

# Determinants of condom use among HIV-positive men who have sex with men

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**Summary:** The main objectives of this study were to identify the determinants of condom use among HIV-positive men having anal sex with HIV-negative men or men of unknown HIV status and moderators of the intention-behaviour relationship. A cohort of 237 sexually active HIV-positive men having sex with men was followed over a period of six months. The cognitive variables measured were guided by an extended version of the theory of planned behaviour. Results indicated that past behaviour (odds ratio [OR] = 9.75; 95% confidence interval [CI]: 4.48–21.26), intention (OR = 3.13; 95% CI: 1.25–7.81), self-efficacy (OR = 3.62; 95% CI: 1.40–9.37) and use of sex drugs (OR = 0.16; 95% CI: 0.06–0.45) contributed to the prediction of 100% condom use. Self-efficacy also interacted with intention as a significant moderator of the intention-behaviour relationship (OR = 20.96; 95% CI: 2.90–151.51). Interventions promoting condom use should increase self-efficacy to use condoms and target users of sex drugs.

**Keywords:** condom use, men having sex with men (MSM), HIV, theory of planned behaviour, moderator, prevention, self-efficacy, recreational drugs

## INTRODUCTION

The HIV pandemic remains one of the most serious infectious disease challenges to public health.<sup>1</sup> In North America, HIV epidemics are primarily concentrated among populations most at risk, such as men who have sex with men (MSM), injecting drug users (IDUs), sex workers and their sexual partners.<sup>1</sup>

Unprotected anal sex between men is a major cause of HIV transmission in Canada and the USA.<sup>2</sup> A survey of MSM in Montréal, Canada, indicated that this behaviour was more frequent among HIV-positive (HIV+) MSM.<sup>3</sup> Evidence regarding sexual risk behaviour among HIV+ MSM suggests that the prevalence of unprotected anal sex has increased in recent years and a proportion of this risky behaviour among MSM seems to occur with a partner whose HIV status is HIV-negative (HIV-) or unknown.<sup>4</sup>

In the scientific literature there is an increased interest in finding moderators of the intention-behaviour relationship because a number of people who have the intention to adopt a given behaviour fail to do so (i.e. intention-behaviour gap). A moderator is a variable that affects the relationship between a determinant and the behaviour it aims to predict.<sup>5</sup> Moderator analysis could help orient interventions aimed at increasing condom use among MSM living with HIV.

A meta-analysis of six potential moderators of condom use revealed that age and type of partner moderated the intention-behaviour relationship.<sup>6</sup> The intention-behaviour relationship was weaker among younger samples indicating that adolescents had more difficulty to act on their intention compared with undergraduate and adult samples. Moreover, the correspondence between intention and behaviour was better with steady partners compared with casual partners. There is also evidence that anticipated regret,<sup>7</sup> moral norm<sup>8</sup> and past behaviour<sup>9,10</sup> can influence how well intentions predict different health-related behaviours.

The present study uses an extended version of the theory of planned behaviour (TPB)<sup>11</sup> to study 100% condom use among HIV+ MSM. More precisely, the four objectives of the study were to investigate (1) the determinants of 100% condom use among HIV+ MSM having anal sex with HIV- men or men of unknown HIV status; (2) the determinants of intention to engage in this behaviour; (3) moderators of the intention-behaviour relationship and (4) factors on which programmes promoting condom use among HIV+ MSM should be based. Three categories of variables were considered: sociodemographic variables, context and life experience variables and cognitive variables.

## THEORETICAL FRAMEWORK

There is evidence that Ajzen's TPB is a good theory for predicting health-related behaviours including condom use.<sup>12,13</sup> According to the TPB, behaviour is directly predicted by intention and

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perceived behavioural control (PBC) for less volitional behaviour. PBC is an individual's perception of his ability to adopt a given behaviour. PBC can also be a determinant of intention along with attitude and subjective norm. Attitude represents how favourable or unfavourable an individual is to the adoption of a given behaviour. Subjective norm is an individual's perception of the expectations of significant others about performing a given behaviour. Attitude, subjective norm and PBC are related, respectively, to the following set of beliefs: behavioural beliefs, normative beliefs and control beliefs.

