ORIGINAL RESEARCH

Psychosocial correlates of condom usage in a developing country

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Abstract: This study examines the psychosocial factors accounting for condom usage during the last sexual episode for males, females, and the general population aged 15–49 years, and the psychosocial factors accounting for frequency of condom usage in Jamaica. Logistic regression models were estimated using data collected in 2004 by the Jamaica Ministry of Health. Sixty-nine percent of the sample indicated that they had used a condom in the past, but only 31% reported that they had always used a condom in the previous 12 months, compared with 16.5% who reported "most times", 21.4% who reported "sometimes", and 31% who reported "never". Five variables emerged as statistically significant factors for the last time males used a condom ($\chi^2 = 128.76$, $P < 0.001$), four variables for females ($\chi^2 = 75.45$, $P < 0.001$), and five variables for the general population ($\chi^2 = 200.84$, $P < 0.001$). The three most significant factors which correlated with frequency of condom usage in the previous 12 months with a current partner, in descending order, were condom usage during the first act of sexual intercourse with a current sexual partner, self-efficacy, and marital status. These findings are discussed within the general context of understanding condom usage, frequency of condom usage among Jamaicans, and how these can aid public health intervention programs.

Keywords: condom use, sexual behavior, psychosocial factors, public health

Introduction

This study examines the use of condoms among Jamaicans. In the 1960s, the total fertility rate in Jamaica was 6.2 children per woman.[1] During the 1970s, the introduction of family planning and contraceptive methods in Latin America and in the Caribbean saw a reduction in the general fertility rate in Jamaica to 4.3 children per woman. By 1999 the rate was 2.8 children per woman, and, in 2007, the rate had decreased further to 2.4.[1–3] Jamaica is not atypical in the reduction of its total fertility rate because this is also the case in the Caribbean and in the rest of the world.[4,5] Globally, although the total fertility rate has been falling, the data reveal that it is averaging 5.2 children per woman in the least developed countries, and in excess of 5.5 children per woman in Eastern, Western, and Middle Africa.[5] Contraceptive methods, including the condom, the oral contraceptive pill, and injection are responsible for the exponential decline in total fertility in Jamaica,[1–3] Latin America and the Caribbean,[6–10] and internationally.[11] Family planning and contraceptive methods, coupled with improvements in sanitary and public health interventions, are also responsible for the demographic transition towards ageing of many societies in the developing world. In Jamaica, contraceptive prevalence has increased from 38% in 1975–76 to 64% in 1997, and 69% in 2007.[2,12] In spite of wide access to contraceptive methods such as the condom, developing

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countries, in particular Africa and the Caribbean, have seen widespread increases in human immunodeficiency virus (HIV), acquired immunodeficiency syndrome (AIDS), and/or other sexually transmitted infections (STIs), as well as in adolescent pregnancy,[12–15] all of which highlight infrequency of condom usage in these societies.

In response to public health concern about adolescent sexual behavior, increased HIV rates in this cohort, as well as high promiscuity and fertility, some societies have used an abstinence campaign on radio to address current premarital sexuality. There is a topical debate which looks at whether or not adolescents should be provided with condoms and other forms of contraception. While the discourse sometimes takes a moral trajectory, the designers and debaters are older than the cohort who are engaged in the various sexual acts, and have missed the sexual reality of adolescents.[16,17] Hence, withholding methods of contraception from adolescents or making them feel embarrassed asking about or purchasing contraceptives will not make them cease their premarital sexual behavior, reduce rates of unwanted pregnancy, decrease rates of STIs including HIV and/or AIDs, and will definitely not influence them to get married and abstain from sex based on the morals of the older generations. One study highlights the sociosexual reality of contemporary society. The author found that in Jamaica "… the birth of a child decreases the probability of a transition to more stable unions and at the same time decreases the probability of a partnership terminating for women whose first union was a visiting one".[18] This finding emphasizes that some sexually active adolescents will use neither a traditional contraceptive method nor a modern one.[19]

HIV and AIDS infections mostly occur through sexual transmission,[20] which means infrequent condom usage during sexual relations. Therefore, if people do not like condoms, there is a high probability that they will forego regular condom use, despite the risk of sexually transmitted infections. Research evidence shows that latex condoms are highly protective against contracting HIV.[21,22] These findings suggest that the increase in HIV, AIDS, and other STIs in developing nations is attributable to low, infrequent, or improper condom usage. It should be noted that unwillingness to sell condoms and other contraceptives to adolescents is only exacerbating the high prevalence of STIs, unwanted pregnancies, and deaths as a result of these infections. Condom usage therefore is an important measure in preventing the spread of HIV, AIDS, and other STIs.[23] The aforegoing means that the suitability of condoms[24–28] must be widely accepted, if public health intervention is to be effective in increasing the proper usage of condoms during sexual intercourse.

The proper use of a condom is based on fit, preference, and knowledge. These factors also influence whether or not men use a condom at all during sexual intercourse. Within the context of patriarchy, the male partner is able to dictate the method of contraception, and this decision-making power[29] is among the reasons for the increase in STIs (including HIV and AIDS) in spite of the increasing use of contraceptives since the 1970s. Therefore, in order for public health programs to foster an increase in the use of modern contraceptive methods, a multifaceted intervention is needed, and should include access to youth-friendly services and education on the use of contraceptives, life skills, and information in a cultural context that meets people's needs.

