Using the Theory of Planned Behavior to Predict Condom Use Behavior among Thai Adolescents

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Abstract: This study sought to examine factors influencing condom use behavior, among Thai adolescents, using Ajzen and Fishbein's Theory of Planned Behavior (TPB). Theoretical relationships among attitudes, subjective norms, perceived behavioral control, intention and condom use behavior were examined using path analysis. The sample consisted of 607 adolescent students (332 females and 275 males) attending vocational schools in Bangkok, Thailand. The respondents ranged in age from 17 to 21 years.

The proposed model showed a good fit with the empirical data (chi-square = 2.27, df = 6, p= 0.894, GFI= 0.99, AGFI= 0.99, RMSEA= 0.00), with the adolescents' condom use behavior accounting for over 34% of the variance. To maximize consistent condom use among Thai adolescents, health care providers, both regionally and internationally, should link with multidisciplinary teams and policy makers to initiate intervention programs aimed at enhancing awareness of adolescents' intention and self control regarding condom use.

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Introduction

Risky sexual behavior is a major threat to adolescent health. Encouraging condom use is accepted as a health promotion method to reduce adolescent sexual health risk behavior worldwide.[1] Condom use behavior differs across cultures, therefore, it is important to understand the factors leading to sexual decision making behavior.[2] Thai adolescents tend to have early initiation of sexual activity and, most commonly, premarital sexual relationships.[3, 4] The prevalence of premarital sexual activity among Thai adolescents is increasing, as is unsafe sexual behaviors.[5] Thai adolescents pose a high risk for developing sexually transmitted diseases (STDs), HIV infections, unintended pregnancies and abortions, partly because of their failure to use condoms.[6] These new trends in Thai adolescent sexual activity have become major public health concerns affecting not only adolescents themselves, but also their families and the Thai soceity.[7]

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Review of Literature

Young Thais have been documented as using condoms infrequently, or inconsistently, despite widespread availability.[6-8] A recent study reported only 21.2 % of sexually active male high school students and 20.8 % of sexually active female high school students, in Thailand, used condoms.[9] Condom usage during their last sexual intercourse experience was reported by 27 % of sexually active Thai males and 0.5 % of sexually active Thai female high school and vocational students.[10] The low rate and inconsistent condom use among high school and vocational school students indicates the need for additional empirical studies with adolescents who engage in unprotected sex.

Although Thai adolescents are aware of the effectiveness of condoms to prevent transmission of HIV, only a small proportion report using condoms during sexual intercourse.[5, 9] Also, inconsistent condom use and high-risk social environments increase the probability of developing sexually transmitted diseases.[11] Efforts to increase the consistency of condom use have tended to rely on limited understanding of its determinants. Adolescents' decisions to use condoms may be influenced by the type and quality of sexual relationships.[12] Furthermore, condom usage has been reported to be more frequent in sexual encounters with sex workers, than with intercourse between teenagers.[13] In a recent study, most Thai adolescents reported engaging in unprotected sex and having their first sexual experience with their boyfriend or girlfriend.[6] In the same study, 44 % of the male adolescents reported using a condom only when having sex with sex workers; they did not use protection, of any type, when having sex with their girlfriends. Prior to development of preventive programs and intervention strategies, that are culturally specific to Thai adolescents, predictive factors and condom use behavior should be extensively and sensitively explored.[14]

Theory based interventions have proven effective in reducing risky behaviors among adolescents.[15] In Thailand, there have been limited theory-driven research, among adolescents, related to premarital sex and safer sex behavior. Few studies have applied a theoretical perspective to explore Thai adolescents' intentions to use condoms and how intention relates to condom usage.[7, 14] Therefore, the purpose of this study was to examine, through a theoretical framework, factors that might predict condom use behavior among Thai adolescents.

Theoretical Framework

This research was conceptually guided by the Theory of Planned Behavior (TPB)[16, 17] to examine Thai adolescents intention and condom use behavior within their attitudinal, subjective norms and perceived behavioral control parameters. According to the TPB, a central determinant of behavior is an individual's *intention* to perform a behavior.[16, 17] The theory postulates three conceptually independent determinants of intention. The first is the *attitude toward the behavior,* which refers to the degree to which the person has a favorable, or unfavorable, evaluation of the behavior. The second predictor is a social factor termed *subjective norm* that refers to the perceived social pressure to perform, or not perform, the behavior. The third determinant of intention is the degree of *perceived behavioral control*, which refers to the perceived ease, or difficulty, of performing the behavior, as well as anticipated impediments and obstacles that may be encountered.[16-18]

The antecedents of attitude, subjective norm and perceived behavioral control are corresponding beliefs, reflecting the underlying cognitive structure.[17] According to the TPB, human action is guided by three belief, including: (1) beliefs about the likely outcomes of the behavior, and an

evaluation of these outcomes (behavioral beliefs); (2) beliefs about the normative expectations of others, and motivation to comply with these expectations (normative beliefs); and, (3) beliefs about the presence of factors that may facilitate, or impede, performance of the behavior, and the perceived power of these factors (control beliefs). In their respective aggregates, behavioral beliefs produce a favorable, or unfavorable, *attitude toward the behavior*; normative beliefs result in perceived social pressure or *subjective norm*; and, control beliefs give rise to *perceived behavioral control.* In combination, attitude toward the behavior, subjective norm and perception of behavioral control lead to the formation of a behavioral *intention.*[17, 19]

The four major constructs of the TPB, as applied to this study, included attitudes toward condom use, subjective norms, perceived behavioral control and intention. The central contention was that people are more likely to use condoms if they previously have formed the corresponding intentions.[20, 21] Intentions to use condoms appear to derive from attitudes, subjective norms and perceived behavioral control.[20, 21] Thus, condom use is expected to be associated with attitudes, subjective norms and perceived behavioral control. All of which are expected to correlate with the indirect, belief based components (behavioral beliefs, normative beliefs and control beliefs).[20-22] No study could be located that has been conducted, in Thailand, using the TPB theoretical framework to predict condom use behavior. This study, using the TPB, hypothesized that intentions, among Thai adolescents, could be predicted from attitudes, subjective norms and perceived behavioral control with respect to condom usage.