The following cognitive variables were added to the TPB in an effort to increase its predictive value given that they have already been successfully included into Ajzen's model to predict condom use:<sup>12,14,15</sup> anticipated regret, descriptive norm, moral norm, role beliefs, self-efficacy and past behaviour. Anticipated regret refers to feelings of regret at the thought of not adopting a given behaviour.<sup>7</sup> Descriptive norm is an individual's perception of the number of people of his entourage who adopt a given behaviour.<sup>16</sup> Moral norm refers to an individual's feeling of obligation to adopt a given behaviour.<sup>8</sup> Role beliefs reflect the cultural context of the group of people with whom an individual interacts.<sup>17</sup> Self-efficacy is an individual's perception of his ability to overcome potential barriers to adopt a given behaviour.<sup>18</sup>

Finally, the following sociodemographic, context and life experience variables were also included given there is evidence that they are related to the sexual behaviour of MSM:<sup>19-24</sup> age, level of education, occupation (employed versus unemployed), annual income, whether the person is living with a partner or not, use of sex drugs, alcohol and intravenous drugs, quality of life, social support as well as time since the individual became HIV+.

## METHODS

### Sample

For the present study, a subsample of sexually active MSM was taken from a larger study on individuals living with HIV (MAYA study). All participants were recruited in an open cohort that began in October 2004 and ended in December 2007. Recruitment was done by health-care workers in 11 medical clinics or via a mass-media campaign by means of flyers and posters in health clinics and public places in Montréal, Canada. At baseline, a total of 904 participants were recruited, of whom 520 were MSM. Six months later, 24 MSM dropped out of the study and 259 reported not being sexually active. Given that the main objective of the study was to identify the determinants of condom use among sexually active HIV+ MSM, the sample of the present study is comprised only of the 237 HIV+ MSM who reported having had sex (anal or oral) in the past six months. This study was approved by the institutional review board as well as by those of each hospital and health-care centre affiliated with the project.

### Data collection

As suggested by Godin and Kok,<sup>25</sup> the questionnaire used for the interview was developed as follows: firstly, 75 HIV+ people were questioned about their beliefs concerning the use of condoms; secondly, qualitative analysis of content allowed the adaptation of theoretical constructs to specific beliefs of

the study population; and finally, a preliminary version of the questionnaire was developed according to the recommendations of the author of the TPB.

Psychosocial, sociodemographic, context and life experience information was collected by means of semistructured interviews given the length of the questionnaire. The interviews were conducted by trained health-care workers at a medical clinic or at the local university and lasted around 90 minutes. For example, use of sex drugs was assessed by the following question: 'In the last six months, how often did you use the following substances: Viagra, poppers, snorted cocaine, crack, crystal meth, ecstasy, etc?' Quality of life was assessed using the New England Research Institutes Multidimensional Quality of Life Questionnaire for Persons with HIV/AIDS (MQOL-HIV),<sup>26</sup> while social support was assessed using the Medical Outcomes Study Social Support Survey (MOS).<sup>27</sup> For the study sample, Cronbach's alpha coefficients<sup>28</sup> for MQOL-HIV and MOS were 0.73 and 0.96, respectively. The items for the cognitive variables with their means and standard deviations and their internal consistency are presented in Table 1. All items were measured using five-point Likert-type scales, except attitude which was measured with a seven-point semantic differential scale.

Six months later, participants self-reported their behaviour by answering a questionnaire containing three items about their sexual behaviour of the last six months with a regular male partner whose HIV status was unknown or HIV-, and with a casual male partner (see Table 1). For each item, MSM had to answer about their use of a condom for the following two sexual acts: (1) when they penetrated their partner in the anus; and (2) when their partner penetrated them anally. Participants had the option to tick a box indicating they did not engage in any anal sex.

### Statistical analyses

Determinants of behaviour and intention were identified by means of multiple logistic regression among HIV+ MSM who reported being sexually active. The behaviour under study was defined as having used condoms 100% of the time with a partner whose HIV status was unknown or negative in the past six months. This statistical approach was chosen given the dichotomous nature of the behaviour under study and given that intention to use condoms was skewed to the negative side. All the cognitive variables were dichotomized at the median value since they were also negatively skewed. In order to choose which variables to enter into the prediction model, univariate analyses were carried out on all the cognitive, sociodemographic, context and life experience variables; only the variables with a  $P < 0.15$  were entered into the regression models. Of all the variables entered, only those reaching statistical significance ( $P < 0.05$ ) were kept in the prediction model.

