Correlates for Consistency of Contraceptive Use Among Sexually Active Female Adolescents

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This study explored the correlates for consistency of contraceptive use among sexually active female adolescents in Kaohsiung County, Taiwan. Overall, 164 female adolescents who had engaged in sexual behavior within the last 6 months and were not pregnant at the time of the study were selected from two vocational high schools in Kaohsiung County, Taiwan. An anonymous questionnaire was used to measure demographic data, contraceptive attitudes, contraceptive knowledge, contraceptive self-efficacy, perception of peers' use of contraceptives, sexual history, and contraceptive use. The results showed that 45.7% of subjects had sex once or more per week, and that 39.6% of subjects always used contraceptives while 15.2% never used contraceptives. Condoms were the most popular contraceptives (51.2%) and the withdrawal method was the second most popular (23.8%). Stepwise logistic regression showed that higher contraceptive attitudes (odds ratio, OR, 1.148) and previous contraceptive education in school (OR, 3.394) increased the probability of consistently using contraceptives, correctly classifying 67.2% of the sample.

Key Words: sexually active female adolescents, consistency of contraceptive use
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In Taiwan, 13 of every 1,000 females aged between 15 and 19 years of age give birth [1], which is the highest rate among Asian countries [2]. However, the pregnancy rate remains underestimated because of the social stigma of adolescent pregnancy in Taiwanese culture [3]. The rate of sexual activity among Taiwanese female adolescents increased more than six-fold from 1% in 1983 to 6% in 1995 [2]. Although abstinence is the best way for adolescents to avoid pregnancy, it is an impractical or unacceptable option for many sexually active adolescents. This leaves contraception as the only means by which female adolescents can avoid the negative consequences of being sexually active. Consistency of contraceptive use has a positive association with pregnancy prevention among female adolescents [4]. Understanding the correlates for consistency of contraceptive use among female adolescents is important in designing education programs and health services to assist sexually active female adolescents in preventing unwanted pregnancy. However, few studies have addressed the factors that are associated with consistency of contraceptive use among female adolescents. In addition, most published studies are from Western countries, with only a few from Asia. Research investigating the contraceptive behavior of female adolescents in Taiwan is lacking.

Adolescents' contraceptive decisions have been considered to be made through a rational process [5]. Many psychosocial factors are related to contraceptive use among female adolescents, including contraceptive knowledge and contraceptive attitude [6–10]. An increase in self-efficacy contributes significantly to a female's use of contraceptives [11], and contraceptive self-efficacy is the most important predictor of contraceptive use in sexually active college women [6]. The use of alcohol and other substances is more common among sexually active adolescents than among

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those who are sexually inactive [12]. As mood-altering substances may interfere with contraceptive use [13], the relationship between substance use and consistency of contraceptive use deserves further study. In addition, adolescence is a stage of developing identity. Peers can influence a girl's sexual debut and pregnancy risk [14], and they are the most common source of information about sexual activity and birth control in adolescents [15]. Therefore, peers' contraceptive behavior may influence the contraceptive practice of female adolescents. How female adolescents perceive their peers' contraceptive behavior might influence their consistency of contraceptive use.

One study found that adolescents who had received formal contraceptive education had higher contraceptive intentions [16], which may influence their practice of contraception.

A history of sexual activity may correlate with contraceptive behavior. The earlier a young woman engages in sexual intercourse, the less likely she is to use contraceptives [17]. Younger age at first sexual intercourse and previous pregnancy are important factors that determine contraceptive behavior in sexually active adolescent women [18]. Frequency of sexual intercourse has also been shown to be a strong indicator of contraceptive use [4]. Failure to use birth control at first coitus is associated with poor contraceptive behavior [19].

Demographic characteristics relate to contraceptive use. Younger age [18] and lower socioeconomic status [20] correlate with non-use of contraceptives. Young women who come from two-parent families have been found to be at least 2.5 times more likely to report responsible contraceptive behavior than women from one-parent families [21].

With a better understanding of the factors that influence consistency of contraceptive use in sexually active female adolescents, health professionals may be able to develop effective prevention and intervention programs to reduce unintended pregnancies. The purpose of this study was to identify important factors affecting consistency of contraceptive use among sexually active female adolescents, and it is the first such investigation in Taiwan. Demographic characteristics, contraceptive knowledge, contraceptive attitude, contraceptive self-efficacy, perception of peers' use of contraceptives, and history of sexual activity were independent variables. Consistency of contraceptive use was a dependent variable. The results of this study should add to the understanding of consistency of contraceptive use among sexually active female adolescents in Taiwan and serve as a reference for researchers in other regions.