Clearly there is evidence to support the fact that condom usage is inconsistently utilized among different groups in many nations. In the current study, using 2004 data, we found that 54.4% of Jamaicans aged 15–49 years always use a condom, compared with 23.8% in Dominica based on 2007 data.[30] George et al[30] found in his sample of high-school girls in Dominica (controlling for age), that sexual coercion and parents owning a vehicle were statistically correlated with inconsistent condom use. Another study in Western Nigeria[31] found that gender, age, monthly family income, age at first act of sexual intercourse, and nonaccepting attitudes towards recreational sex were correlates of inconsistent use of condoms. Norman[32] found in his data from Kenya, Tanzania, Trinidad and Tobago, that only 19% of participants reported that they consistently used a condom. In addition, factors associated with consistent condom use were most recent sex partner, gender, study site, perceived difficulty in requesting condom use, and requesting that a condom be used. Another study in Mexico[33] found that age, educational level, socioeconomic status, and type of sexual partners (occasional and regular) were related to condom use in a statistically significant manner.

In a study using a sample of 212 respondents who had STIs and were attending clinics in Montego Bay, Jamaica, Nnedu et al[34] found that 43% reported that they used a condom during their last sexual intercourse. It was also found that employment status, greater knowledge of STIs, multiple sexual partners, and belonging to a religious organization were significantly correlated with last condom usage. A review of the literature on condom use has revealed a plethora of factors to be associated with consistent, inconsistent, and general condom use. However, all the studies used gender as an independent variable, and none examined the psychosocial variables that influenced use of condoms among males and females, and the factors which account for the frequency of use of condoms.

Therefore, the objectives of the current study were to investigate the psychosocial factors which explain condom usage during the last sexual episode for males, females, and overall population aged 15–49 years, as well as the psychosocial factors accounting for frequency of condom use.

Methods
Sample
The study population comprised people aged 15–49 years who resided in Jamaica at the time of the survey in May–August 2004. The population data for this research were collected by Hope Enterprises Limited on behalf of the Jamaican Ministry of Health.[35] A multistaged sampling design was used to collect the data. The 14 parishes in Jamaica were stratified into constituencies, with each constituency stratified into three sections, ie, rural areas, parish capitals (urban areas), and main towns (semiurban areas). The areas which comprised a constituency were then stratified into primary sampling units or enumeration districts (EDs).

A random sample of each primary sampling unit was then selected based on probability proportional to size. Seventy-two EDs were selected for the study, comprising 23 EDs in urban areas, 25 EDs in semiurban areas, and 24 EDs in rural areas. Twenty-five households were systematically chosen from each ED, and cluster sampling was carried out for all the people living in the household of the designated ages being interviewed for the survey.

Data sources
A questionnaire was used to collect the data from respondents. Face-to-face interviews, conducted by trained interviewers, were used to collect the information. Interviewer training took five days, of which two days were devoted to field practices. Interviewers were assigned to a team of two females, two males, and a supervisor. Verbal consent was sought and given before the actual interview commenced. Interviewees were informed of confidentiality and their right to stop the interview at any time. No names, addresses, or other personal information were collected from respondents, in order to ensure anonymity and confidentiality. The instrument employed in the survey utilized indicator measures and definitions consistent with the Joint United Nations Program on HIV/AIDS and the United States Agency for International Development priority prevention indicator.

Statistical analysis
Data were entered, stored, and retrieved using SPSS for Windows (Version 16.0; SPSS Inc., Chicago, IL). Descriptive statistics were performed on particular sociodemographic characteristics of the sample. Multivariate logistic regressions were fitted using one outcome measure, eg, self-reported, confirmed positive HIV test results. We examined correlation matrices to determine multicollinearity. Where collinearity existed ($r > 0.7$), variables were entered independently into the model to determine those that should be retained during the final model construction.[35] To derive accurate tests of statistical significance, we used SUDDAN statistical software (Research Triangle Institute, Research Triangle Park, NC), and this was adjusted for the survey's complex sampling design. A P value < 0.05 (two-tailed) was used to establish statistical significance.

Analytic model
For this study, the analytic models used accommodated multiple independent variables on a single binary dependent variable, ie, condom usage during the last sexual episode for males, condom usage the last time females had sexual intercourse, and condom usage the last time the general population had sexual intercourse. Using logistic regression,[34] this paper tested variables identified in the literature, as well as adding some new ones. The current work tests condom usage the last time males had sexual intercourse (equation 1.1), condom usage the last time females had sexual intercourse (equation 2.1), condom usage the last time the general population had sexual intercourse (equation 3.1), and frequency of condom usage (equation 4.1) as follows:

$$C_{mi(t+1)} = f(A_i, ED_i, E_i, MS_i, C_{ti}, SI_i, N_i, AS_i, L_i, CU_i, K_i, W_i, F_i, P_i, T_i, STI_i, R_i, Q_i) \qquad [1.1]$$