Moreover, a series of three-step logistic regression was used to test the following variables as potential moderators of the intention-behaviour relationship: PBC, past behaviour, moral norm, anticipated regret, self-efficacy, role beliefs as well as the sociodemographic, context and life experience variables. Finally, to obtain information for designing targeted interventions, a standard logistic regression was used to identify the beliefs discriminating participants according to their level of intention.<sup>29</sup> All the statistical analyses were conducted using SAS version 9.1 (SAS Institute, Cary, NC, USA).

Table 1 Questionnaire items used to measure variables of the extended version of the theory of planned behaviour

Variables (mean ± SD)	Items	α
Behaviour	In the last six months, what percentage of the times you had anal sex with a regular male partner of unknown HIV status did you use a condom? In the last six months, what percentage of the times you had anal sex with a regular HIV-negative male partner did you use a condom? In the last six months, what percentage of the times you had anal sex with a casual male partner did you use a condom?	N/A
Intention (4.44 ± 0.87)	Over the next six months, do you intend to use a condom every time you have anal sex with a partner whose HIV status is negative or unknown? Are you motivated to use a condom every time you have anal sex with a partner whose HIV status is negative or unknown, over the next six months? Are you determined to continue using a condom every time you have anal sex with a partner whose HIV status is negative or unknown, over the next six months?	0.89
Attitude (3.97 ± 1.39)	Over the next six months, if you use a condom every time you have anal sex with a partner whose HIV status is negative or unknown, this will be... (a) Unpleasant/pleasant (b) Boring/exciting (c) Uncomfortable/comfortable (d) Disagreeable/agreeable	0.90
Behavioural beliefs (4.00 ± 0.64)	If you use a condom every time you have anal sex with a partner whose HIV status is negative or unknown, over the next six months, will this have any of the following consequences for you? (a) Prevent you from transmitting the disease to your partner (b) Protect you from STIs other than HIV (c) Allow you to avoid re-infection with HIV (d) Allow you to continue to have sex (e) Decrease pleasure (r) (f) Ruin spontaneity (r) (g) Cause erection problems (yourself and/or your partner) (r) (h) Prevent you from feeling guilty afterwards (i) Pose a barrier to intimacy and love (r) (j) Be uncomfortable for the one wearing it (it pulls, squeezes, hurts, etc.) (r) (k) Make sex less natural (r) (l) Interrupt the flow of sex (r) (m) Breach the trust between your partner and you (r)	0.81
Subjective norm (4.69 ± 0.53)	Do the people who are important to you think that you should use a condom every time you have anal sex with a partner whose HIV status is negative or unknown, over the next six months? Do the significant people in your life to you agree or disagree with the fact that you should use a condom every time you have anal sex with a partner whose HIV status is negative or unknown, over the next six months? Do the people you are close to approve of your using condoms every time you have anal sex with a partner whose HIV status is negative or unknown, over the next six months?	0.71

(Continued)