Method

Design: A cross-sectional, correlational research design was used with path analysis to test, among Thai adolescents, causal relationships among attitude, subjective norms, perceived behavioral control, intention and condom usage. The study's sample size was calculated based on the number of subjects related to the number of model parameters.[23] Since the hypothesized model, in this study, had 23 parameters, a sample of at least 460 was required. Over sampling of approximately 20% was performed to assure adequate sample size. Thus, the needed sample size was estimated to be 552 participants.

Participants: Participants consisted of 607 (332 females and 275 males), multi-stage random sampled adolescents, who were enrolled in level 1 to 5 (Por-Wor-Cho 1 to 3, Por-Wor-Sor 1 to 2) in 21 public vocational schools in the metropolitan area of Bangkok, Thailand. As shown in **Table 1**, the majority of the students were: 16 to 17 years of age; Buddhist; children of married parents; living with both their mother and father; and, never sexually active. Most (n = 238; 39.2%) had grade point averages ranging from 3.01 to 4.00. The majority of the females (n = 175; 52.7%) had GPAs of 3.01 to 4.00, while less than half (n = 63; 22.9%) of the males had GPAs of 3.01 to 4.0. None of the females had a GPA ≤ 1.00.

Ethical considerations: Permission to conduct this research was obtained from Mahidol University's Institutional Ethics Review Board, as well from the administrators of the selected vocational schools. An official letter, from Mahidol University's Graduate Studies Office, introducing the study was sent to the director of each selected vocational school. The primary investigator (PI) gave each potential participant an information sheet that explained: the purpose of the study, what was involved in participating and that no risks were associated with participation. In addition to the information sheet, a consent form for the respective parents to sign and an assent form for each student to sign were included. Students who did not live with

Table 1 Demographic Characteristics of the Adolescents

Characteristics	Frequency % (*n*)		
	Male (n=275)	Female (n=332)	Total (n= 607)
Age (year)			
15	8.0 (22)	13.0 (43)	10.7 (65)
16	22.9 (63)	25.3 (84)	24.2 (147)
17	27.6 (76)	28.9 (96)	28.3 (172)
18	17.5 (48)	18.1 (60)	17.8 (108)
19	8.7 (24)	9.6 (32)	9.2 (56)
20	10.9 (30)	4.5 (15)	7.4 (45)
21	4.4 (12)	0.6 (2)	2.3 (14)
Education level			
Por-Wor-Chor 1	32.4 (89)	33.4 (111)	32.9 (200)
Por-Wor-Chor 2	42.5 (117)	37.6 (105)	36.6 (222)
Por-Wor-Chor 3	13.5 (37)	25.0 (83)	19.8 (120)
Por-Wor-Sor 1	7.3 (20)	7.2 (24)	7.2 (44)
Por-Wor-Sor 2	4.4 (12)	2.7 (9)	3.5 (21)
GPA			
0.00-1.00	2.5 (7)	-	1.2 (7)
1.01-2.00	16.4 (45)	3.6 (12)	9.4 (57)
2.01-3.00	38.2 (105)	35.8 (119)	36.9 (224)
3.01-4.00	22.9 (63)	52.7 (175)	39.2 (238)
Missing	20.0 (55)	7.8 (26)	13.3 (81)
Religion			
Buddhism	92.0 (253)	88.6 (294)	90.1 (547)
Christianity	0.7 (2)	1.5 (5)	1.2 (7)
Muslim	7.3 (20)	9.6 (32)	8.6 (52)
Missing	-	0.3 (1)	0.2 (1)
Parents' marital status			
Married	72.7 (200)	74.1 (246)	73.5 (446)
Separated/ Divorced/ Widowed	14.2 (39)	10.8 (36)	12.4 (75)
Living together not married	10.2 (28)	12.7 (42)	11.5 (70)
Father/Mother pass away	1.5 (4)	1.5 (5)	1.5 (9)
Don't know	1.5 (4)	0.9 (3)	1.2 (7)
The person whom adolescents live with the most of time			
Mother and father	64.0 (176)	65.4 (217)	64.7 (393)
Mother or Father only	16.0 (44)	12.7 (42)	14.2 (86)
Relative persons	14.2 (39)	17.5 (58)	16.0 (97)
Friend(s)	3.3 (9)	1.8 (6)	2.4 (15)
Living alone	2.2 (6)	0.9 (3)	1.5 (9)
Sister/ brother	0.4 (1)	1.8 (6)	1.2 (7)
Sexual intercourse in lifetime			
Never	48.0 (132)	72.3 (240)	61.3 (372)
Ever having sex	52.0 (143)	27.7 (92)	38.7 (235)

Por-Wor-Chor = Vocational Program (year 1-3)

Por-Wor-Sor = Higher Vocational Program (year 1-2)

GPA = Grade Point Average

their parents were asked to obtain signed consent from the teachers assigned as their official guardians. Students were asked to return, within one week, the signed consent and assent forms to their classroom teachers. The participants were assured that anonymity and confidentiality would be maintained and they could withdraw at any point without repercussions. Confidentiality of the respondents' answers was assured by use of code numbers on the questionnaires. A student was not included in the study if he/she did not return the signed consent and assent forms.