Methods

Sample

This was a cross-sectional survey. Female adolescents who had engaged in sexual behavior within the last 6 months and were not pregnant at the time of the study were eligible to participate. As premarital sexual behavior is a social taboo in Taiwan, female adolescents do not openly reveal that they are engaging in sexual behavior. It is, therefore, difficult to obtain sexually active female adolescents by directly inviting them to participate in this study. Eligible participants were selected using a filter procedure.

Two vocational high schools were selected by purposeful sampling. Class cluster sampling was used and five classes were randomly selected from each of the 10th, 11th, and 12th grades in each school. Female adolescents in each class were invited to participate. An anonymous questionnaire was used, which included basic demographics, sexual history, contraceptive use, contraceptive knowledge, contraceptive attitude, contraceptive self-efficacy, perception of peers' use of contraceptives, and the question, "Have you had sex within the last 6 months?" Participants who had had sex within the last 6 months were asked to answer questions about their sexual history and contraceptive use, while participants who responded that they had not had sex within the last 6 months were asked to answer questions regarding their intentions to use contraceptives.

Among 920 participants who finished the questionnaire, 164 participants (17.8%) had had sex within the last 6 months and their data were used in the analysis. Data were collected in the classroom and the questionnaires were administered by a trained research assistant. All students were informed that there was no penalty for refusal to participate and that they could decline at any time. Completion and return of the questionnaire was considered an indication of informed consent for study participation. Data were collected between February and July 1999.

Measures

The structured questionnaire used in this study included the following item areas detailed below.

Questions on basic demographics gathered information on socioeconomic status (obtained from the highest occupational and educational level among parents), family structure, cigarette use, alcohol use, and extent of contraceptive education in school.

Sexual history data were obtained on first sexual intercourse, history of previous pregnancy, use of contraceptives at first sexual intercourse, and frequency of sexual inter-

course within the last 6 months.

Consistency of contraceptive use, including the major contraceptive method used over the last 6 months, was measured using a scale developed by the authors. Consistency of contraceptive use refers to the proportion of times that a participant used contraceptives relative to the total number of times that she had engaged in sexual intercourse. Responses could be "none of the times", "occasionally, less than half of the times", "sometimes, about half of the times", "frequently, more than half of the times", and "always, all of the times". Participants also chose the major contraceptive method used within the last 6 months from a list of contraceptive methods.

The contraceptive knowledge scale, developed by Lin [16] and comprising 21 items, was used to assess knowledge of reproductive anatomy and physiology, as well as effectiveness and use of contraceptive methods. The multiple-choice responses to these items were "true", "false", and "do not know". There were 25 items originally and, based on item discrimination, the 21 items whose index of discrimination was greater than 0.20 and index of item difficulty was between 0.20 and 0.80 were retained. A total score was obtained by summing the correct responses (1 point each) across the 21 items. Possible scores ranged from 0 to 21, with higher scores indicating better contraceptive knowledge. The Kuder-Richardson internal consistency was 0.79 in this study.

The contraceptive attitude scale, also developed by Lin [16], included 19 items measuring positive and negative beliefs about contraceptive practice. Each item represented a belief statement that was rated on a four-point scale from 1 (strongly disagree) to 4 (strongly agree). Reverse items were rated conversely. There were 21 items originally, 19 of which were retained after item-analysis. Possible scores ranged from 4 to 76, with higher total scores indicating a more positive attitude. Cronbach's α for the scale was 0.83 in this study.

The contraceptive self-efficacy scale, a 20-item scale developed by Lin [16], assessed the degree of a participant's certainty about self-control over sexual and contraceptive situations. Responses were rated on a five-point scale: 0, indicating "no confidence at all"; 1, "about 20% to 30% confidence"; 2, "about 50% confidence"; 3, "about 70% to 80% confidence"; and 4, "absolute confidence". Possible scores ranged from 0 to 80, with higher total scores indicating higher contraceptive self-efficacy. Cronbach's α for the scale was 0.85 in this study.

Perception of peers' use of contraceptives was assessed using a seven-item scale developed by the authors. Responses were rated on a scale from "strongly disagree" (1) to "strongly agree" (4). Possible scores ranged from 4 to 28. Higher total scores indicated that subjects believed that their peers were more likely to use contraceptives. Cronbach's α for this scale was 0.70 in this study.