Table 1 Continued

Variables (mean ± SD)	Items	α
Normative beliefs (4.62 ± 0.42)	Over the next six months, how much will the following people or groups of people be in favour of or opposed to you always using a condom during anal sex with a partner whose HIV status is negative or unknown... (a) Your current partner (b) Your friends, the people around you (c) Your doctor (d) The members of your immediate family (father, mother, brothers, sisters or children) (e) The health care or social workers you see (f) Other people that you know who are infected with HIV (g) People from your community, social networks	0.71
Perceived behavioural control (4.40 ± 0.75)	If you want, do you really believe you can use a condom every time you have anal sex with a partner whose HIV status is negative or unknown, over the next six months? Will it be easy or hard for you to use a condom every time you have anal sex with a partner whose HIV status is negative or unknown, over the next six months? If you want, will you be able to continue using a condom every time you have anal sex with a partner whose HIV status is negative or unknown, over the next six months?	0.77
Self-efficacy (4.14 ± 0.94)	Over the next six months, do you believe you will be able to use a condom every time you have anal sex with a partner whose HIV status is negative or unknown, even if... (a) Your partner does not want to (b) You have trouble getting them for free or at low cost (c) Your partner tries to pressure you into not using it (d) You have to convince your partner to use it (e) You are sexually excited (f) You feel like you are really in love (g) You are under the influence of alcohol (h) You are under the influence of drugs (i) You are afraid of disappointing your partner (j) You are afraid of losing your partner (k) You have to take control of the encounter so that it remains safe	0.96
Descriptive norm (3.38 ± 0.90)	In your opinion, among the people you know who are living with HIV, how many use condoms every time they have anal sex with a partner whose HIV status is negative or unknown?	N/A
Anticipated regret (4.35 ± 0.94)	Over the next six months, if you do not use a condom every time you have anal sex with a partner whose HIV status is negative or unknown, you will regret it the next day Over the next six months, if you do not use a condom every time you have anal sex with a partner whose HIV status is negative or unknown, you will be very preoccupied afterward Over the next six months, if you stop using a condom every time you have anal sex with a partner whose HIV status is negative or unknown, you will feel very bad afterward	0.91

(Continued)

Table 1 Continued

Variables (mean ± SD)	Items	α
Moral norm (4.49 ± 0.77)	Will using a condom every time you have anal sex with a partner whose HIV status is negative or unknown be considered a duty to you? Using a condom every time you have anal sex with a partner whose HIV status is negative or unknown will be a question of responsibility for you Using a condom every time you have anal sex with a partner whose HIV status is negative or unknown is a moral obligation for you	0.88
Role beliefs (4.71 ± 0.57)	Using a condom every time you have anal sex with a partner whose HIV status is negative or unknown is appropriate for someone who is HIV-positive Using a condom every time you have anal sex with a partner whose HIV status is negative or unknown is the normal thing to do for someone who is HIV-positive Using a condom every time you have anal sex with a partner whose HIV status is negative or unknown is what you must do when you have HIV	0.78

(r) = reverse coded; STI = sexually transmitted infections

## RESULTS

### Participants

Participants were compared with those who dropped out of the study at the six-month follow-up. The only difference observed was with occupation; more drop-outs reported being unemployed ( $\chi^2 = 5.49$ ; degrees of freedom [d.f.] = 1;  $P < 0.05$ ). The mean age of respondents was  $42.5 \pm 8.8$  (range: 18–77 years). Roughly 70% of participants had attained an education level higher than high school, were employed and had an annual income of at least CAD \$15,000. Moreover, 67% of participants reported using sex drugs, 43% alcohol and 3% intravenous drugs. Finally, 71% of the sample was comprised of MSM who were HIV+ for more than three years.

### Determinants of 100% condom use

At follow-up, 69% of HIV+ MSM reported having used a condom 100% of the time with a partner whose HIV status was unknown or HIV- in the past six months. Univariate analyses indicated that the following sociodemographic, context and life experience variables were all non-significantly related (all  $P$ s  $> 0.15$ ) to condom use at the six-month follow-up: age, occupation, whether the person was living with a partner or not, alcohol use, intravenous drug use, quality of life, social support and time since the individual became HIV+. On the other hand, all the cognitive variables as well as the use of sex drugs were significantly related to condom use (all  $P$ s  $\leq 0.0001$ ).

The model of behaviour, before any interaction terms were tested, showed that past behaviour ( $P < 0.0001$ ), intention ( $P = 0.0148$ ), self-efficacy ( $P = 0.0082$ ) and use of sex drugs ( $P = 0.0006$ ) contributed significantly to predict 100% condom use among sexually active HIV+ MSM (see Model 2 in Table 2). A lower proportion of sex drug users reported using condoms 100% of the time compared with their counterparts

Table 2 Logistic regression models for 100% condom use among HIV-positive men who have sex with men ( $n = 237$ )

