

Stages of condom use and decisional balance among college students

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Aims: To explore sexual behaviours and condom use and differences in specific items of perceived benefits and barriers to condoms using the Transtheoretical Model (TTM) stages among college students in southern Taiwan.

Background: The TTM suggests that individuals in the action or maintenance stage exhibit higher levels of perceived benefits and lower levels of perceived barriers related to condom use than people in the precontemplation, contemplation or preparation stage.

Methods: This was a descriptive, cross-sectional design with cluster sampling among college students from two universities in southern Taiwan. Participants completed self-administered questionnaires, including demographic data, Sexual History and Condom Use Scale and Condom Use Decisional Balance Scale.

Results: Of the 279 participants, 57% were sexually active, of these only 11.9% used condoms consistently. Respondents in the TTM stage of action/maintenance perceived greater benefits in relation to feeling more responsible ($P = 0.031$) and protecting their partners as well as themselves ($P = 0.028$), and perceived more barriers in believing that using condom needs to rely on partner's cooperation ($P = 0.046$) than participants in precontemplation. Participants in precontemplation and contemplation perceived more barriers related to worry about making their partner angry if condoms were used than those in action/maintenance ($P = 0.008$).

Conclusion: Low levels of condom use among Taiwanese college students remain a significant public health concern. HIV prevention programmes for college students in Taiwan may be enhanced if they incorporate readiness to change and perceived benefits and barriers. Future research should include a larger sample with diverse groups.

Keywords: College Student, Condom use, Perceived Barriers, Perceived Benefits, Stages of Change, Taiwan

Introduction

The total population of Taiwan is 23 million. As of September 2008, 16 968 cases of HIV infection were reported in Taiwan

(Center for Disease Control, Department of Health, Executive Yuan of Taiwan 2008). Although the prevalence (0.07%) of HIV infection and AIDS cases in Taiwan is relatively low compared with other Asian countries (e.g. 1.4% Thailand, 0.8% Cambodia, 0.5% Vietnam, 0.3% India, 0.2% Indonesia) (UNAIDS 2007), the incidence of HIV infection in Taiwan has increased approximately 15% every year since 1997, one of the fastest growing rates of infection in Asia (Twu et al. 2004).

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Young adults between the ages of 20 and 29 comprised 42% of the HIV-infected population currently reported in Taiwan (Center for Disease Control, Department of Health, Executive Yuan of Taiwan 2008). Many of these young adults infected with HIV were likely exposed to HIV through unprotected sexual behaviours during their college years. The growing epidemic of HIV among young Taiwanese and the complexity of sexual decisions surrounding the prevention of HIV transmission was the impetus for this theory-driven study.

Background

Sexual behaviours among the Taiwanese population have been changing with the rapid development of a market economy and the wide exchange between Western and traditional Eastern cultures. Growing numbers of college students in Taiwan are engaging in sexual activity. Twelve per cent of male and 1% of female college students reported premarital sexual activities in a 1998 study (Yeh 1998) with more recent data (Chen 2003b; W.K. Tung, unpublished) showing that 63% of college students in Taiwan were engaging in sexual activity. The average age of first intercourse in Taiwan was reported at 20.6 years in 2001; by 2005, the average age had dropped to 18.9 years (Durex Global 2005).

Increased sexual activity among the young, as well as the increasing incidence of HIV infection, should place HIV prevention at the forefront of health promotion in Taiwan. Consistent use of male condoms has been shown to be an effective strategy in the prevention of HIV and other sexually transmitted infections (STIs) among sexually active individuals (Pinkerton et al. 1998). Yet, research examining condom use among Taiwanese college students has documented that while 55% report having more than two sexual partners during their lifetime, only 25% used condoms consistently (Chen 2003a; W.K. Tung, unpublished). These data challenge the efficacy of current HIV prevention and control programmes in Taiwan.

Conceptual framework

This study was guided by the Transtheoretical Model (TTM), which proposes that people adopt new behaviours by progressing through five stages of readiness. The stages of readiness for regular condom use were identified as: (a) precontemplation (individuals are not currently using condoms every time and do not intend to start in the next 6 months), (b) contemplation (individuals are not currently using condoms every time but intend to start in the next 6 months), (c) preparation (individuals are not currently using condoms every time but intend to start using condoms every time in the next 30 days), (d) action (individuals are currently using condoms every time for less than 6 months), and (e) maintenance (individuals are currently using

condoms every time for more than 6 months) (Grimley et al. 1997). Validity of the stages of readiness for individuals and their intentions and behaviours in condom use has been established with different populations, including college students (Grimley et al. 1995).

