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Factors associated with consistent condom use among internally displaced women in Leogane, Haiti: Results from a cross-sectional tablet-based survey

Carmen Logie,^{1,2} CarolAnn Daniel³, Ying Wang¹

1 Factor-Inwentash Faculty of Social Work, University of Toronto, Toronto, Canada

2 Women's College Research Institute, Women's College Hospital, University of Toronto, Toronto, Canada

3 Faculty of Social Work, Adelphi University, Garden City, New York, United States

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Key messages:

- There is a need to better understand factors associated with consistent condom use among internally displaced women in post-disaster contexts, such as Haiti
- Intrapersonal (e.g. depression), interpersonal (e.g. lower relationship power), and structural (e.g. food insecurity) level factors reduced likelihood of condom use
- Interventions to increase condom use among internally displaced women should be tailored for women's relationship contexts and women involved in sex work

ABSTRACT

Objectives: Scant research has examined factors associated with condom use among internally displaced women in post-disaster settings, such as in post-earthquake Haiti. The study objective was to examine social ecological factors associated with consistent condom use among internally displaced women in post-earthquake Haiti.

Methods: A cross-sectional survey was conducted in 2012 with a peer-driven recruitment sample of internally displaced women in Leogane, Haiti. Peer health workers administered tablet-based structured interviews to a convenience sample of 175 internally displaced women.

Results: The 128 participants who reported being sexually active in the past four weeks were included in analyses. Two-thirds (65.2%) reported consistent condom use in the past month. In multivariate logistic regression analyses controlled for age and income, participants that reported sex work, depression, higher number of sex partners, and shorter relationship duration had lower odds of consistent condom use in the past month. Participants that reported no experiences of intimate partner violence, lower self-rated health, higher sexual relationship power, and more meals per day, had a higher likelihood of reporting consistent condom use.

Conclusions: This research provides the first assessment of contextual factors associated with consistent condom use among women displaced from a natural disaster such as Haiti's 2010 earthquake. Findings demonstrate the importance of social ecological approaches to understand intrapersonal (e.g. sex work, depression), interpersonal (e.g. relationship power,

intimate partner violence, relationship duration) and structural (e.g. food insecurity) factors associated with internally displaced women's condom use. Results can inform future sexual health research and interventions in international disaster contexts.

INTRODUCTION

Annually an average of 26.4 million people have been displaced from their homes due to natural disasters since 2008[1]. Protracted displacement, where persons are displaced for over 1 year with limited progress or durable solutions, impacts over 700,000 persons in 34 global settings. The confluence of poverty, increased gender-based violence, and limited access to sexual health services elevate HIV infection risks among women displaced from disasters and conflict[2,3]. There is an urgent need for data on sexual health and HIV vulnerabilities among internally displaced women to inform policy and practice in international crises from natural disasters[1]

Haiti's 2010 earthquake resulted in over 200,000 deaths and the displacement and homelessness of 2 million people[3]. In 2015 almost 65,000 people continued to experience protracted displacement in Haiti where they face chronic vulnerability to poverty, overcrowding, and unsafe living conditions[1]. Haiti has the highest number of people living with HIV, new HIV infections, and AIDS deaths in the Caribbean, and the second highest HIV prevalence (2.1%) in the region after the Bahamas[4]. Of Haiti's 130,000 people living with HIV, an estimated 78,000 (60%) are women[4]. Young women aged 15-24 have higher HIV infection rates (0.9%) than young men (0.6%)[4]. This overrepresentation of women in Haiti's HIV epidemic underscore the salience of understanding HIV prevention uptake among internally displaced women in post-earthquake Haiti.

Young women in Haiti had elevated HIV vulnerability even before the 2010 earthquake, with lower knowledge of AIDS than young men (33.9% vs. 40.1%)[4] and STI rates almost

twice as high[5] as young men. A 2013 UNAIDS study reported that among women in Haiti who had more than one sex partner in the past 12 months, less than half (43.2%) used a condom during their last sexual encounter[4]. These results are similar to the other Caribbean country involved in the same study, the Dominican Republic, that reported women's condom use rates of 34.9% in the past 12 months[4]. Few studies have explored factors associated with internally displaced women's uptake of HIV prevention, such as condom use, in post-earthquake Haiti. Severe et al.'s (2014) qualitative study with young women (aged 18-24) in post-earthquake Port-au-Prince reported barriers to condom use among young women included inequitable power dynamics (e.g. male partners not wanting to use condoms) as well as misconceptions about condoms[6].