Procedure: Data were collected from October 2007 to March 2008. Prior to providing students with study information and consent/assent forms to sign, potential subjects were identified from randomly selected classrooms from each of the schools. The PI administered the study instruments to the students, in their classrooms, at a time designated by the respective school's administrators and classroom teachers. The PI also reviewed, with the students, directions for completing the study instruments. Each student took approximately 30 to 45 minutes to respond to the instruments. The PI was available in the respective classrooms, at all times, to further explain the study instruments and answer questions. In keeping with Thai traditions and respect, all students involved in the data collection process received small gifts as a token of appreciation for their time.

Instruments: Two instruments, including: the Demographic Data Questionnaire (DDQ) and the modified Theory of Planned Behavior Questionnaire (modified TPBQ), were used to collect data.[24] Based upon a prior study,[25] the PI developed DDQ requested information about each participant's: age, gender, school year, grade point average (GPA), religion, parental marital status, living arrangements and previous sexual experience.

Based on four major constructs (attitude toward condom use behavior, subjective norms, perceived behavioral control and intention), a modified version of the Theory of Planned Behavior Questionnaire[24] (modified TPBQ) was used to predict condom use behavior. The original version of the TPBQ was evaluated for content validity by a panel of seven Thai experts in the area of adolescent sexual behavior. The experts included two nurse educators, two educators experienced in the use of the TPBQ, two obstetricians/gynecologists who specialized in reproductive and sexual health and one child psychiatrist. The questionnaire was modified, based upon their comments, and unclear items were eliminated or reworded to improve clarity. The revised modified TPBQ was pilot tested with 95 adolescent vocational students who were similar to the subjects used in the study. All components of the instrument had good reliability with Cronbach's alpha coefficients ranging from 0.61 to 0.89. The revised modified TPBQ consisted of the following four major constructs:

1. Attitude toward condom use behavior: Indirect attitude was assessed by two scales that had eighteen behavioral beliefs and eighteen corresponding outcome evaluations. Participants rated their behavioral beliefs and evaluation of outcomes of condom use on a 5-point scale. For the behavioral belief measure (1 = strongly disagree to 5 = strongly agree), participants rated their level of agreement/disagreement on each of the behavioral beliefs (e.g. "Do you agree that condom use would prevent STD/HIV infection?"). Corresponding outcome evaluations were rated (1 = not important at all to 5 = very important) based on the level of importance in using condoms in specific situations (e.g. "Prevention of STD/HIV infection is a behavioral outcome from using a condom."). Item scores were calculated by multiplying the numerical value indicated for each of the 18 behavioral beliefs times the numerical value indicated for the corresponding outcome evaluation for each behavioral belief. A total score, which could range

from 18 to 450, was obtained by summing the multiplied scores across items. Higher scores suggested higher indirect attitude toward condom use.

Direct attitude was measured by way of 14 scales consisting of bipolar adjective pairs (i.e. risky-safe, bad-good, unhealthy-healthy and anxiety-relaxing) that were assessed on a scale using a set of 5-point semantic differential items ranging from 1 = extremely negative direction to 5 = extremely positive direction (e.g. "To use condom when having sex, I feel bad/good."). A total score, which could range from 14 to 70, was obtained by summing across all items. Higher scores suggested higher direct attitude toward condom use.

2. Subjective Norms: Indirect subjective norms were assessed by two scales that had seven normative beliefs and seven motivations to comply. Adolescents rated their perceptions of the strength of influential others' beliefs (father, mother, siblings, friends, partner, teachers and physician/nurse) about whether adolescents should use condoms and their motivation to comply with influential others' beliefs, using a 5-point scale (1 = definitely should not to 5 = definitely should). Participants rated their motivation to comply (e.g. "How likely do you want to, if your father wants you to use a condom?") on a 5-point scale (1 = very little to 5 = very much). The strength of each normative belief was multiplied by the corresponding motivation to comply with the influential others and the products were summed across the seven normative beliefs/motivations to comply items. The total score could range from 7 to 175. Higher scores suggested higher indirect subjective norms.

Direct subjective norms were determined by two items rated on a 5-point scale (1 = strongly disagree/not important to 5 = strongly disagree/important). The items asked the adolescents to indicate the degree of their beliefs regarding their: (a) agreement about important persons' beliefs that they should use condoms and (b) feelings about important persons' beliefs that you should use condoms. A total score, which could range from 2 10, was obtained by summing across items. Higher scores suggested higher direct subjective norms.

3. Perceived Behavioral Control (PBC): This indirect measure was assessed by two scales that had twenty control beliefs and twenty perceived power items. To obtain a belief measure, the participants rated, on a 5-point scale (1 = very difficult to 5 = very easy), the ease or difficulty of condom use when facilitating or inhibiting factors (identified in a previous elicitation study conducted by the PI for the purpose of modifying the TPB measurement) were presented. Adolescents' control beliefs, regarding each factor that affects their behavioral performance, were asked (e.g. "How easy or difficult is it for you to use a condom when you are concerned about getting pregnant?"). The perceived power were measured by responses on a 5-point scale (1= very unlikely to 5 = very likely) regarding the likelihood of condom use when identified facilitating or inhibiting factors were present (e.g. "If you are buying a condom at a convenient place, how likely or unlikely is it for you to use the condom when having sex?"). Scoring involved multiplying each perceived behavioral control belief by its respective control belief and summing the products across the 20 control belief/perceived power items. The total score could range from 20 to 500. Higher scores indicated higher indirect PBC.