Decisional balance is another construct of the TTM and involves an evaluation of the perceived benefits and barriers of continuing current behaviours or adopting new behaviours (Prochaska et al. 2002). In this model, individuals in the action or maintenance stage exhibit higher levels of perceived benefits and lower levels of perceived barriers than people in the precontemplation, contemplation or preparation stage. TTM studies assessing condom use support these hypothesized relationships between stages of change and perceived benefits and barriers among gay and bisexual men (Gullette & Turner 2004), women at risk for HIV infection (Galavotti et al. 1995) and college students (Grimley et al. 1995). It is not clear whether college students in Taiwan engage in a rational weighing of benefits and barriers as the basis for using a condom during sex.

College student use of condoms is influenced by many factors including perceptions of the advantages (benefits) and disadvantages (barriers) of condom use. Protection from pregnancy has been identified as an important perceived advantage of condom use for college students (Civic 2000). Other studies have shown that the barriers related to condom use for college students include discomfort associated with condom use negotiation, reduction of pleasure, knowing partner's sexual history, embarrassment in purchasing condoms and partner's dislike or resistance to condom use (Civic 2000; Helweg-Larsen & Collins 1994; Lollis et al. 1997; Thompson et al. 1996; Wendt & Solomon 1995). Understanding perceived benefits and barriers to condom use within the framework of the TTM stages of readiness may be useful in determining which specific benefits or barriers differentiate between those college students who use and those who are thinking about using condoms. This understanding would be beneficial in the development of effective education programmes for HIV prevention.

Significance of the study

The Taiwanese government has adopted many HIV/AIDS prevention strategies, including the implementation of surveillance systems throughout Taiwan, the promotion of HIV/AIDS awareness activities, the provision of HIV counselling services and testing, and free treatment for HIV/AIDS patients (Center for Disease Control, Department of Health, Executive Yuan of Taiwan 2006). Total medical expenses for HIV/AIDS patients in Taiwan during 2006 topped NT\$1.54 billion. Prevention strategies during the early stages of an epidemic are more cost-effective than providing treatment for disease.

The constructs of TTM have been used to better understand factors associated with condom use and to develop interventions to modify those factors to increase the adoption of consistent condom use among younger populations (Cabral et al. 2004). The application of a theory-driven approach to assess college student behaviours with regard to condom use may provide new insights that will help nursing professionals design more cost-effective and appropriate HIV prevention interventions that are tailored to the specific characteristics and needs of this population.

Aims

The primary aims of this study were: (a) to explore sexual behaviours and condom use behaviours, and (b) to explore differences in specific items of perceived benefits and barriers to practicing condom use by the TTM stages among college students in southern Taiwan.

Methods

Design

A descriptive, cross-sectional design was used for this study. A self-reported questionnaire was administered to collect data from college students in southern Taiwan. Data were collected in March of 2006 and in March and April of 2007.

Participants and procedures

A cluster sampling method was used to recruit participants from two 4-year universities in southern Taiwan. Participants were clustered by university and academic standing. After receiving ethical approval from each of the universities, the registrar's office of each participating university was instructed to randomly select two courses from each academic level. Eight classes were selected from each participating university. The campus survey coordinator arranged for data collection in the classroom. The researchers approached students in the classroom and invited participation in the study. After explaining the nature and purpose of the study, the researchers distributed a questionnaire to the students. Students completed the questionnaire in front of the researcher and returned them to the researchers in the classroom or to the campus coordinator's mailbox. Students were assured that their responses would be confidential and that participation was voluntary.

Eligible subjects were included if they were: (a) aged 18 or older, (b) undergraduate students in non-health related majors, and (c) able to read traditional Chinese. Students majoring in the health professions were excluded from this study because their responses may not reflect those of the general college student population.

Instruments

The questionnaire consisted of three self-administrated instruments and took a total of 7–10 min to complete. The following provides a description of each instrument.

Demographic questionnaire

This questionnaire gathered information on each participant's age, sex, academic year, marital status, employment status and religious preference.