$$C_{fi(t+1)} = f(A_i, ED_i, E_i, MS_i, C_{ti}, SI_i, N_i, AS_i, L_i, CU_i, K_i, W_i, F_i, P_i, T_i, STI_i, R_i, Q_i) \qquad [2.1]$$

$$C_{(t+1)i} = f(A_i, X_i, ED_i, E_i, MS_i, C_{ti}, SL_i, N_i, AS_i, L_i, CU_i, K_i, W_i, F_i, P_i, T_i, STI_i, R_i, Q_i) \qquad [3.1]$$

$$C_i = f(A_i, X_i, ED_i, E_i, MS_i, C_{ti}, SL_i, N_i, AS_i, L_i, CU_i, K_i, W_i, F_i, P_i, T_i, STI_i, R_i, Q_i) \qquad [4.1]$$

where $C_{mi(t+1)}$ denotes the male having used a condom the last time he had sexual intercourse with a current partner, $C_{fi(t+1)}$ represents the female partner using a condom the last time she had sexual intercourse with a current partner, and $C_{(t+1)i}$ denotes having used a condom the last time individual i had sexual intercourse with a current partner. C_i is frequency of condom use in the last 12 months for individual i with a current sexual partner, A_i is age of individual i, ED_i represents educational level of individual i, U_i means occupation of individual i, AS_i is having sex with a commercial

sex worker for individual i, AR_i indicates area of residence of individual i, P_i denotes currently having sexual relations with a commercial sex worker for individual i, MS_i is marital status of individual i, X_i is gender of respondent i, C_{ti} means having used a condom the first time with the current sexual partner for individual i, SL_i is age of first sexual intercourse of individual i, S_i means that individual i indicated that his/her sexual partner has other sexual partner(s), N_i is number of sexual partners of individual i in the last 12 months, R_i denotes actively practising religion of individual i, K_i is individual i having had a STI, W_i represents self-efficacy of individual i, Q_i denotes individual's i chance of contracting HIV, and ε_i is the model's error term.

Using logistic regression to test the hypotheses, the data showed that the following are explanatory variables which account for each dependent variable. These are written as equations 1.2, 2.2, 3.2, and 4.2.

$$C_{mi(t+1)} = f(MS_i, C_{ti}, S_i, N_i, W_i) \quad [1.2]$$

$$C_{fi(t+1)} = f(MS_i, C_{ti}, S_i, W_i) \quad [2.2]$$

$$C_{(t+1)i} = f(MS_i, C_{ti}, S_i, N_i, W_i) \quad [3.2]$$

$$C_i = f(C_{ti}, S_i, W_i, AS_i, MS_i, X_i) \quad [4.2]$$

Measures

Professional respondents were classified into three groups, ie, upper professionals (eg, chief executive officers, lawyers, doctors, and architects), middle professionals (eg, nurses, teachers, police officers, secretaries, and accountants), and lower occupations (eg, laborers, taxi operators, machine operators, domestic workers, and cosmetologists). Self-efficacy denotes measures which are instituted by an individual to protect himself or herself from danger, threat, or harm. This variable was measured using the following questions: "What did you do to avoid pregnancy?", "The last time you had sex, did you or (your) partner do anything to delay or avoid pregnancy?", "Whose idea was it to use a condom?", using two response choices (myself = 1, other = 0) and "Do you think your partner would be upset if he/she found that you had a condom available?" and "Do you do anything to protect yourself from contracting HIV?"

Contraceptive method used was determined from the question "Are you and your partner currently using a method of contraception?" If the answer was yes, the interviewee was then asked "Which method of contraception do you use?" Condom use was determined from the question "Did you use a condom the last time or the first time you had sexual intercourse with your partner?" (1 = yes, 0 = no). Marital status was determined from the following questions "Are you legally married now?", "Are you living with a common-law partner now? (that is, are you living as man and wife now with a partner to whom you are not legally married?)", "Do you have a visiting partner, that is, a more or less steady partner with whom you have sexual relations?" or "Are you currently single?" Subjective social class was measured from "In which class do you belong?" The options were lower, middle, or upper social hierarchy.

Results
Demographic characteristics

Table 1 presents the sociodemographic characteristics of the sample which consisted of 1800 participants (males, 48.8%). Sixty-nine percent of the participants indicated that they had used a condom in the past. However, only 31% reported that they "always" used a condom with their recent partner (in the previous 12 months) compared with 16.5% who said "most times", 21.4% who mentioned "sometimes", and 31% who stated "never". Comparatively, 47.5% mentioned that they "always" used a condom with their partner just before the most recent one (in the previous 12 months), 14.0% said "most times", and 11.5% indicated "sometimes". With respect to the third most recent partner (in the previous 12 months), 54.4% said that they "always" used a condom, 12.9% indicated "most times", 9.2% reported "sometimes", and 23.5% mentioned "never".

Almost 18% of the participants reported having had STIs (males 22.7%, females 12.3%, $\chi^2 = 29.635$, $P < 0.0001$), and only 13.3% had had an HIV test (males 15.1%, females 12.3%, $\chi^2 = 0.900$, $P = 0.366$). Seventy-eight percent of participants indicated that they would be willing to do an HIV test in the future (males 79.3%, females 76.4%, $\chi^2 = 1.349$, $P = 0.245$).