Direct PBC measures were assessed by four items. Participants rated all items using a 5-point scale with opposing responses on each end, including: (a) the ease or difficulty of condom use (1= "very difficult" to 5= "very easy"); (b) the level of control over using condoms (1= "no control" to 5= "complete control"); (c) the level of the individual's judgment about using condoms (1= "strongly disagree" to 5= "strongly agree"); and, (d) the level of individual partners' agreements

about using condoms (1= "strongly disagree" to 5= "strongly agree"). A total score for direct PBC, which could range from 4 to 20, was calculated by summing the responses across all items. Higher scores suggested higher direct PBC.

4. Intention: This scale consisted of four items that measured behavioral intention to use a condom the next time when having sexual intercourse. The statements included: (a) "In case of an unobtainable condom for you, how likely is it that you will not have sex?" (1= "not likely at all" to 5 = "extremely likely"); (b) "I insist on using a condom when I have sex, although my partner does not want to use a condom." (1= "definitely do not" to 5 = "definitely do"); (c) "I plan to use a condom when I have sex the next time." (1= "definitely do not" to 5= "definitely do"); and, (d) "I intend to use a condom when I have sex the next time." (1= "definitely do not" to 5 = "definitely do"). The total score of intention, which could range from 4 to 20, was calculated by summing the responses across items. An average was then calculated to quantify an intention measure, with higher averages indicating greater intention to use condoms.

Condom use behavior, as a dependent variable, was measured by three items, including: (a) "In the next 6 months, I and my partner will use a condom when having sex." (1= "definitely not use," 2 = "rather not use," 3= "unsure," 4 = "rather use," and 5= "definitely use"); (b) "During the past 6 months, how often did you and your partner use a condom when having sex?"(1= "never," 2 = "used 1-3 times," 3= "occasionally, but not regularly," 4 = "frequently, but not regularly," and 5 = "every time when having sex"); and, (c) "The last time you had sex with your current partner, did you or your partner use a condom?" (0 = "No, a condom was not used" or 1 = "Yes, a condom was used"). A total score of condom use behavior, which could range from 2 to 11, was calculated by summing across all items. Higher scores suggested higher condom use.

The alpha coefficients for the various parts of the revised modified TPBQ were found to be: 0.82 for indirect attitude; 0.87 for direct attitude; 0.93 for indirect subjective norms; 0.78 for direct subjective norms; 0.83 for indirect perceived behavioral control; 0.74 for direct perceived behavioral control; 0.86 for behavior intention; and, 0.61 for condom use behavior.

Data analysis: Descriptive statistics (mean, standard deviation, percentage and frequency distribution) were performed to describe the sample. Bivariate correlations were calculated for study variables and Pearson's correlation was used to determine relationships among study variables. The Linear Structural Relationship program (LISREL)[26] was used to perform preliminary analysis and principle analysis for model testing. Path analysis[23, 27] was performed to test the causal relationships among the variables, within the revised modified TPB model, predicting condom use behavior.

Results

Correlation coefficients for the items measured are shown in **Table 2**. Attitude toward condom use, subjective norms and perceived behavioral control were found to be positively correlated with intention to use condoms. Perceived behavioral control over condom use was found to be positively correlated to condom use behavior. Intention to use condoms was found to be positively correlated with condom use behavior. Positive correlations were found between behavioral beliefs and attitudes toward condom use, normative beliefs and subjective norms. Also, control belief was found to be positively related to perceived behavioral control over condom use. The modified TPB causal model was tested and revised until a theoretically meaningful, and statistically acceptable, model was fitted to predict condom use behavior.

Data testing met the theoretical and statistical assumptions for path analysis. As shown in **Figure I**, path analysis validated the causal model of adolescent condom use behavior, while LISREL revealed a significant fit with a chi-square. The final model showed that all goodness-of-fit indices of adolescent condom use behavior predicted by the modified TPB model concurred with the empirical data. As shown in **Table 3**, all three paths from the indirect measures to direct measures were positive significant parameters. As predicted, the path led from behavioral beliefs to attitude, normative beliefs to subjective norms, and control beliefs to perceived behavioral control. For direct measures, attitudes had a positive direct influence on intention, subjective norms had a positive direct influence on intention, and perceived behavioral control had a positive direct influence on intention. In addition, perceived behavioral control had a positive direct influence on the outcome variable, condom use behavior. Intention also had a positive direct influence on condom use behavior.

Among the three indirect measures (behavioral beliefs, normative beliefs and control beliefs), three parameters indicated indirect relationship between the causal variables (antecedent) and condom use behavior, via intention. Behavioral beliefs had a positive indirect

Table 2 Correlation Matrix of the Study Variables (n = 607)

Variable	1	2	3	4	5	6	7	8
1.bboe	1.000							
2.nbmc	.487**	1.000						
3.cbpp	.531**	.513**	1.000					
4.Attitude	.508**	.438**	.393**	1.000				
5.SN	.470**	.481**	.567**	.552**	1.000			
6.PBC	.330**	.376**	.393**	.544**	.564**	1.000		
7.Intention	.365**	.434**	.357**	.509**	.511**	.407**	1.000	
8.Condom use	.344**	.374**	.319**	.396**	.416**	.378**	.523**	1.000
Mean	242.185	116.750	253.026	47.822	8.031	14.173	14.460	3.820
SD	52.222	38.284	53.923	7.665	1.707	2.462	3.226	1.036