Sexual history and condom use scale

The sexual history questionnaire collected data about the types of sexual behaviours in which participants had ever engaged, age of first sexual activity and number of sexual partners since becoming sexually active.

The stage of change for condom use, as defined by TTM, was measured by the Condom Use Scale. This scale is a five-item algorithm and was originally developed by Grimley et al. (1995) to investigate condom use among heterosexual college students engaging in vaginal intercourse. Some modifications were made to simplify the questionnaire. Participants were categorized into one of the five TTM stages on the basis of questions about the frequency and duration of their condom use and intention to use condoms every time they have vaginal, oral or anal intercourse in the future (see Fig. 1).

Condom use decisional balance scale

This 10-item scale, five-item perceived benefit scale and five-item perceived barrier scale, was used to assess the perceptions of individuals concerning the benefits of and barriers to condom use (Grimley et al. 1995). Each item was measured on a five-point Likert scale ranging from 1 (not important) to 5 (extremely important). Higher scores represent more perceived benefits or barriers with condom use. In this study, the Cronbach's alpha scores were 0.83 and 0.92 for the benefits and barriers subscales, respectively.

Data analysis

The data was analyzed using SPSS version 15.0 (SPSS Inc., Chicago, IL, USA). Descriptive statistics were used to describe demographic variables, sexual behaviours and the distribution of participants among the stages of condom use. Chi-square was utilized to explore the relationship between gender and sexual behaviours. One-way analysis of variance (ANOVA) tests were performed to examine the differences in the level of perceived benefits and barriers among groups. Tukey's honestly significant difference (HSD) post hoc tests were applied to determine which specific pairs of stages of change differed significantly from one another in the level of perceived benefits and barriers. All

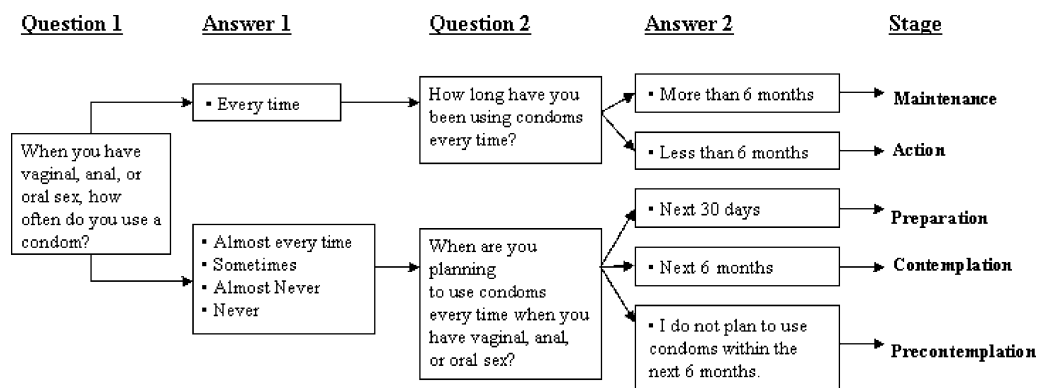


Fig. 1 Stage of change algorithm.

Table 1 Demographic characteristics of participants (N = 279)

Characteristics	Category	n	%
Sex	Female	179	64.2
	Male	100	35.8
Academic year	Freshman	53	19.0
	Sophomore	122	43.7
	Junior	61	21.9
	Senior	43	15.4
Marital status	Never married	233	83.5
	Married	43	15.4
	Divorced	3	1.1
Employment status	Full-time	27	9.7
	Part-time	86	30.8
	Full-time student	166	59.5
Religious preference	Buddhist	60	21.5
	Christian	33	11.8
	Taoist	63	22.6
	Shinto	6	2.2
	Muslim	3	1.1
	None	114	40.9

statistical analyses adjusted for age, gender, different schools and academic level. A significance level of $P < 0.05$ was applied.

Results

Demographic characteristics of participants

A total of 634 questionnaires were distributed to students. Of these, 279 were returned as fully completed and valid surveys, a 44% response rate. Of the 279 participants, the average age was 23.6 years old ($SD = 4.95$, range = 18–54). As described in Table 1, most were female (64.2%), sophomores (43.7%), never married (83.5%), full-time students (59.5%) and had no religious preference (40.9%).