The mean age at first sexual relations for the sample was 15.4 (± SD 3.2) years. Age at first sexual intercourse was 16.7 (± SD 2.7) years for females and 14.1 (± SD 3.2) years for males (Student's t-test 16.4, $P < 0.0001$).

When the participants were asked "What is your chance of catching HIV?", 52.8% indicated "no chance", 33.8% mentioned "little chance", 6.9% said "moderate chance", 6.4% remarked a "good chance", and 0.1% said they "already had" the virus.

Multivariate analyses

Table 2 presents information on possible factors which account for using a condom the last time one had sexual intercourse with a partner based on gender and population. Using logistic regression analyses, five variables emerged as

Table 1 Sociodemographic characteristics of sample (n = 1800)

Characteristic	n (%)
Gender	
Male	878 (48.8)
Female	920 (51.2)
Educational level	
Primary or below	51 (2.8)
Secondary	1546 (85.9)
Tertiary	203 (11.3)
Employment status	
Full time	626 (34.8)
Part time	201 (11.1)
Unemployed	563 (31.3)
Student	410 (22.8)
Union status	
Married/common-law	561 (31.2)
Visiting	619 (34.4)
Single	619 (34.4)
Ever had sexual relations	
Vaginal	1543 (85.7)
Anal	1 (0.1)
Both	14 (0.8)
No	242 (13.5)
Number of sexual partners	
Last 4 weeks median (range)	1 (0.17)
Last 3 months median (range)	1 (0.30)
Last 12 months median (range)	1 (0.100)
More than 12 months median (range)	1 (0.24)
Condom usage on first sexual relations (with current partner)	
Yes	1042 (57.9)
No	454 (25.2)
Nonresponse	304 (16.9)
Condom usage (during the last sexual episode)	
Yes	718 (39.9)
No	792 (44.0)
Nonresponse	290 (16.1)
Sexual relations with a commercial partner (ever had)	
Yes	89 (5.6)
No	1498 (94.4)
Length of time living in community median (range)	7.5 years (0.40)
Age, mean (SD)	28.3 years (11.1 years)
Age of first sexual relations, mean (SD)	15.4 years (3.2 years)

statistically significant factors for the last time males used a condom (χ^2 [14] = 128.76, $P < 0.001$), four variables for females (χ^2 [13] = 75.45, $P < 0.001$), and five variables for the last time the general population used a condom (χ^2 [14] = 200.84, $P < 0.001$).

The general model (population) had statistically significant predictive power (model χ^2 = 200.84, $P < 0.0001$; Hosmer–Lemeshow Goodness-of-Fit χ^2 = 5.428, $P = 0.711$) and correctly classified 79.1% of the sample. The explanatory variables (condom usage at first sexual intercourse of individual i, sexual partner of individual i having other sexual partner(s), self-efficacy of individual i, number of sexual partners of individual i in last 12 months, and marital status of individual i) account for 49.8% of condom usage the last time the participants had sexual intercourse with their current partner (Table 2).

The male model had statistically significant predictive power (model χ^2 = 128.76, $P < 0.001$; Hosmer–Lemeshow Goodness-of-Fit Test, χ^2 = 4.35, $P = 0.83$), and correctly classified 76.8% of the sample. The explanatory variables (condom usage the first time the participants had sexual intercourse with a current partner, partner of male i having other sexual partner(s), self-efficacy of male i, number of sexual partners male i had had in the previous 12 months, marital status of male i) account for 50.3% of condom usage of males for last episode of sexual intercourse (Table 2).

The female model had statistically significant predictive power (model χ^2 = 75.45, $P < 0.001$; Hosmer–Lemeshow Goodness-of-Fit Test, χ^2 = 2.95, $P = 0.937$), and correctly classified 79.3% of the sample. The explanatory variables (condom usage the first time the participants had sexual intercourse with a current partner, partner of female i having other sexual partner(s), and self-efficacy of female i, marital status of female i) account for 51.4% of condom usage of females at last episode of sexual intercourse (Table 2).

Using logistic regression analyses, six variables emerged as statistically significant predictors of frequency of condom usage in the previous 12 months with a current partner (Table 3). These were self-efficacy, partner with partner, first time condom usage with current partner, commercial sex worker, marital status, and gender.

The model (frequency of condom usage in the previous 12 months with a current partner) had statistically significant predictive power (model χ^2 = 115.34, $P < 0.001$; Hosmer–Lemeshow Goodness-of-Fit Test, χ^2 = 5.348, $P = 0.720$), and correctly classified 78.2% of the sample. Furthermore, the three most significant factors correlating with frequency of condom usage in the previous 12 months with a current partner, in descending order, are condom usage during the first sexual encounter with current partner, self-efficacy, and marital status (married) (Table 3). Jamaicans aged 15–49 years who were married were 66% less likely to use a condom frequently with their current partners ("most times" to "always").