Our study objective was to understand socio-demographic, structural, interpersonal, and intrapersonal factors associated with consistent condom use among internally displaced women in Leogane, Haiti.

METHODS

Study Design

This study was implemented from January to May 2012 in Leogane, Haiti, the epicenter of the 2010 earthquake. Leogane has a population of approximately 122,000; 80% of the buildings were destroyed in the 2010 earthquake and 20,000 to 30,000 of its approximately 120,000 population died during the earthquake[7]. There was limited access to adequate

health care services in Leogane before and following the earthquake[8]. Participants were recruited using modified peer driven recruitment strategy, an approach used to engage people who experience marginalization and may be hard to reach[9,10]. The research was designed and conducted in collaboration with NEGES Foundation, a community-based agency in Leogane, who purposively sampled, trained and hired internally displaced women (n=8) as peer health workers (PHW). To reduce bias we hired PHW who reflected diversity in age, residence and socio-economic status, and also limited the number of participants PHW could recruit each from their social networks to 25[9]. PHW recruited participants from social networks, and used word-of-mouth and snowball sampling techniques to recruit a maximum of 25 participants each. No print materials were used to recruit participants due to low levels of literacy, and all recruitment and study activities were conducted in Kreyol, the local dialect.

We aimed to recruit 200 people; a sample size of 148 was calculated as sufficient for logistic regression analyses using G*Power software (OR 2.0, $p < 0.05$, power 0.95). To improve clarity and appropriateness of study measures for the local context we pilot-tested the survey with the 8 PHWs and the survey was translated into Kreyol, and back-translated into English. An honorarium of \$5 U.S. was provided to study participants. Research Ethics Board approval (2011-0033-E) was obtained from Women's College Hospital, University of Toronto, Toronto, Canada. This was a community-based collaboration with NEGES Foundation in Leogane, who provided guidance and feedback into the study design, research ethics protocol, and study implementation.

Participants and eligibility

Inclusion criteria for study participants included persons who self-identified as women, aged 18 years and older, internally displaced (living in a tent, camp, and/or different residence due to dislocation from the 2010 earthquake), residing in Leogane or surrounding areas, and were able to provide informed consent.

Survey measures

We assessed consistent condom use with two questions: (1) number of times the participant had sex in the past 4 weeks and (2) number of times the participant used condoms when having sex in the past 4 weeks. If the participant reported the same number for both questions they were coded as practicing consistent condom use (Yes=1). If the participants reported using condoms less than the number of times they reporting having sex, they were coded as practicing inconsistent condom use (No=0).

We examined socio-demographic variables including age, monthly income (reported in US dollars), education (partial primary, primary and secondary and higher), employment, and sex work involvement in past 3 months (having sex in exchange for money, food, school fees, clothes, family items or transportation). To assess food security we asked for the number of daily meals typically consumed by participants.

We also examined relationship factors, including relationship status and relationship duration. To screen for intimate partner violence (IPV) we asked: *“Have you ever*

experienced physical violence from your partner?”, which was measured on a dichotomous scale (Yes=1, No=0) Sexual relationship power was measured using the ‘relationship control’ sub-scale from the Sexual Relationship Power Scale[18] (Cronbach’s $\alpha=0.88$, sub-scale range 0-58).

We used the two-item Patient Health Questionnaire-2 (PHQ-2) to screen for depression symptoms over the past 2 weeks [19] (Cronbach’s $\alpha=0.63$, scale range 0-8). Higher score of PHQ-2 means higher level of depression. To assess self-rated health (SRH) we used a single-item (*“How would you rate your overall health?”*). We assessed number of participants’ sexual partners in the past year, and if participants had concurrent sexual partnerships in the past three months.