Sexual behaviours of participants

Only 159 participants (57%) in the sample of 279 reported ever having sex. Significantly more males (72%) than females (48.6%) had sexual experience at the time of survey [$\chi^2(1, N = 279) = 14.33, P = 0.000$].

Of the sexually experienced participants, 87 (54.7%) were female and 72 (45.3%) were male. Significantly more female than male participants had engaged in (a) vaginal sex, 90.8% vs. 77.8%, $\chi^2(1, N = 159) = 5.22, P = 0.022$, and (b) oral sex, 83.9% vs. 65.3%, $\chi^2(1, N = 159) = 7.39, P = 0.007$. While significantly more males than females had had (a) anal sex, 13.9% vs. 3.4%, $\chi^2(1, N = 159) = 5.72, P = 0.017$, or (b) masturbation only, 22% vs. 9.2%, $\chi^2(1, N = 159) = 5.22, P = 0.022$.

Participants' mean age of first sexual experience was 18.68 ($SD = 2.97$) ranging from 10 to 28 years. The average number of sexual partners was 2.2 ($SD = 1.18$) ranging from one to four with 37.1% ($n = 59$) having only one sexual partner and 62.9% having two or more sexual partners.

Condom use and distribution of participants among the TTM stages

Condom use was waived for participants who reported having only had mutual masturbation, 24 cases fell into this category. Of the 159 with sexual experience, 135 (79 females and 56 males) engaged in sexual activities that would require condom use each and every time in order to prevent STIs. Among these 135 students, 48.9% used condoms sometimes ($n = 66$); 11.9% ($n = 16$) used condoms every time; 20% ($n = 27$) used condoms almost every time; and 18.5% ($n = 25$) never or almost never used condoms.

Participant responses were evaluated and categorized into stages of condom use. The majority (38.5%, $n = 52$) were in the contemplation stage, 30.4% ($n = 41$) were in the precontemplation stage and 18.5% ($n = 25$) were in the preparation stage. The

remaining participants were classified in the action ($n = 3$, 2.2%) or maintenance stage ($n = 14$, 10.4%).

Because of the small number of participants in the action and maintenance stages, a decision was made to collapse this variable in order to have more participants in fewer subgroups and thus strengthen the study's findings. Additionally, participants in the action and maintenance stages had been using condoms on a regular basis and their consistent future use of condoms was anticipated. A four-stage structure of the TTM was used in this study:

- 1 Precontemplation (30.4%, $n = 41$): Had never used condoms every time and did not intend to start in the next 6 months,
- 2 Contemplation (38.5%, $n = 52$): Had never used condoms every time but intended to start in the next 6 months,
- 3 Preparation (18.5%, $n = 25$): Had never used condoms every time but intended to start in the next 30 days, and
- 4 Action/Maintenance (12.6%, $n = 17$): Had used condoms every time in the past, from less than 6 months to more than 6 months, and intended to continue to do so.

Difference in the levels of perceived benefits and barriers

A one-way ANOVA and Tukey's HSD showed that stage groups were significantly different in the mean scores of two perceived benefits items (see Table 2). The perceived benefits were that using condoms made them feel more responsible [$M = 3.28$,

$SD = 1.6$ vs. $M = 4.24$, $SD = 1.0$, $F(3, 125) = 3.06$, $P = 0.031$] and protected their partners as well as themselves [$M = 3.43$, $SD = 1.6$ vs. $M = 4.65$, $SD = 0.5$, $F(3, 125) = 3.14$, $P = 0.028$], respondents in action/maintenance showed a significantly higher score for perceived benefits than those in precontemplation. No significant differences were found in the level of other benefits among any other stages.

As shown in Table 2, participants in precontemplation ($M = 2.76$, $SD = 1.5$) and contemplation ($M = 2.73$, $SD = 1.4$) reported a significantly higher score for perceived barriers to using condoms than those in action/maintenance ($M = 1.59$, $SD = 1.1$) based on a belief that condom use would make their partner angry, $F(3, 126) = 4.12$, $P = 0.008$. Participants in action/maintenance ($M = 3.88$, $SD = 1.3$) reported a significantly higher score for perceived barriers to condom use than those in precontemplation ($M = 2.83$, $SD = 1.5$) in believing that using a condom needs to rely on partner's cooperation, $F(3, 125) = 2.74$, $P = 0.046$. There were no significant differences between any other stages on perceived barrier items.