Discussion
The current study investigated the reasons for condom use among Jamaicans. The findings indicated that 31 of every

Table 2 Logistic regression analyses of variables for condom usage during the last sexual episode for males, females and the Jamaican population

Characteristic	Male[1]		Female[2]		Population[3]	
	OR	CI (95%)	OR	CI (95%)	OR	CI (95%)
Condom usage (first time had sex)	4.27***	1.76–10.40	3.61**	1.31–9.97	4.19***	2.17–8.07
Partner having other partner	6.36***	2.5–16.14	5.22***	1.93–14.08	5.35***	2.81–10.20
Self-efficacy	26.53***	7.13–98.68	33.64***	4.20–269.62	26.84***	9.11–79.04
Chance of contracting HIV						
Little chance	1.01	0.51–2.00	0.58	0.21–1.63	0.93	0.54–1.62
Moderate chance	1.04	0.32–3.36	1.23	0.25–6.16	1.15	0.46–2.89
Good change	0.65	0.18–2.36	0.40	0.06–2.88	0.70	0.25–1.99
No change (reference group)	1.00		1.00		1.00	
Upper professionals	0.35	0.06–1.96	1.93	0.18–20.96	0.66	0.17–2.64
Middle professionals	0.85	0.44–1.62	0.88	0.48–1.63	0.73	0.48–1.13
Lower professional (reference group)	1.00		1.00		1.00	
Age of respondents	1.00	0.96–1.04	0.98	0.93–1.03	0.99	0.96–1.02
Age at first sexual intercourse	0.91	0.82–1.02	1.14	0.94–1.37	0.97	0.88–1.06
Male					1.70	0.88–3.21
Persons had sex within previous 12 months (n)	1.05*	1.01–1.09	1.20	0.82–1.76	1.10*	1.04–1.15
Actively practising religion (1 = yes)	1.41	0.74–2.71	1.80	0.68–4.75	1.41	0.84–2.38
Had sexually transmitted infections	0.73	0.37–1.44	0.75	0.18–3.10	0.77	0.43–1.39
Sex with commercial worker	1.54	1.32–5.26	4.88	0.51–47.12	1.58	0.61–4.08
Union status						
Visiting relationship	2.63**	1.81–3.56	1.54	0.55–4.34	2.05*	1.18–3.56
Married	0.21***	0.15–0.29	0.20***	0.14–0.28***	0.20***	0.14–0.28
Single (reference group)	1.00		1.00		1.00	
Tertiary education	2.39	0.68–8.45	2.22	0.51–9.64	2.48	0.70–8.73
Secondary education	1.84	0.62–5.60	1.46	0.39–5.62	1.92	0.64–5.74
Primary education (reference group)	1.00		1.00		1.00	

Notes: [1]Model chi-square (14) = 128.76, $P < 0.001$; −2 log likelihood = 244.75; Nagelkerke r-squared = 0.503. Hosmer–Lemeshow Goodness-of-Fit Test, $\chi^2 = 4.35$, $P = 0.83$; overall correct classification = 76.8%, correct classification of cases of condom usage at first sexual intercourse = 71.7%, correct classification of cases of not using condom at first sexual intercourse = 80.4%. *$P < 0.05$; **$P < 0.01$; ***$P < 0.001$; [2]Model chi-square (13) = 75.45, $P < 0.001$;−2 log likelihood = 128.07; Nagelkerke r-squared = 0.514; Hosmer–Lemeshow Goodness-of-Fit Test, $\chi^2 = 2.95$, $P = 0.937$; overall correct classification = 79.3%; correct classification of cases of condom usage at first sexual intercourse = 55.1%, correct classification of cases of not using condom at first sexual intercourse = 89.2%. *$P < 0.05$; **$P < 0.01$; ***$P < 0.001$; [3]Model chi-square (14) = 200.84, $P < 0.001$; −2 log likelihood = 381.84; Nagelkerke r-squared = 0.498; Hosmer–Lemeshow Goodness-of-Fit Test, $\chi^2 = 3.94$, $P = 0.86$; overall correct classification = 77.9%; correct classification of cases of condom usage at first sexual intercourse = 67.3%; correct classification of cases of not using condom at first sexual intercourse = 84.0%.
Abbreviations: CI, confidence interval; HIV, human immunodeficiency virus; OR, odds ratio.

100 Jamaicans aged 15–49 years consistently used a condom, 69 of every 100 inconsistently used a condom, 31 of every 100 had never used a condom, 58 of every 100 used a condom the first time with their current sexual partner, and 40 of every 100 used a condom the most recent time with their current partner.

The findings suggest that a large number of Jamaicans do not use a condom or are inconsistent in their use of condoms during sexual intercourse. This revelation must be a cause for concern among public health officials, given the thrust to reduce HIV infections in Jamaica in particular, and in the Caribbean in general. Most of the factors accounting for why males used a condom the last time during sexual intercourse were the same as for females, with the exception of the number of sexual partners. The findings reveal that self-efficacy, one partner having other partners, and condom use the first time the participants had sexual intercourse with current partner, emerged as the principal factors which account for

condom use the last time an individual had sexual relations, as well as the frequency of condom use.