**p < .01

bboe = Behavioral beliefs x Outcome evaluations

nbmc = Normative beliefs x Motivation to comply

cbpp = Control beliefs x Perceived powers

SN= Subjective Norms

PBC = Perceived Behavioral Control

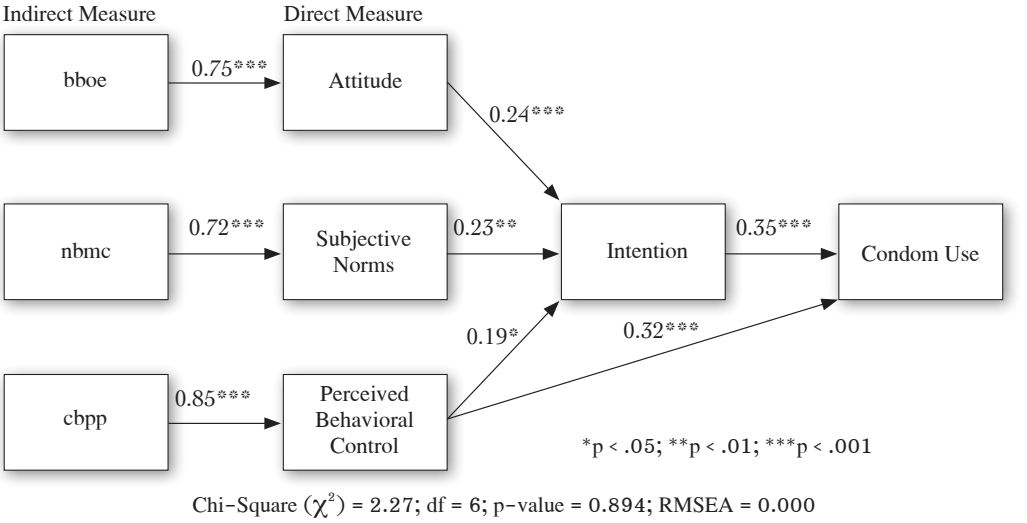

Figure 1 A Modified Model of Condom Use Behavior (n=607)

bboe = Behavioral beliefs x Ou0tcome evaluation
nbmc = Normative beliefs x Motivation to comply,
cbpp = Control beliefs x Perceived powers

Table 3 Effects Decomposition of Predictive Factors in the Modified Model for the Overall Sample (n= 607)

Path	Standardized Value		
	DE	IE	TE
bboe → attitude	0.75***	-	0.75***
nbmc → SN	0.72***	-	0.72***
cbpp → PBC	0.85***	-	0.85***
bboe → Intention	-	0.18***	0.18***
nbmc → Intention	-	0.17**	0.17**
cbpp → Intention	-	0.16*	0.16*
bboe → Condom use	-	0.06**	0.06**
nbmc → Condom use	-	0.06**	0.06**
cbpp → Condom use	-	0.33***	0.33***
Attitude → Intention	0.24***	-	0.24***
SN → Intention	0.23**	-	0.23**
PBC → Intention	0.19*	-	0.19*
Attitude → Condom use	-	0.08**	0.08**
SN → Condom use	-	0.08**	0.08**
PBC → Condom use	0.32***	0.07*	0.39***
Intention → Condom use	0.35***	-	0.35***

Note: $t > |1.96|$, *$p < .05$; $t > |2.58|$, **$p < .01$; $t > |4.00|$, ***$p < .001$
DE = Direct Effect; IE= Indirect Effect; TE = Total Effect
bboe = Behavioral beliefs x Outcome evaluation
nbmc = Normative beliefs x Motivation to comply, cbpp = Control beliefs x Perceived powers
SN= Subjective Norms, PBC = Perceived Behavioral Control

effect, via intention, on condom use behavior and normative belief had a positive indirect effect, via intention, on condom use behavior, while control beliefs had a positive indirect effect, via intention, on condom use behavior. Indirect effects on the indirect measures to intention also were found. Behavioral beliefs had an indirect effect on intention through the influence of attitudes; normative beliefs had an effect on intention through subjective norms; and, control beliefs had an effect on intention through perceived behavioral control.

All three variables of direct measure had a direct effect on intention. The parameter estimates indicated attitude, subjective norms and perceived behavioral control had a positive direct influence on intention. Attitude had a positive indirect influence, via intention, on condom use behavior. Subjective norms had a positive indirect influence, via intention, on condom use behavior. Perceived behavioral control had a positive indirect influence, via intention, on condom use behavior. Perceived behavioral control had a positive direct influence on condom use behavior. Comparing the total effect ($\beta = 0.39$, $p < .001$), that divided to direct effect ($\beta = 0.32$, $p < .001$) and indirect effect ($\beta = 0.07$, $p < .05$), resulted in a direct path from perceived behavioral control to condom use behavior. In addition, the direct path from intention to condom use behavior was significant in that intention had a positive direct influence on condom use behavior. The modified model explained 34% ($R^2 = 0.344$) of variance in the adolescents' condom use behavior.

