk in having sex with partners that they did not know well or did not trust, or who had many past partners or other current partners, before discussing risk factors, or having sex with untested partners.

In addition, there was no statistically significant change on several of the other constructs measured. Young women did not report changes regarding perceptions of social norms, partner communication, and IPV, or change in condom use after the intervention. It is important to mention that some of these variables appear to have had a "ceiling or floor effect" (e.g., perception of social normative support for condom use and violent relationships as a social norm), which means the scores were so far in the desired direction at the baseline assessment that they did not have much room for improvement.

In the relation with IPV, it is important to mention that the majority of the participants (23 participants, 62.2% of the sample) did not report any type of IPV at baseline, which can explain the small change at 1 month postbaseline assessment (24 participants, 67.7% of the final sample). Finally, the lack of condom use can be related to the fact that Chilean women who are in a stable relationship tend to prefer being faithful as a form of preventing STIs and HIV. However, these women are still at risk because of the presence of cultural values such as *machismo* that promotes a high level of acceptance of infidelity and multiple partners by the male. This reinforces the need for HIV prevention interventions targeting these women who do not feel at risk and trust their partners.

Limitations

This study has several limitations that should be addressed in future studies. This study was a pilot study with a small sample that used a pretest-posttest design, which does not control for confounding variables that can influence the results of the study. In addition, women's self-report could influence the outcomes of the study. Future studies should assess the percentage of women who may reject this type of intervention because they do not consider themselves to be Internet users. This can impact the generalizability of the intervention.

Other limitations of this pilot study were the use of a convenience sample and the multiple *t* tests, which could increase the type I error rate. Another limitation of the study was the lower reliability ($\alpha < .7$) of two scales (General Knowledge Subscale of the Sexually Transmitted Disease Knowledge Questionnaire and Perceived Self-Efficacy for HIV Prevention) for this sample of Chilean women than expected based on previous research with HIV risk interventions. Probably the lack of STI knowledge and self-efficacy in some of the items of these scales caused inconsistent responses that affected the reliability of these scales.

Nursing Implications

This intervention included content that was culturally appropriate and relevant for STI and HIV prevention among Hispanics, including such constructs as machismo and *marianismo*, IPV, and substance abuse. This study has important implications for research, education, clinical practice, and policies in Chile and other Latin American countries. It reinforces the need to provide interventions

conducted by healthcare professionals, especially nurses, who can reach this high-risk population, which tends to underutilized health care. The study provided important information about young women's risk factors and STI- and HIV-related outcomes, which can guide healthcare workers in the delivery of content relevant for prevention among young women.

The I-STIPI can be used by nurses both in their own education and as a tool for intervention with patients. The I-STIPI can be instrumental in providing training on STI and HIV prevention to clinical nurses. This is relevant considering reports of deficiencies in knowledge about STI and HIV prevention, and of stigmatizing attitudes among nurses and other healthcare workers toward clients diagnosed with an STI or HIV (Cianelli et al., 2011; Norr et al., 2012). If nurses are trained using the I-STIPI, they can increase their knowledge and improve their attitudes using a nonthreatening and efficient tool. The I-STIPI can also be used as an intervention with patients. Nurses are in a unique position to touch many patients and to increase their motivation and readiness to seek further STI prevention interventions. Nurses can integrate the I-STIPI into their practice settings and have a cost-effective way to impact large numbers of patients by referring them to the website following their brief encounter. The I-STIPI can also be used as a reinforcement of the education that patients are already provided in healthcare centers, schools, or in the community, making a key contribution to more effective STI and HIV prevention in Chile and other countries. Finally, the findings lend additional support to the promise of Internet-based interventions and have the potential to reduce barriers to other types of similar services.

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Clinical Resources

- Chilean Ministry of Health (MINSAL). Information about the Chilean health care system and referral services for women: http://web.minsal.cl/
- Joint United Nations Programme on HIV/AIDS: http://www.unaids.org

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