Males were 2.4 times more likely to use a condom consistently than were females, and married Jamaicans aged 15–49 years were 64% less likely to use a condom consistently compared with those who were never married, and married males were more likely to use a condom the last time than were married females with their spouses. One of the findings which was consistent across the different cohorts was that using a condom the first time with one's partner was the most significant predictor of condom use the last time an individual had sexual intercourse with that current partner. Males were primarily the ones who were having sexual relations with commercial sex workers, but condom use became significant with the frequency of sexual intercourse with these workers, and not merely having sexual relations with them. The fact that condoms are being used with commercial sex workers is an important finding, because these workers face the greatest

Table 3 Binary logistic regression analyses of frequency of condom usage in previous 12 months with current partner

Variable	β coefficient	Wald statistic	OR	CI (95%)
Self-efficacy	1.26	10.22	3.53***	1.63–7.66
Partner having other partner	0.79	5.08	2.20*	1.11–4.38
Condom usage – (first time had sex)	1.88	20.11	6.57***	2.89–14.97
Age at first sexual intercourse	0.08	1.65	1.08	0.96–1.21
Age of respondents	−0.03	1.73	0.98	0.94–1.01
Persons had sex with in previous 12 months (n)	0.01	0.04	1.01	0.91–1.12
Male	0.87	5.50	2.39*	1.15–4.95
Had STI (in the past)	−0.05	0.02	0.95	0.43–2.09
Actively practising religion (1 = yes)	0.31	0.92	1.37	0.7–2.58
Sex with commercial sex worker (1 = yes)	2.28	3.99	9.73*	1.04–90.61
HIV (1 = yes)	−0.14	0.11	0.87	0.37–2.06
Tertiary	−1.73	1.53	0.18	0.01–2.74
Secondary	−2.18	2.54	0.11	0.01–1.65
Primary or below (reference group)			1.00	
Visiting union	0.01	0.00	1.01	0.41–2.47
Married	−1.07	4.66	0.34*	0.13–0.91
Single (reference group)			1.00	
Little chance of contracting HIV	0.22	0.41	1.25	0.64–2.43
Moderate chance of contracting HIV	−0.18	0.07	0.84	0.23–3.02
Good chance of contracting HIV	0.93	2.47	2.53	0.79–8.08
No chance (reference group)			1.00	

Notes: Model chi-square = 115.34, $P < 0.001$; −2 log likelihood = 277.19; Nagelkerke r-squared = 0.441; Hosmer–Lemeshow Goodness-of-Fit Test, $\chi^2 = 5.348$, $P = 0.72$; overall correct classification = 78.2%; correct classification of cases of frequent condom usage with current sexual partner = 67.8%; correct classification of cases of nonfrequent condom usage with current sexual partner = 84.8%. $*P < 0.05$; $**P < 0.01$; $***P < 0.001$.
Abbreviations: CI, confidence interval; HIV, human immunodeficiency virus; OR, odds ratio; STI, sexually transmitted infection.

risk of contracting HIV and other STIs as well as transmitting them, because they earn their living by having sex with many people. The targeting of commercial sex workers is a critically important strategy to reduce HIV infection and transmission. However, the fact that it was the frequency of sexual intercourse with commercial sex workers rather than just having sex, which determined condom use, means that men who have sex infrequently or on an impromptu basis with commercial sex workers do not wear a condom.

The literature identifies age, educational level, socioeconomic status, income, and age at first sexual intercourse as being significant factors which account for condom use,[30–33] but this was not the case in the current study. None of the aforementioned variables explained condom use the last time for males, females, or the population of Jamaica. These findings point to common factors that cut across age, level of education, socioeconomic status and income, which suggest cultural influences of condom use. The current work concurs with that of Norman[30] showing that consistent condom use was based on gender and self-efficacy. However, our work goes further in that it shows that marital status, sexual intercourse with a commercial sex worker, and whether one's sexual partner had other partners, determined consistent condom use. Our work also adds to the existing literature by showing the magnitude of each determinant of consistent condom use.

Unlike other studies which have used a piecemeal approach to examination of condom use, the current study provides information on condom use the last time one had sexual intercourse for males, females, and the general population, as well as consistency of condom use. Clearly, condom use "all the time" or "most times" in sexual intercourse is determined primarily by the same factor (condom use the first time with the current partner) as is the case for condom use the last time one had sexual relations with a current partner. Embedded in this work is an explanation of why inconsistent condom use the first time is highly correlated with low use thereafter, and how inconsistent condom use increases with the stability of a sexual union. It is possible that participants believed that, having not caught an STI after the first act of sexual intercourse without using a condom, it was safe to continue having unprotected sex with the current partner. In addition, it is possible that participants also believe that the establishment of a steady union does not require safe sexual practices, because it is expected that one's partner remains faithful to the union. If these explanations are correct, there is cause for concern because some of the participants reported having multiple sexual partners.

The desire to survive accounts for peoples' willingness to protect themselves, which justifies the critical role that self-efficacy plays in consistent condom use in Jamaica.