Statistical analyses

We conducted descriptive analyses of socio-demographic variables (e.g. age, income) to determine frequencies, means and standard deviations for each variable. We summed scale items. Categorical variables were re-coded as dichotomous dummy variables. We conducted multivariate logistic regression to determine the appropriate estimates of the adjusted risk ratio for consistent condom use, controlling for significant socio-demographic variables. We first conducted univariate modeling; socio-demographic variables significant at the $p<0.05$ level were included in multivariate analysis. Non-missing participant responses were included in analyses. Statistical analyses were performed using STATA (version 12.0).

RESULTS

Study population

There were 175 women who participated in this study; in the analyses we include the 128 participants who reported having had sex in the past four weeks. Table 1 describes the characteristics of the study participants (n=128). The mean age was 36.6 (S.D.= 13.66). Nearly ten percent (9.38%) of the participants reported exchanging sex for money, food and etc. Three quarters of participants reported receiving no monthly income. Three quarters (74.22%) of participants consumed one meal or less per day. Almost half of the sample (47.66%) rated their overall health as poor. We conducted bivariate analyses (t-test, Chi square and ANOVA) to assess differences in socio-demographic and outcome variables between participants who were included and excluded in analyses; we found no significant differences.

Table 1 Main characteristics of participants (n=175)

Variables	Mean (SD)	No. of participants included (%) [*] (n=128)	No. of participants excluded (%) (n=47)	P
Age	36.55 (13.66) median=33 (range 18-74)	128	36.50 (13.55) median=33 (18-74)	0.933
Monthly income	2.52 (6.23) median=0 (range 0	128	3.68(8.65) median=	0.331

		-43.09)	(range 0-34.47)	
Sex work involvement	Yes	12 (9.38)	6 (12.77)	0.513
Education	Partial primary	40 (31.25)	18 (38.30)	0.541
	Primary	39 (30.47)	15 (31.91)	
	Secondary and higher	49 (38.28)	14 (29.79)	
Employment	Not employed	115 (89.84)	44 (93.62)	0.610
	Full time job with salary	11 (8.59)	2 (4.26)	
	Unpaid work	2 (1.56)	1 (2.13)	
Meals per day	0	16 (12.50)	6 (12.77)	0.534
	1	79 (61.72)	33 (79.21)	
	2	29 (22.66)	18 (38.30)	
	3+	4 (3.12)	0 (0)	
Relationship status	Married	6 (4.69)	8 (17.02)	0.051
	Living together	103 (80.47)	32 (68.09)	
	Dating-not living together	16 (12.50)	5 (10.64)	
	Casual dating	3 (2.34)	2 (4.26)	
Relationship duration	Less than 2 year	36 (28.12)	22 (46.80)	0.362
	2-5 years	24 (18.75)	12 (25.53)	
	5-10 years	25 (19.53)	14 (29.79)	
	10 or more years	43 (33.59)	12 (25.53)	
Self-rated overall health	Good	53 (41.41)	20 (42.55)	0.699
	Fair	14 (10.94)	6 (12.77)	
	Poor	61 (47.66)	21 (44.68)	
Number of sexual partner	3.99 (1.98) median=4 (range 1-7)	124 (missing=4)	-	0.291
Ever experienced	Yes	41 (23.84)	8 (18.18)	0.307

physical violence			
from partner			
			3
Consistent condom use	Yes	84 (65.62)	-

*Percentages calculated from non-missing responses for each variable.

Associations with consistent condom use

Logistic regression results are displayed in Table 2. This model explained 48.7% of the variation in consistent condom use scores (Pseudo $R^2=0.487$). Univariate logistic regression results indicate that participants who were older and received any monthly income were more likely to report consistent condom use than those that were younger and received no monthly income. These were the only socio-demographic characteristics significantly associated with consistent condom use.

Multivariate logistic regression analyses controlling for age and income revealed that *structural* (meals per day), *interpersonal* (relationship duration, experienced intimate partner violence [IPV], sexual relationship power), and *intrapersonal* (sex work, depression, self-rated health, number of sexual partners in last year) factors were significantly associated with consistent condom use.

As illustrated in Figure 1, with a one unit increase in number of meals per day (structural factor) the likelihood of using condoms increased by 102%.