Discussion

The Theory of Planned Behavior was used to predict relationships among the factors related to condom use behavior among Thai adolescents. Findings of the overall model supported the theoretical propositions. The LISREL model fit very well with the empirical data. The indirect and direct measures of attitudes, subjective norms and perceived behavioral control were predictive of condom use behavior among the Thai adolescents in this study. The results are consistent with previous findings that have shown attitude, subjective norms and perceived behavioral control have both direct and indirect effects on condom use behavior.[21, 28]

Intention: The greatest influence on condom use behavior in the model was intention. Adolescents with high levels of intention had high levels of condom use behavior. This finding was congruent with those of a prior study that revealed behavioral intention had a positive direct influence on condom use behavior.[29, 30] When intention is strong, confounding factors are less likely to directly impact behavior. In addition, intention is an immediate antecedent of behavior.[16] Intention plays a major role as a predictor of present and future condom use behavior. If people can increase intentions, they are more likely to increase actual condom use.[30]

Attitude: The results reveal attitude toward condom use had a positive indirect influence, via intention, on condom use behavior. Adolescents' beliefs regarding condom use for safe sex and health were viewed as more important than the feeling of unenjoyable and unexcited sex. This finding was congruent with a previous finding where impulsive decision making and sensation-seeking were negatively related to condom use, while healthy beliefs were a health promotion factor for condom use.[31] Attitude, in this study, was a person's judgment that using a condom is a good, or bad, behavior and one is in favor of, or against, performing the behavior. The more favorable a person's attitude toward condom use, the more she/he would intend to use a condom.[24, 32] Prior studies also have suggested that attitude explains the majority of variance in condom use behavior.[21, 33] In addition, attitude toward condom use had a positive

direct influence on intention. This indicates that the adolescents with more favorable attitudes toward condom use had higher levels of intention to use a condom. These adolescents appeared to believe condom use was a good behavior and viewed use of a condom as a human responsibility for healthy sexual practice and safer sex. This result was consistent with previous findings in which attitude related positively to intention.[28] Findings of this study confirmed the decision to use, or not use, condoms was associated with adolescents' attitude. In addition, attitude played a vital role in predicting intention, in that a positive attitude was associated with stronger intention to use condoms.[30, 34]

Subjective Norms: Subjective norms had a positive indirect influence, via intention, on condom use behavior. This finding indicated the importance of parents and family, even in adolescents' sexual decisions not to have sex or consistently use a condom if they did have sex. The results confirmed the idea that subjective norms were significant predictors of condom use behavior among adolescents. This finding is congruent with previous studies in which normative beliefs and subjective norms were significant predictors of condom use intention.[20, 28, 35-37] The salient referents for condom use behavior in adolescents elicited, in this study, were mother, father, teacher, siblings, partner, friends and physicians/nurses. Subjective norms, among this group of Thai adolescents, had a positive direct influence on intention.

Perceived Behavioral Control: Perceived behavioral control (PBC) had both a positive direct and indirect influence on condom use behavior. Adolescents who had high levels of PBC also had an increase in their condom use behavior. PBC, or facilitating conditions, are considered to moderate the effect of intention on behavior. Intention will have a greater effect on behavioral performance if PBC is high and PBC will have a greater effect on performance if intention is high.[20, 28] These findings were consistent with those of previous studies that used the TPB model to explain that PBC was a direct predictor of both intention and behavior.[21, 35] Adolescents' perceived control over condom use behavior was a supportive factor, rather than an inhibiting factor. Also, adolescents perceived the decision to use a condom depended on their judgment, rather than on other perceived controls. Consequently, successful condom use behavior depended not only on a favorable intention, but also on a sufficient level of perceived behavioral control.[17] In addition, the indirect path from PBC to condom use behavior was significant and mediated by intention. As PBC is an important determinant of intention or behavior, knowledge of the effects of control beliefs, concerning each facilitator or constraint factor, would be useful to promote healthy behavior. This knowledge can provide a focus for targeting the specific environmental factors in which control beliefs are most strongly associated with intention or behavior.[35]

The findings of this study support the theoretical relations proposed by the TPB. Among the three major components, attitude, subjective norm and PBC were direct influences on intention as the significant predictors regarding condom use behavior in adolescents. Also, the statistically significant predictors of condom use behavior were three major variables that had indirect influence, mediated through intention. The indirect measures of attitude, subjective norms and PBC were significant predictors of condom use behavior through intention. This indicates both indirect measure and direct measure of the three major variables were similar in predicting condom use behavior. Finally, the modified model explained the causal relationships among the TPB's constructs, as well as identified predictive factors of condom use behavior among Thai adolescents.

Contribution to Nursing Science

This study provided a description of: a) the phases involved in the application of the model, including the elicitation study; b) model component measurement with the pilot testing; and, c) analyses to explain condom use behavior. In addition, the study assessed the predictive validity of model constructs of intentions to use a condom and subsequent condom use behavior among sexually active, high-risk adolescents. The findings provided support for: a) a theoretical conceptualization of the correlates of intentions and behavior based on *model tailoring*, and b) development and testing of theoretical models that include both established predictors of health behavior and constructs relevant to target populations. Thus, the findings contribute knowledge for explaining and better understanding condom use behavior among Thai adolescents.

Conclusions and Recommendations

This cross-sectional, descriptive, study was conducted to test the causal relationships among major variables, including attitude, subjective norms, perceived behavioral control and intention, to explain and predict the influencing factors of condom use behavior among Thai adolescents. The hypothesized model was developed based on the Theory of Planned Behavior. The findings contribute to a growing body of theory-driven research that has examined behaviors and psychosocial factors associated with condom use. Hopefully, knowledge gained from the results will contribute to the design of culturally specific interventions and health promotion programs to reduce sexual risk behaviors among Thai adolescents.[14]

Future research is recommended to increase, by way of replication of studies that focus on diverse settings and population, the generalizability of the findings and expand the Theory of Planned Behavior. A cross-cultural study to compare different Asian cultures and minority populations of adolescents, with respect to different behavioral beliefs about condom use, may prove useful prior to development of meaningful healthy sex practice programs. Since the direction of any causation is problematic with cross-sectional designs, future research that uses longitudinal designs may prove more beneficial for drawing conclusions about causal relationships for subsequent self-report of actual condom use.