All scale items were evaluated for their content relevance and appropriateness by five researchers and practitioners in public health, nursing, sexual health education, obstetrics, and school nursing. Some scale items were revised based on their suggestions. Ten eligible female adolescents were asked to examine the revised instrument items for clarity, and unclear or ambiguous wording was modified based on the input of these adolescents.

Data analysis

Descriptive statistics including frequency and mean ± standard deviation (SD) were calculated. Chi-squared and unpaired t tests and stepwise logistic regression were used for inferential analysis. In all tests, the level of significance was set at p less than 0.05.

Results

Participants ranged between 16 and 19 years of age, with 27 (16.5%) participants aged 16, 93 (56.7%) participants aged 17, 36 (22.0%) participants aged 18, and eight (4.9%) participants aged 19. The distributions of basic data are summarized in Table 1. For consistency of contraceptive use, 15.2% (n = 25) of participants had never used contraceptives during intercourse over the preceding 6 months, 20.7% (n = 34) had used them occasionally, 9.1% (n = 15) had used them sometimes, 15.2% (n = 25) had used them frequently, and 39.6% (n = 65) had always used them. Based on the consistency of contraceptive use, female adolescents were divided into two groups: the consistent use (CU) group (n = 90, 54.9%), those who used contraceptives always or frequently, and the rare use (RU) group (n = 74, 45.1%), those who used contraceptives sometimes, occasionally, or never. The distribution of age, socioeconomic status, family structure, cigarette use, and alcohol use did not differ significantly between the two groups. Participants who had received contraceptive education in school tended to be in the CU group.

Characteristics regarding sexual history are shown in Table 2. About half (51.8%) of participants had their first sexual intercourse at 17 years of age or older, and 53.7% of participants had used contraceptives at first sexual intercourse. Thirty-three participants had had pregnancies

Table 1. Distribution of basic data in 164 sexually active female adolescents: comparison between the consistent use (CU) and rare use (RU) groups

	n (%)	RU	CU	χ^2	*p*
Age, yr				1.021	0.312
≤ 17	120 (73.2)	57	63		
≥ 18	44 (26.8)	17	27		
Socioeconomic status				1.138	0.286
Low	123 (75.0)	58	65		
Middle and above	41 (25.0)	16	25		
Family structure				3.300	0.192
Extended family	27 (16.5)	11	16		
Nuclear family	106 (64.6)	53	53		
Single-parent family	31 (18.9)	10	21		
Cigarette use				0.118	0.731
Yes	51 (31.1)	22	29		
No	113 (68.9)	52	61		
Alcohol use				0.101	0.751
Yes	38 (23.2)	18	20		
No	126 (76.8)	56	70		
Previous contraceptive education in school				3.882	0.049
Yes	100 (61.0)	39	61		
No	64 (39.0)	35	29		

and 97% ($n = 32$) of these pregnancies had ended in abortion. Almost half (45.7%) of participants were having sexual intercourse once or more per week. The age at first sexual intercourse, history of previous pregnancy, and frequency of sexual intercourse were not significantly different between the CU and RU groups. Participants who had used contraceptives at first sexual intercourse tended to be in the CU group (Table 2).

The mean score ± SD of contraceptive knowledge was 12.20 ± 4.25, of contraceptive attitude was 62.79 ± 7.10, of contraceptive self-efficacy was 50.17 ± 13.30, and of perception of peers' use of contraceptives was 19.73 ± 3.91. When compared with the maximum possible score, participants demonstrated a medium-to-high rating for contraceptive attitude and perception of peers' use of contraceptives, and only a medium rating in contraceptive knowledge and contraceptive self-efficacy. Participants in the CU group had significantly greater contraceptive knowledge, contraceptive attitude, contraceptive self-efficacy, and perception of peers' use of contraceptives than those in the RU group (Table 3).

Condoms were the most popular ($n = 84$, 51.2%) contraceptive method used, and withdrawal ($n = 39$, 23.8%) was the second most popular. The other major contraceptive methods used were vaginal irrigation ($n = 9$, 5.5%), the postcoital pill ($n = 6$, 3.7%), oral contraceptive pill on prescription ($n = 5$, 3.0%), condoms combined with the calendar method ($n = 5$, 3.0%), the calendar method combined with withdrawal ($n = 4$, 2.4%), intrauterine device ($n = 3$, 1.8%), calendar method ($n = 3$, 1.8%), contraceptive implant ($n = 2$, 1.2%), spermicide ($n = 1$, 0.6%), and other methods ($n = 3$, 1.8%).