	Models odds ratio (95% confidence interval)	
	1	2
Past behaviour	8.77 (3.70–20.83)	9.75 (4.48–21.26)
Intention	3.93 (1.15–13.45)	3.13 (1.25–7.81)
PBC	1.81 (0.57–5.76)	
Self-efficacy	3.27 (1.09–9.82)	3.62 (1.40–9.37)
Anticipated regret	1.21 (0.42–3.48)	
Moral norm	0.94 (0.30–2.96)	
Role beliefs	0.47 (0.14–1.62)	
Descriptive norm	1.53 (0.63–3.57)	
Use of sex drugs	0.19 (0.06–0.60)	0.16 (0.06–0.45)
Level of education	1.06 (0.66–1.70)	
Annual income	0.94 (0.74–1.19)	
Likelihood ratio (-2 log)	153.80	165.39*
Index of concordance (%)	91.6	90.9

PBC = perceived behavioural control  
\*Model 1 versus model 2:  $\chi^2 = 11.59$ ; d.f. = 7;  $P = 0.1150$

not using sex drugs (59% versus 91%;  $\chi^2 = 23.73$ ; d.f. = 1;  $P < 0.0001$ ). The Hosmer and Lemeshow<sup>30</sup> goodness-of-fit test was non-significant ( $P = 0.1535$ ), which indicates that the model seems to fit the data quite well. Moreover, the model correctly classified 90.9% of participants, which is considered excellent.

### Determinants of intention to use condoms 100% of the time

Given that intention contributed to the prediction of behaviour, its determinants were investigated. The intention to use a condom a 100% of the time with a male partner whose HIV status is unknown or negative was very high with a mean score of 4.4 on a scale ranging from one to five. Univariate analyses indicated that the following sociodemographic, context and life experience variables were all unrelated (all  $P$ 's  $> 0.15$ ) to intention to use condoms all the time: age, level of education, occupation, annual income, whether the person was living with a partner or not, alcohol use, intravenous drug use and quality of life. On the other hand, all the cognitive variables were significantly related to intention (all  $P$ s  $< 0.001$ ). Among the socio-demographic, context and life experience variables, only use of sex drugs ( $P = 0.0079$ ) was significantly related to intention, whereas social support ( $P = 0.0907$ ) and time since the individual became HIV+ ( $P = 0.0739$ ) were near significance.

The final model showed that attitude ( $P = 0.0038$ ), PBC ( $P < 0.0001$ ), self-efficacy ( $P = 0.0078$ ), moral norm ( $P = 0.0048$ ) and role beliefs ( $P = 0.0009$ ) were significant determinants of intention to use condoms 100% of the time among sexually active HIV+ MSM (see Model 2 in Table 3). The Hosmer and Lemeshow<sup>30</sup> goodness-of-fit test was not significant ( $P = 0.1036$ ), which indicates that the model seems to fit the data quite well. Moreover, the model correctly classified 94.0% of participants, which is considered excellent.

### Moderator of the intention-behaviour relationship

Of all variables tested, the logistic regression analyses indicated that the intention-behaviour was moderated by self-efficacy

**Table 3 Logistic regression models for intention to use condoms 100% of the time among HIV-positive men who have sex with men (n = 237)**

	Models odds ratio (95% confidence interval)	
	1	2
Past behaviour	1.99 (0.70–5.71)	
Attitude	3.74 (1.43–9.76)	3.80 (1.54–9.38)
Subjective norm	1.42 (0.54–3.74)	
PBC	9.98 (3.67–27.19)	11.26 (4.42–28.69)
Self-efficacy	3.45 (1.25–9.53)	3.48 (1.39–8.70)
Anticipated regret	0.86 (0.30–2.45)	
Moral norm	3.60 (1.31–9.93)	3.85 (1.51–9.85)
Role beliefs	8.80 (2.27–34.06)	8.05 (2.34–27.66)
Descriptive norm	0.79 (0.30–2.08)	
Use of sex drugs	0.55 (0.20–1.52)	
Social support	1.00 (0.98–1.02)	
Time since HIV+	1.01 (0.93–1.09)	
Likelihood ratio (–2 log)	127.87	133.16*
Index of concordance (%)	94.7	94.0

PBC = perceived behavioural control  
\*Model 1 versus model 2:  $\chi^2 = 5.29$ ; d.f. = 7;  $P = 0.6237$

only (odds ratio [OR] = 10.52; 95% confidence interval [CI]: 2.01–54.89). This interaction term was then tested as a potential determinant of 100% condom use among sexually active HIV+ MSM. The intention–behaviour relationship was stronger among HIV+ MSM who had a high level of self-efficacy (OR = 24.75; 95% CI: 6.10–100.35) when compared with those with a low level of self-efficacy (OR = 2.35; 95% CI: 0.98–5.67). Among HIV+ MSM with high self-efficacy, 96% were high intenders who adopted 100% condom use whereas for HIV+ MSM with low self-efficacy, the distribution of behaviour was nearly split half-and-half among low intenders.