Study Limitations

The first limitation of this study is related to the PI modified TPBQ, especially since condom use and sexual activity are generally not discussed or disclosed in the Thai culture. A conclusion based on self-report of specific behaviors may contain errors. Self-report data of risk behaviors may not accurately reflect actual behavior. Respondents, depending on gender, may have exaggerated the extent to which they used a condom and/or promoted an image of practicing safe sex. In addition, the study population was limited to adolescents enrolled in vocational school in the metropolitan area of Bangkok, Thailand. Thus, the findings are not generalizeable to the entire Thai adolescent population (e.g. adolescents outside the specific schools used in the study and other vulnerable groups). Because lower alpha estimates of the condom use scale were derived from too few items to achieve sufficient variability, and the third item in the scale was scored as 0 to 1 (nominal data), interpretation of internal consistency of the outcome variable (condom use) was found to be problematic.[38]

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References

1. Centers for Disease Control and Prevention. Morbidity and Mortality Weekly Report: Youth Risk Behaviors Surveillance-United States, 2003. Surveillance Summary. May21, 2004; 53/No.SS-2.
2. Gebhardt WA, Kuyper L, Greunsven G. Need for intimacy in relationships and motives for sex as determinants of adolescent condom use. J Adolesc Health. 2003; 33: 154-64.
3. Podhisita C, Pattaravanich U. Youth in contemporary Thailand: Results from the family and youth survey. Nakorn Prathom (Nakorn Prathom), Mahidol Univ.: IPSR Publication; 1995.
4. Singh S, Wulf D, Samara R., Cuca YP. Gender differences in the timing of first intercourse: Data from 14 countries. Int Fam Plan Perspect. 2000; 26(1): 21-8.
5. United Nations Educational, Scientific and Cultural Organization. (UNESCO) 2005. [cited 2010 April 28] Available from: http://www.unescobkk.org/fileadmin/user_upload/arsh/News/2005/JulyAugust/451_filename_rhwomenthailand.pdf.
6. Ministry of Public Health, Thailand. Annual report of HIV/AIDS. Bangkok (Bangkok): Ministry of Public Health Press; 2002.
7. Thato S, Charron-Prochownik D, Dorn LD, Albrecht SA, Stone CA. Predictors of condom use among Thai vocational students. J Nurs Sch. 2003; 35(2): 157-63.
8. Piya-anant M, Kositanon U, Leckyim NA, Patrasupapong N, Watcharaprapapong O. Past and current STDs in a Thai adolescent population. J Med Assoc Thai. 1999; 82: 444-50.
9. Sangkarat O. The knowledge of attitude toward and practice of sex behavior and birth control of secondary school students in Suphanburi province. [thesis]. Bangkok (Bangkok): Mahidol Univ.; 1997.
10. Wuttiprasit R. Knowledge of attitude towards and experience in sex information of higher secondary school students in Bangkok. [thesis]. Bangkok (Bangkok): Mahidol Univ.; 1991.
11. Rew L. Adolescent health: A multidisciplinary approach to theory, research, and intervention. Los Angeles (CA): Sage Publication, Inc.; 2005.
12. Ellen J, Cahn S, Eyre S, Boyer C. Types of adolescent sexual relationships and associated perceptions about condom use. J Adolesc Health. 1996; 18: 417-21.
13. Mahuttano K. Factors influencing condom use among vocational education male students in Bangkok. [thesis]. Bangkok (Bangkok) Mahidol Univ.; 1996.
14. Khumsaen N, Gary FA. Determinants of actual condom use among adolescents in Thailand. J Assoc Nurses AIDS Care. 2009; 20(3): 218-29.
15. Jemmott JB, Jemmott LS, Hines PM, Fong JT. The theory of planned behaviors as a model of intentions for fighting among African American and Latino adolescents. Matern Child Health J. 2001; 5(4): 253-63.
16. Ajzen I. From intentions to action: A theory of planned behavior. In Kuhl J & Beckman J, editors. Action control: From cognition to behavior. New York (NY): Springer; 1985, p.11-39.
17. Ajzen I. The theory of planned behavior. Organ Behav Hum Decis Process. 1991; 50: 179-211.
18. Ajzen I, Madden TJ. Prediction of goal-directed behavior: Attitudes, intentions, and perceived behavioral control. J Exp Soc Psychol. 1986; 22: 453-74.
19. Ajzen I. Perceived behavioral control, self-efficacy, locus of control, and the Theory of Planned Behavior. J Appl Soc Psychol. 2002; 32: 665-83.
20. Jemmott LS, Jemmott JB III, Villarruel AM. Predicting intentions and condom use among Latino college students. J Assoc Nurses AIDS Care. 2002; 13(2): 59-69.