Stepwise logistic regression analysis was used to determine which factors differentiated the CU and RU groups. The factors identified in the bivariate analysis as significantly associated with consistency of contraceptive use were considered to be predictor variables. The final regression model contained two variables that correctly classified 67.2% of the sample. Higher contraceptive attitude (odds ratio, OR, 1.148) and previous contraceptive education in school (OR, 3.394) increased the probability of being in the CU group (Table 4).

Table 2. Distribution of sexual history in 164 sexually active female adolescents: comparison between the consistent use (CU) and rare use (RU) groups

	n (%)	RU	CU	χ^2	*p*
Age at first intercourse, yr				1.959	0.375
≤ 15	36 (22.0)	19	17		
16	43 (26.2)	16	27		
≥ 17	85 (51.8)	39	46		
Contraception at first intercourse				13.573	0.000
No	76 (46.3)	46	30		
Yes	88 (53.7)	28	60		
Previous pregnancy				0.121	0.727
No	131 (79.9)	60	71		
Yes	33 (20.1)	14	19		
Frequency of sexual intercourse within last 6 months				1.891	0.756
> Once per week	37 (22.6)	19	18		
Once per week	38 (23.2)	15	23		
Once per 2 weeks	31 (18.9)	15	16		
Once per 3 weeks	17 (10.4)	6	11		
Once per month	41 (25.0)	19	22		

Discussion

In this study, around 45% of sexually active female adolescents seldom used contraceptives when they had sex. This demonstrates that it is important to improve the consistency of contraceptive use among sexually active female adolescents. American data show that the oral contraceptive pill and condoms are the most popular

Table 3. Contraceptive knowledge, contraceptive attitude, contraceptive self-efficacy, and perception of peers' use of contraceptives in 164 sexually active female adolescents: comparison between the consistent use (CU) and rare use (RU) groups

	RU (*n* = 74) Mean ± SD	CU (*n* = 90) Mean ± SD	*t*	*p*
Contraceptive knowledge	11.47 ± 4.51	12.78 ± 3.96	3.842	0.002
Contraceptive attitude	59.58 ± 6.78	65.42 ± 6.26	32.806	0.000
Contraceptive self-efficacy	46.85 ± 13.66	52.90 ± 12.42	8.798	0.003
Perception of peers' use of contraceptives	18.72 ± 3.54	20.57 ± 4.02	9.573	0.002

SD = standard deviation.

Table 4. Logistic stepwise regression analysis for contraceptive behavior in 164 sexually active female adolescents

	β	SE	*p*	OR (95% CI)
Contraceptive attitude (per 1-score increase)	0.138	0.029	0.000	1.148 (1.084–1.216)
Previous contraceptive education in school (yes/no)	1.222	0.364	0.001	3.394 (1.664–6.924)
Constant	–9.091	1.885	0.000	

Model: $\chi^2 = 40.20$, $p < 0.001$. SE = standard error; OR = odds ratio; CI = confidence interval.

contraceptives used by young women aged 15 to 19 years, used by 45% and 38%, respectively [22]. Participants in this study were more likely to use the withdrawal method and less likely to use the oral contraceptive pill than their American counterparts. These differences may result from different cultures and the availability of contraceptive services for adolescents. In Taiwan, premarital sexual intercourse is a social taboo. Adolescents may be afraid of others, especially parents, finding out that they have sought or are using contraceptives. Withdrawal does not cost anything or need any preparation, which is convenient for adolescents to practice. However, with withdrawal, the risk of pregnancy remains high. In Taiwan, many health providers neglect the issue of contraception for female adolescents, failing to provide advice on the oral contraceptive pill. Sexually active adolescents need help to use more effective contraceptive methods. Contraceptive services for adolescents are important so that adolescents can have access to the proper method for their contraception and will not increase sexual activity [23]. The policy of contraceptive services for adolescents should be supported. There was no relationship between substance use and consistency of contraceptive use, which is in accordance with a previous finding [24]. Further research may help to determine the relationship between substance use and consistency of contraceptive use. The findings of this study also do not support an association between family structure and consistency of contraceptive use. Although lack of supervision has been used to explain the reported relationship between family structure and contraception among adolescents [25], parent–daughter communication has been shown to be a family risk factor associated with adolescent pregnancy [26]. The quality of parental communication may influence adolescent contraception more than family structure. Further investigation should perhaps consider parental communication as an independent variable.

Participants using contraceptives at first sexual intercourse were more likely to be in the CU group in this study. This concurs with another study, which showed that adolescents who had not been pregnant were more likely to have used contraception for their first sexual intercourse experience than those who had become pregnant [27]. This implies that if sexual activity is planned and contraception is used at first sexual intercourse, it is more likely that adolescents will employ better contraceptive practice over their subsequent sexual life. Sex education should be provided to adolescents prior to their commencement of sexual activity, and the importance of responsible sexual behavior and contraception needs to be taught.