Sexual relationship power, relationship duration, and IPV were interpersonal factors associated with consistent condom use. Figure 2 demonstrates the likelihood of consistent condom use for different sexual relationship power scores: with a one unit increase in sexual

relationship power score, the likelihood of consistently using condoms increased by 12%.

Participants in a relationship for 2-5 years were over 5 times less likely to consistently use condoms than those in relationships for less a year. Participants who never experienced IPV were 2.8 times more likely to report consistent condom use than those who had experienced IPV.

Intrapersonal factors were also significantly associated with consistent condom use. With a one unit increase in depression symptom scores, the likelihood of consistently using condoms decreased by 38%. Participants who rated their overall health as fair were 19 times more likely, and those who rated their health as poor were over 3 times more likely, to consistently use condoms than those who rated their health as good. With a one unit increase in the number of sexual partners, the likelihood of consistently using condoms decreased by 44%. Participants who engaged in sex work were over 11 times less likely to consistently use condoms. Engaging in concurrent sexual partnerships was not significantly associated with consistent condom use.

Table 2 Univariate and multivariate logistic modeling of factors associated with consistent condom use (n=128)

Variables	Unadjusted logistic regression analyses, OR (95% CI)	p Value	Adjusted logistic regression analyses,* OR (95% CI)	p Value
Socio-demographic variables				
Age	1.04 (1.02, 1.08)	0.003		
Received monthly income	3.90 (1.38, 10.99)	0.010		

Education					
Partial primary (ref)	1				
Primary	0.77 (0.30, 1.96)	0.577			
Secondary and higher	0.74 (0.30, 1.80)	0.504			
Intrapersonal factors					
Sex work involvement in past three months	0.08 (0.01, 0.40)	0.002	0.09 (0.01, 0.47)	0.004	
Self-rated health	1.53 (1.03, 2.27)	0.035	1.86 (1.06, 3.27)	0.031	
Depression	0.68 (0.55, 0.85)	0.001	0.62 (0.47, 0.81)	0.000	
Number of sex partners in past year	0.61 (0.49, 0.77)	0.000	0.56 (0.43, 0.73)	0.000	
Concurrent sex partners in past three months	2.99 (0.89, 10.04)	0.077	2.65 (0.74, 9.52)	0.135	
Interpersonal Factors					
No experiences of physical violence from partner	3.80 (1.66, 8.69)	0.002	2.82 (1.16, 6.84)	0.022	
Sexual relationship power	1.14 (1.05, 1.24)	0.001	1.12 (1.03, 1.22)	0.006	
Relationship duration					
Less than 2 year (ref)	1				
2-5 years	0.19 (0.06, 0.59)	0.004	0.18 (0.05, 0.58)	0.004	
5-10 years	0.68 (0.23, 2.04)	0.496	0.45 (0.14, 1.49)	0.192	
10 or more years	1.45 (0.52, 4.09)	0.479	0.67 (0.21, 2.18)	0.507	
Structural factors					
Meals per day	1.52 (0.88, 2.64)	0.133	2.02 (1.11, 3.71)	0.022	

Note: 85.48% correct classification of cases; Pseudo $R^2=0.487$; Adjusted for age and received monthly income

DISCUSSION

Our study is among the first to explore intrapersonal, interpersonal and structural factors associated with consistent condom use among internally displaced women in any global natural disaster context. The model is statistically significant and explained nearly half of the

variation (Pseudo $R^2=0.487$) in consistent condom use. Our study identifies a set of social ecological[11] factors associated with consistent condom use among internally displaced women in post-earthquake Leogane, Haiti.

Our finding that two-thirds of women consistently used condoms is similar to Severe et al.'s (2014) study in which 60% of young Haitian women used condoms. This is higher than the UNAIDS 2013 report that found 43.2% of women in Haiti aged 15-49 with multiple sexual partners in the past 12 months used a condom at last sex[6]. This could be due to our non-random sample, and/or the different sample characteristics (i.e. we included women who did and did not have multiple partners) and measures (i.e. condom use every time in past 4 weeks vs. at last sexual encounter). Our finding that participants in a relationship for longer were less likely to consistently use condoms corroborates prior research[12, 13]. Complex interpersonal relationships dynamics may change over time and reduce risk perceptions and increase feelings of emotional closeness and relationship importance—contributing to reduced condom use[12, 13].