Within the context of the preservation of life, the crucial question arises as to the determinants of gender differences in consistent condom use? Males in this study were twice as consistent in using a condom than females, which concurs with the literature.[31] The answer lies in the veto powers that males have over family planning, contraceptive methods, and condom use,[29] because of their economic supremacy over women. Another explanation is embodied in sociocultural and gender roles, as well as sexual behaviors learned before adulthood.[36–38] It is this reality that public health specialists must be cognizant of when attempting to understand sexual behavior and the behavior, in particular that of youths, adolescents, and females. Therefore, it is not sufficient to educate the population about the importance of condom use, but also how patriarchy, subordination of women, gender roles, and socialization practices influence the spread of STIs. Public health specialists must seek answers in the Jamaican culture if they want to succeed in their efforts.

The lower rate of condom use among females partly explains the elevated number of unwanted pregnancies, STIs (including HIV and/or AIDS), unsafe sex, and the high level of school dropouts among this cohort in developing nations, including Jamaica. Another aspect which cannot be omitted from this discourse is the presumption that condom use indicates a lack of love between partners, and this extends beyond Jamaica.[39] It is this misrepresentation of cultural information that accounts for the risky sexual practices of many teenagers. The current study shows that age at first sexual intercourse was 15.4 years for Jamaicans, indicating a need to make contraceptives more freely available to adolescents. Young people in Jamaica are not atypical in engaging in unprotected and premarital sexual relationships, given that this phenomenon is also found in Thailand,[40,41] Indonesia,[16] the wider Caribbean,[7–9,15,42] Uganda, Kenya, Zimbabwe, and other African nations,[12–14,43,44] as well as some Latin American countries.[45] According to Crawford et al,[46] 80% of pregnancies among adolescents were unwanted, and 40% of women in Jamaica were pregnant before the age of 20 years. These findings point to the need to distribute condoms in schools. This controversial suggestion should be taken seriously because it is not the availability of condoms that makes adolescents have sex, but their psychobiologic drives, and the cultural values and boundaries that they have internalized about sex.

In their 2007 study using a sample of 2848 Jamaicans aged 15–74 years, Wilks et al reported that 60% of students indicated that they had had sexual intercourse.[47] Disaggregating condom use by age cohort, they found that 52% of Jamaicans aged 15–24 years used a condom (males 66%, females 37%).[47] Furthermore,

Wilks et al showed that 44.3% of students had had one or more sexual partners, with 24.6% having two or more sexual partners, and 46% having engaged in sexual intercourse in the previous four weeks. Another study[48] which used a sample of 7168 Jamaicans aged 15–49 years, found that 45.9% had had sexual intercourse before 19 years of age, and 76.9% had had sexual relations before the age of 20 years. Studies have been reported for Nigeria, where even young people in higher learning institutes are involved in risky sexual behaviour.[49–51] These findings indicate that condom use among people in developing countries is similar. Therefore, without international consultations, collaborations, and sharing of best practices dealing with improving condom use and other modern contraceptive methods for young people, there will be an even greater global increase than we are now experiencing now in transmission of STIs.

The current work highlights some similarities and dissimilarities among males, females, and the general population with regard to condom use (the last time one had sexual intercourse) in Jamaica. Condom use (the first time one had sexual relations) with a partner, one's partner having had another partner/other partners, self-efficacy, and being married, were statistically significant factors for condom use (the last time one had sexual relations) across the sexes. Self-efficacy, therefore, had a stronger association with condom use (the last time one had sexual intercourse) for females than males. This suggests that females who have a greater desire to protect themselves from HIV, AIDS, pregnancy, and STIs in general were significantly more likely to have their partners use a condom than were males. However, males were more likely to use a condom than their female counterparts, indicating that material supremacy for males gives them vetoing powers over condom usage compared with females, and this accounts for some of the condom usage differences between the sexes. It is this economic supremacy that justifies the male partner's ability to dictate the determination of a method of contraception, because economically disadvantaged females will say that the males are the bread winners, and so embodied in reality is their relinquishing of contraception decisions to their partners.[29] It is this fact that accounts for males opining that they are more likely to use a condom than females, who are cognizant that their partners have another partner/other partners, indicating that even in the face of a sexually risky environment, economically vulnerable females will be unable to stipulate that their male partner use a condom, unlike males in similar social milieus.

The aforementioned issue is further reinforced by the finding that males who have multiple partners are more likely to use a condom, and the same was not found among

females. Money, therefore, makes a difference to the health status of a population, accounting for nutritional intake, a particular sociophysical milieu, water and food quality, as well as lifestyle choices.[52] In 2007, statistics for Jamaica showed that 59 of every 100 persons in the poorest 20% indicated having an illness compared with 54 of every 100 in the wealthiest 20%.[53] It is this same income inequality between the sexes that accounts for the choices of condom use or nonuse amongst males and females in Jamaica. Again the point is made, but it is reinforced in the findings that males who are involved in visiting unions are more likely to have used a condom the last time, while this is not the same for females in such sexual unions.

One of the ironies in the current work is the similarity in condom usage (last time) between married males and females in Jamaica. This requires further study in order to provide pertinent information that can be used by policy makers in framing intervention on condom use for the population and, in particular, when targeting different demographic sections of the community.

The current research highlights the inverse statistical association between stable unions and condom use in Jamaica. Clearly, as people become older, they desire stability in a sexual union, as well as children and family, which explains the lower condom use among married people in Jamaica.