21. Albarracin D, Johnson GT, Fishbein M, Muellerleile PA. Theories of reasoned action and planned behavior as models of condom use: A meta-analysis. Psychol Bull. 2001; 127(1): 142-61.
22. Sutton S, McVey D, Glanz A. A comparative test of the Theory of Reasoned Action and the Rheory of Planned Behavior in the prediction of condom use intentions in a national sample of English young people. Health Psychol. 1999; 18(1): 72-81.
23. Hair JF, Anderson RE, Tatham RL, Black WC. Multivariate data analysis with readings. 6th ed. Upper Saddle River (NJ): Prentice Hall Inc; 2006.
24. Ajzen I, Fishbein M. Understanding attitudes and predicting social behavior, Englewood Cliffs (NJ) Prentice-Hall, Inc.; 1980.
25. Phuphaiboon R, Thanooruk R, Punpukdee O, Sirapo-Ngam Y, Khanobdee C, Kaveevivitchai C, et.al. Health promotion for early adolescents: Phase II and III. Bangkok (Bangkok): Mahidol Univ; 2002.
26. Jöreskog KG, Sörbom D. LISREL 8: User's reference guide. Chicago (IL): Scientific Software International, Inc; 2001.
27. Kline RB. Principles and practice of structural equation modeling. New York (NY): The Guilford Press; 1998.
28. Villarruel AM, Jemmott JB III, Jemmott LS, Ronis DL. Predictors of sexual intercourse and condom use intentions among Spanish-dominant Latino Youth: A test of the Planned Behavior Theory. Nurs Res. 2004; 53(3): 172-81.
29. Koniak-Griffin D, Lesser J, Uman G, Nyamathi A. Teen pregnancy, motherhood, and unprotected sexual activity. Res Nurs Health. 2003; 26: 4-19.
30. Phillips S. Intention and actual condom use for vaginal, oral, and anal intercourse. The Ohio State University, College of Nursing. 2005. [cited 2010 April 28] Available from: https://kb.osu.edu/dspace/bitstream/1811/549/1/stephanie_phillips.pdf
31. Broaddus MR, Bryan A. Consistent condom use among juvenile detainees: The role of individual differences, social bonding, and health beliefs. AIDS Behav [Published online: 20 June 2007] Springer Science+ Business Media, Broaddus & Bryan; 2008.
32. Armitage CJ, Conner M. Efficacy of the Theory of Planned Behavior: A meta-analytic review. Br J Soc Psychol. 2001; 40: 471-99.
33. Jemmott LS, Jemmott, JB III. Increasing condom-use intentions among sexually active black adolescent women. Nurs Res. 1992; 41(5): 273-9.
34. Craig DM, Wade KE, Allison KR, Irving HM, Williams JI, Hlibka CM. Factors predictive of adolescents' intentions to use birth control pills, condoms, and birth control pills in combination with condoms. Can J Public Health. 2000; 91(5): 361-5.
35. Montano D, Kasprzyk D. The Theory of Reasoned Action and the Theory of Planned Behavior. In Glanz K, Rimer BK, Lewis FM, editors. Health behavior and health education: Theory, research, and practice. 3rd ed., San Francisco (CA): Jossey-Bass. 2002; p. 67-96.
36. Bosompra, K. Determinants of condom use intentions of university students in Ghana: An application of the Theory of Reasoned Action. Soc Sci Med. 2001; 52(7): 1057-69.
37. Boer H, Mashamba M.T. Psychosocial correlates of HIV protection motivation among black adolescents in Venda, South Africa. AIDS Educ Prev. 2005; 17(6): 590-602.
38. Polit DF, Beck CT. Nursing research: Generating and assessing evidence for nursing practice. 8th ed. Philadelphia (PA): Lippincott Williams & Wilkins; 2008.

การใช้ทฤษฎีพฤติกรรมตามแผนทำนายพฤติกรรมการใช้ถุงยางอนามัยของวัยรุ่นไทย

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บทคัดย่อ: การศึกษาปัจจัยที่มีอิทธิพลทำนายพฤติกรรมการใช้ถุงยางอนามัยของวัยรุ่นไทย โดยใช้ทฤษฎีการแสดงพฤติกรรมตามแผนของไอเซ็นและฟิชบายน์ (Ajzen & Fishbein) ในการวิเคราะห์อิทธิพลหาความสัมพันธ์เชิงสาเหตุระหว่างตัวแปร ทัศนคติ การคล้อยตามกลุ่มอ้างอิง การรับรู้ความสามารถในการควบคุมตนเอง ความตั้งใจ และพฤติกรรมการใช้ถุงยางอนามัย กลุ่มตัวอย่างได้แก่ นักเรียนระดับอาชีวศึกษา เขตกรุงเทพมหานคร จำนวน607 คน เป็นหญิง 332 คน และชาย 275 คน อายุระหว่าง 15 ถึง 21 ปี ผลการศึกษาพบว่าโมเดลที่เสนอมีความสอดคล้องกับข้อมูลเชิงประจักษ์ (Chi-square= 2.27, df= 6, p = 0.894, GFI = 0.99, AGFI = 0.99, RMSEA= 0.00) โดยสามารถอธิบายความแปรปรวนของพฤติกรรมการใช้ถุงยางอนามัยในวัยรุ่นไทยได้ร้อยละ 34.4 การเพิ่มอัตราการใช้ถุงยางอนามัยของวัยรุ่นไทย บุคลากรทีมสุขภาพทั้งในระดับภูมิภาคและนานาชาติ ควรประสานงานร่วมกับทีมสหสาขาวิชาชีพและผู้กำหนดนโยบายแนวทางในการพัฒนาโปรแกรม เพื่อเพิ่มความตระหนักรู้เกี่ยวกับความตั้งใจและการควบคุมตนเองในการใช้ถุงยางอนามัยของวัยรุ่นไทยต่อไป

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คำสำคัญ: วัยรุ่น, การใช้ถุงยางอนามัย, ไทย, ทฤษฎีการแสดงพฤติกรรมตามแผน

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