Similar to prior research we found that consistent condom use among women was lower among those who had experienced IPV in their relationship[14, 15], and higher among women who reported greater relationship power[6, 15, 16]. Gender power inequities and IPV are structural pathways to women's HIV risk: they reduce women's ability to request male partners to use condoms[17]. Our finding that almost 24% of participants ever experienced IPV is higher than prior reports in which 16% of women reported having experienced IPV from a male intimate partner in the past 12 months[4]. This could be due to our question

asking if they *ever* experienced IPV by their current partner rather than limiting it to the past year.

We found food security was associated with increased condom use, this corroborates prior research in Sub-Saharan Africa that demonstrates associations between food insecurity and inconsistent condom use[14,18]. Women living in poverty may be dependent on others for food while simultaneously needing to support children and other family members, and this economic dependency may limit their ability to negotiate safer sex practices[6, 17, 18]. Understanding linkages between food security and condom use is particularly important in Haiti where over half (53.4%)—5.8 million people—of the population is undernourished[19].

Intrapersonal factors were also associated with consistent condom use. Participants who reported depressive symptoms were less likely to use condoms, corroborating prior studies that report associations between depression and reduced condom use among women[20-22]. Depression may be associated with maladaptive coping strategies, that could include sex as a coping mechanism for negative feelings; alternatively, persons experiencing depression may demonstrate avoidant coping that may compromise condom negotiation[20, 22]. Participants who rated their health as fair/poor were more likely to report consistent condom use than those rating their health as good; this could be attributed to those with good health viewing themselves at lower risk for HIV.

There were several study limitations. Our non-random sample limits generalizability of findings. The cross-sectional design precludes in-depth understanding of causality and factors associated with consistent condom use changes over time. We only had one measure of IPV

that explored physical violence; a more nuanced assessment could have provided insight into types of IPV. Social desirability bias may have led to participants over-reporting consistent condom use.

Despite these limitations, to our knowledge this is one of the first studies to apply a social ecological approach to understanding contexts of consistent condom use among internally displaced women. Future studies should engage more representative samples of internally displaced women and apply longitudinal methods to understand the trajectory of HIV vulnerabilities in post-disaster settings. Research could use larger samples to allow exploration of HIV vulnerabilities among sub-groups of internally displaced women, such as women engaged in sex work. Additionally, future studies and interventions could examine when women desire condom use as well as other forms of protective partnerships, rather than positing condom use as universally desirable.

The Internal Displacement Monitoring Centre (IDMC)'s recommendations for interventions with internally displaced persons reported the need to address: social and psychological consequences of displacement[2], such as depression; income generation; and healthcare access. The IDMC highlights the need to tailor approaches for context, class, gender and age; our findings also point to the need for interventions tailored for relationship contexts and sex work involvement. UNHCR and the Human Rights Centre at Berkeley Law's report highlighted the need for shelters in Haiti for survivors of GBV that provided housing and addressed emotional wellbeing (e.g., informal group counseling)[23]. The Inter-Agency Standing Committee (IASC) Task Force on HIV recommends HIV prevention

in humanitarian settings include participatory life-skills HIV education that addresses risk reduction, sex work and GBV, and integration of HIV education and prevention into shelter activities, including food distribution and community centres[24]. Taken together, recommended sexual health promotion strategies in disaster and humanitarian settings address social ecological factors identified as important to condom use uptake in our study, including GBV and food security.

Condoms are a key component of a comprehensive HIV prevention strategy, and increased condom use has effectively reduced HIV incidence in other contexts, such as Southern Africa[25]. Strategies aiming to reduce HIV and STI vulnerabilities among internally displaced women in Haiti require approaches that address individual, relational and structural vulnerabilities[6, 25].

Contributors CL and CD conceptualized the study design and conducted data collection. CL led the writing and development of this manuscript. YW conducted data analysis.

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Competing Interests None

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