Our findings reveal inconsistent condom use and infidelity among Jamaicans. Despite knowledge about how HIV/AIDS is contracted, more people contract the virus from sexual intercourse than via any other route. However, consistent condom use remains problematic in the developing world, including Jamaica. HIV is among the 10 leading causes of mortality in Jamaica,[54] and although Africa has the highest HIV infection rate in the world,[55] with the Caribbean having the highest incidence rate of HIV/AIDS in the Americas,[56,57] people in many developed nations, including Jamaica, continue to practice infidelity, infrequent condom use, and low condom usage in some marital unions.

While infidelity can be traced back to our ancestors in Africa, and offers some cultural explanation of the phenomenon in contemporary Jamaica, its practice is still widespread and propelled by economic hardship, income inequality between the sexes, the economic misfortunes of females, low education, and the high dependency on males for economic support. A study conducted in Antigua, Barbuda, Haiti, Guyana, Trinidad, Tobago, and the Dominican Republic found that one in every six women between the ages of 15 and 24 years became sexually active before the age of 15 years,[58] suggesting not only a high level of premarital sexual intercourse among young adults, but also offering an understanding of infidelity in the region.

A study by Chevannes,[59] using five Caribbean states, opined that learning to be a man, in particular in Caribbean societies, can be explained by social learning theory. Young Caribbean males imitate the social role that they see being exhibited by older men. Young males are socialized to be strong, masculine, and brave. Infidelity is embedded in Caribbean social realities. A study by Crawford et al noted that 38% of female adolescents (aged 15–17 years) were having sexual intercourse, compared with 64% of males of the same age.[46] It can be extrapolated from this work that premarital sexual activity among young adolescent males is significantly greater than that of their female counterparts, and that infidelity among adolescent males is embedded in their culture. One researcher has postulated that "early sexual activity and early childbearing are solid features of the adolescent landscape in the region".[60] Another scholar argued that Caribbean societies do not "frown" upon premarital sexual activities,[61] referring to the finding of Crawford et al that 28% of male adolescents inconsistently used a method of contraception, compared with 25% of adolescent females, and that 39% of the former consistently used a contraceptive method compared with 8% of the latter.[46]

In the aforementioned discussion, we have omitted condom fit and knowledge of proper contraceptive use in explaining the low level of contraception use, large numbers of unplanned pregnancies, and increased STI rates. A study by Nnedu et al[34] found that greater knowledge regarding STIs was associated with an increased likelihood of condom use during the last sexual episode and, again, "Does it fit okay?"[24] is omitted. Crosby et al found that men who reported ill-fitting condoms were more likely to report breakage, slippage, and difficulty reaching an orgasm for themselves and their female partners. "Does it fit okay?" was also omitted from the current work. Clearly this omission provides some explanation for inconsistent condom use among the sexes, and especially young adults who seek a good experience in their sexual encounters.

Conclusion

While most of the factors predicting condom use during the last sexual episode and consistent condom use were the same between the genders and across the population, there are dissimilarities which must be taken into consideration when formulating interventions to address fertility, family planning, STIs, HIV, AIDS, unwanted pregnancies, and teenage dropouts due to pregnancy. Denying access to contraceptive methods will only further exacerbate the current crisis of sexual behavior and STIs identified in developing nations.

In summary, the use of condoms and consistency of their use are not based on the level of education of Jamaicans, the probability of contracting HIV, occupational type, religious practices, age of respondents or age at first sexual intercourse, suggesting that cultural factors permeate these domains. Based on the literature, lack of interventions addressing these cultural variables may explain the lack of response of young people to public health intervention programs. Currently, public health intervention programs need to use a multifaceted domain approach to sexual and reproductive health in Jamaica and, by extension, the wider Caribbean countries and other developing nations. A critical issue which must be addressed by the intervention programs is spousal authorization of males and husbands in family planning, because studies show that the removal of this veto power over the use of contraception increases family planning efficiency.

Recommendation

There has never been a study in Jamaica or indeed in the Caribbean which has examined the association between men's self-reports of ill-fitting condoms and problems with consistent condom use. Thus, the lack of information makes it difficult for intervention programs to address condom use effectively, if we do not first understand this critical issue, which explains the inconsistency in condom use. We recommend that research be done to investigate the association between men's self-reports of ill-fitting condoms and condom use in general, as this will provide knowledge about how programmes can be tailored to address this issue.

Based on the research findings, there should be an ongoing national dialog with critical stakeholders including youth, service clubs, nongovernment organizations, health practitioners, the Ministry of Health, schools, colleges, universities, and religious institutions among others, about the use of condoms and other contraceptives. Some of the popular dancehall disc jockeys could be coopted to disseminate information, backed by a campaign that uses not only print media including billboards, but also the social networking sites, eg, Facebook and Twitter. The information could also be incorporated into high school, college, and university curricula. The distribution of condoms should be undertaken in educational institutions and prisons, and be widely available in health centers. The government could withhold funding from school refusing to distribute condoms to students, and a sex education quiz competition similar to the schools challenge quiz for high schools could be developed.

Acknowledgment

Disclosure

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