Discussion

At the time of this survey, 57% of the participants were sexually active. These findings are consistent with previous studies (Chen 2003b; W.K. Tung, unpublished) that 63% of the college-aged population in Taiwan is sexually active. Compared with Western

Table 2 Differences in the levels of perceived benefit and perceived barriers by stages of condom use

	PC	C	P	A/M	ANOVA	
	<i>M (SD)</i>				<i>F</i>	<i>P</i>
Perceived benefits						
I would be safer from disease	3.66 (1.4)	4.04 (1.2)	3.92 (1.1)	4.53 (0.6)	2.02	0.115
I would feel more responsible	3.28 (1.6)‡	3.83 (1.2)	3.36 (1.3)	4.24 (1.0)‡	3.06	0.031*
It protects my partner as well as myself	3.43 (1.6)‡	3.81 (1.4)	3.80 (1.4)	4.65 (0.5)‡	3.14	0.028*
It would be safer from pregnancy	3.32 (1.6)	3.76 (1.3)	4.00 (1.1)	4.29 (1.0)	1.61	0.189
It is easily available	3.22 (1.6)	3.71 (1.4)	3.52 (1.3)	4.18 (1.3)	1.63	0.187
Perceived barriers						
It makes sex feel unnatural	2.98 (1.4)	2.88 (1.4)	3.00 (1.3)	2.47 (1.7)	0.93	0.426
It would be too much trouble	2.93 (1.5)	2.77 (1.5)	2.88 (1.4)	2.00 (1.5)	2.38	0.073
My partner would be angry	2.76 (1.5)†	2.73 (1.4)†	2.44 (1.1)	1.59 (1.1)†	4.12	0.008*
I would have to rely on my partner's cooperation	2.83 (1.5)‡	3.46 (1.2)	2.96 (0.9)	3.88 (1.3)‡	2.74	0.046*
My partner would think that I do not trust him/her	2.46 (1.6)	2.50 (1.5)	2.04 (1.1)	2.18 (1.7)	0.47	0.702

Based on a Likert scale ranging from 1 (not important) to 5 (extremely important), the higher the score, the more the subject perceives the benefits of and barriers to regular condom use.

* $P < 0.05$.

†Participants in PC and C reported a significantly higher score than those in A/M.

‡Respondents in A/M showed significantly higher scores than those in PC.

A/M, action/maintenance; ANOVA, analysis of variance; C, contemplation; P, preparation; PC, precontemplation.

college students where 77–87% are sexually active (Davis et al. 2007; Noar et al. 2001; Scholly et al. 2005), fewer college students in Taiwan report being sexually active. This study also revealed a slight decrease in mean age of first sexual experience among sexually active participants, 18.68 years as compared with 18.9 years reported by a national sample of Taiwanese in 2005 (Durex Global 2005). However, when compared with other ethnic groups in the West, where the average age of first sexual experience is 13.6–16.6 years (Dilorio et al. 2000; Tapia-Aguirre et al. 2004), Taiwanese youth are significantly older than their Western counterparts at the time of their first sexual experience. Explanations for these differences in sexual activity may be because of emphasis on academic achievement in Taiwan and that many college students live with their parents and are under parental control, resulting in fewer opportunities for sexual activity (Tang et al. 1997). Moreover, Taiwanese society emphasizes the collective self rather than the individual self and sexual behaviours are frequently influenced by peers, parents or significant others. This emphasis means that young people in Taiwan are likely to engage in behaviours (sexual or otherwise) that are consistent with the values and beliefs of those with whom they associate.

The average number of sexual partners during the participants' lifetime was 2.2 with 62.9% having two or more sexual partners. It should be noted that only 11.9% used condoms every time. Additionally, 30.4% of sexually active participants were categorized in the precontemplation stage (not intending to use condoms). These data suggest that sexually active students did not routinely practice safer sex and did not intend to use condoms; hence, they are at risk for STI and HIV infection. HIV prevention programmes need to specifically emphasize the importance of using condoms consistently and minimizing the number of sexual partners. Furthermore, this population may need to learn how to inquire about their partner's sexual history when they engage in sexual activity. Significantly more males (13.9%) than females (3.4%) had engaged in anal sex, efforts to foster safer sex practices should be directed towards those who engage in anal sex.