This finding supports the notion that participants who had become pregnant did not use contraceptives more often than those who had never been pregnant, and are therefore at risk of repeated pregnancies. Frequency of sexual intercourse is significantly associated with pregnancy [28]; participants who had sexual intercourse more frequently were not more likely to be in the CU group than those engaged in less frequent sexual intercourse in this study. These results imply that health care providers should teach female adolescents who have been pregnant or who engage more frequently in sexual intercourse about their vulnerability to pregnancy and so increase their contraceptive efforts. Understanding the reasons why these adolescents fail to practice safe sex merits further study.

Participants with more positive perceptions of peers' use of contraceptives were more likely to be in the CU group. This result is consistent with another study that showed peers' behavior to be a powerful factor influencing the contraceptive use of sexually active female adolescents [29]. When contraceptive use becomes a social norm, female adolescents may be encouraged to use contraception when having sex. Peer group education programs can be an effective tool by which peer values regarding contraception may be transmitted to adolescents.

Interestingly, all participants only demonstrated a medium level of contraceptive knowledge and contraceptive self-efficacy, even though they were sexually active. This means that sexually active female adolescents are not equipped with sufficient knowledge and skills to succeed in their contraceptive practice. A well-designed education program for sexually active female adolescents to improve their contraceptive knowledge and contraceptive self-efficacy is needed. Contraceptive attitude was more important than knowledge and self-efficacy as a determinant of contraceptive use in this sample. Health care providers need to discuss beliefs regarding contraception with sexually active female adolescents and address beliefs that may be incorrect. Previous contraceptive education in school was shown to be important for female adolescents to practice contraception consistently in this study. However, as there remains a fear that contraceptive education will encourage adolescents to have sex, there are still some arguments about whether contraceptive education should be included in sex education in schools. Many adolescents obtained contraceptive information, often inaccurate, through peers and the media. The authors can unequivocally state that school education courses should cover contraceptive education. Contraceptive attitude and previous contra-

ceptive education in school correctly classified 67.2% of participants. More research needs to be carried out to find other correlates for consistency of contraceptive use among sexually active female adolescents.

Many female adolescents may keep their sexual experiences secret, and accessing this special group is a challenge for health care providers. Health care professionals should take the initiative to actively communicate with female adolescents about their sexual activity and contraceptive use. The results of this study could provide some profiles about consistency of contraceptive use among sexually active female adolescents in Taiwan. Since males have more power in the traditional sexual relationship [30], it is important to understand the role of partners in the decision-making process for consistency of contraceptive use among female adolescents in the future. Although the questionnaires were anonymous, self-reporting of data may have limited the results. However, such effects were minimized because great care was taken to assure respondents of the confidentiality of collected information and privacy during data collection. As this was a cross-sectional study, causality could not be inferred. A study employing a longitudinal design would be necessary to assess the significance and stability of correlates for consistency of contraceptive use. In addition, an experimental study that applies intervention might validate the findings of the study and provide more information. In Taiwan, the fertility rates of 15- to 19-year-old women have not changed significantly, remaining between 13/1,000 and 14/1,000 in the last 5 years. Although the data of this study were collected in 1999, the study results are still useful to health care professionals to design effective strategies to prevent adolescent pregnancy.

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性活躍青少女持續避孕相關因素的探討

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本研究目的為探討高雄市性活躍青少女持續避孕的相關因素，以高雄市兩所高職學校共 164 位最近六個月有性活動且未懷孕之青少女為研究對象。採用匿名式問卷測量研究對象基本資料、避孕知識、避孕態度、避孕自我效能、感受同儕避孕行為、性行為史及避孕行為。研究結果顯示：性活躍青少女中有 45.8% 性活動次數為每週至少一次，有 39.6% 為每次皆避孕，但有 15.2% 從未使用避孕。保險套 (51.2%) 為其最常使用的避孕方法，其次為體外射精 (23.8%)。以逐步對數複迴歸統計發現，避孕態度 (對比值：1.148) 及過去有在學校接受過避孕衛教 (對比值：3.394) 之性活躍青少女較能歸類為持續避孕組，有 67.2% 的研究對象可被正確歸類其組別。本研究結果可提供衛生單位擬定避免青少女懷孕政策之參考，並建議學校衛生教育應納入避孕衛教。

關鍵詞：性活躍青少女、持續避孕

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