Compared with participants in action/maintenance, precontemplators perceived fewer benefits from condom use in relation to feeling more responsible and protecting their partners as well as themselves. Participants in precontemplation also had a higher level of perceived barriers related to concern about making their partner angry if they ask their partners to use a condom. Education programmes should focus on enhancing their understanding of the relationship between condom use and HIV prevention and the individual's responsibility in protecting their partners and themselves from infection. However, simply teaching the facts of HIV transmission and condom use is not sufficient. HIV prevention education must include strategies for

negotiating condom use with sexual partners. Because participants in precontemplation are not even thinking about using condoms, educational programmes related to the advantages of condom use may be particularly important in moving them to the contemplation stage.

Participants in action/maintenance perceived more barriers in relation to relying on their partner's cooperation when using condoms. This finding is contrary to earlier TTM research on condom use which asserts that progressing from earlier stages to later stages is based on a decrease in perceived barriers (Galavotti et al. 1995; Grimley et al. 1995; Gullette & Turner 2004). It is possible that participants in the action/maintenance stage had already experienced problems associated with condom use during their previous sexual encounters, which might have had a negative impact on their perception of barriers to condom use. Also, although the TTM has successfully been applied to several population samples, the findings for these populations may not be generalizable to all populations.

TTM studies have demonstrated that health promotion programmes focusing on increasing the benefits of the desired behaviour is more effective than decreasing the barriers to the desired behaviour (Galavotti et al. 1995; Grimley et al. 1995). Nevertheless, interventions that target barriers to condom use, such as gaining a partner's cooperation for condom use, may be an important factor in developing consistent condom use. HIV prevention programme developers must remember that sex involves two people and that condom use is not just a one-person decision. Thus, interventions should also focus on sexual negotiation skills.

Limitations

This study has limitations. A small sample from southern Taiwan was used which limits the generalizability of the results. Replications with larger samples of Taiwanese college students randomly selected from diverse universities from different regions are warranted. A second limitation is the study's use of the self-report method, which may be subject to social desirability, and recall bias. This study was a cross-sectional design that excluded examination of causal inferences and potential variation in the assessed study variables over time. Finally, the survey used a self-administered questionnaire and resulted in a low response rate, 44%. Sex is a taboo subject in Taiwan society and this low response rate is probably driven by the types of questions asked. Internet surveys have been associated with an increased willingness to answer sensitive questions (Tourangeau 2004) and a web-based survey is recommended in the future to improve response rates. The response rate might have also been improved if announcements had been posted around the campuses prior to the survey, or if a follow-up system had been implemented (e.g. reminders) to encourage survey completion.

Implications

Nursing practice

This study has identified differences in perceived benefits and barriers to condom use for the TTM stages of readiness among Taiwanese college students. These results suggest that interventions which enhance the perceived benefits (e.g. using condoms protects their partners as well as themselves) and lowering perceived barriers (e.g. making partner angry by using condoms) for college students who are in the precontemplation stage may be useful in promoting *thinking* about implementation new condom use behaviours. HIV prevention programmes based on knowledge of the TTM stages of change and directed at specific perceived barriers or benefits to condom use gives nurses an opportunity to develop theory driven, evidence-based nursing practice.

Public health

Results from this study also have important implications for public health. Intervention strategies should incorporate positive social influence concepts in order to help Taiwanese students make better decisions. For example, HIV prevention programmes could target not only parents, students and peers, but also role models from television or popular culture to improve condom use, encourage sexual abstinence or delay sexual debut.

Conclusions

The study results suggest that inconsistent condom use is a problem among college students in Taiwan. It identified that specific perceived benefits and barriers play important roles in moving Taiwanese college students through the TTM stages of change for adopting condom use practice. Future study should identify other factors that help college students progress through the stages of TTM to action and maintenance. Better understanding of decision-making processes and sexual behaviours of this population will lead to development and implementation of effective health promotion strategies.

Author contributions

Wei-Chen Tung (WCT) was responsible for the study conception and design, and the drafting of the manuscript. WCT and Wei-Kang Tung performed the data collection and provided material support. Kele Ding and Chiu-Hsieh Hsu (CHH) performed the data analysis, and CHH provided statistical expertise. WCT and Suzette Farmer made critical revisions for important intellectual content. WCT supervised the study.

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