### Structure of beliefs associated with level of intention

Logistic regression revealed that two control beliefs and two behavioural beliefs discriminated participants according to their level of intention. The two control beliefs were being able to use a condom ‘even if you are very sexually excited’ (OR = 8.81; 95% CI: 3.56–21.83) and ‘even if you are afraid of disappointing your partner’ (OR = 4.33; 95% CI: 1.81–10.34). The behavioural beliefs were believing that using a condom will ‘prevent you from feeling guilty afterwards’ (OR = 3.85; 95% CI: 1.75–8.44) and ‘decrease pleasure’ (OR = 2.96; 95% CI: 1.38–6.45).

## DISCUSSION

Previous studies have reported that the TPB was a successful theory to predict health-related behaviours, including condom use.<sup>12,13</sup> The present study adds to this literature with an application among a group of HIV+ MSM.

Our results are in agreement with those of a meta-analysis of studies on condom use which indicated that self-efficacy was a strong predictor of intention to use condoms and of condom use, especially among HIV+ MSM.<sup>31</sup> Moreover, in line with the TPB, intention to use condoms was another important determinant of this behaviour, indicating that HIV+ MSM usually act on their stated intention. Another study also obtained intention as a significant predictor of unprotected

anal intercourse among HIV+ MSM.<sup>32</sup> The intention–behaviour relationship was also moderated by self-efficacy. Participants who had a positive intention coupled with a high level of self-efficacy used condoms 100% of the time in a higher proportion than those with a low level of self-efficacy.

Attitude and PBC contributed to predict intention to use condoms 100% of the time among HIV+ MSM. In earlier studies, attitude and PBC were also found to be strong predictors of the intention to use condoms.<sup>12,14,15</sup> Interestingly, in the present study, both PBC and self-efficacy were determinants of the intention to use condoms all the time. This suggests that these two constructs likely represent different aspects of control. This was previously noted by Trafimow *et al.*<sup>33</sup> who suggested that control is formed of two dimensions: controllability and difficulty.

In line with previous studies on condom use, moral norm was another significant determinant of intention.<sup>12,14</sup> Role beliefs were also identified as a determinant of intention to use condoms 100% of the time. Thus, it seems that HIV+ MSM who intend to have safe sex with HIV– or partners with an unknown status feel they have a moral obligation to use a condom and assume that this is the normal thing to do for someone who is HIV+.

Two behavioural beliefs as well as two control beliefs were found to significantly predict intention to use condoms 100% of the time among HIV+ MSM. More MSM with low intentions thought that condom use decreases pleasure, while those with high intentions thought that this behaviour prevents the feeling of guilt afterwards. Another study also found that individuals who believe that using condoms has negative consequences such as diminished sexual pleasure were less consistent in using condoms.<sup>34</sup> The control beliefs predicting intention included sexual excitement and disappointing the partner as barriers to using condoms among MSM with low intentions to use them.

Interestingly, the following control belief contributed to predict both behaviour and intention: ‘You will be able to use a condom even if you are sexually excited’. Thus, sexual excitement is evaluated as a very important barrier for low intenders of using condoms. Indeed a longitudinal study conducted among HIV+ MSM revealed that men who felt they could not control their sexual urges and impulses engaged more in unsafe sex compared with those who had more control over their sexuality.<sup>32</sup> Furthermore, similarly to the results of many studies among MSM,<sup>35–39</sup> the use of sex drugs such as poppers, Viagra, etc. negatively influenced 100% condom use.

Programmes promoting condom use among sexually active MSM living with HIV should target users of sex drugs and focus on increasing self-efficacy to use condoms. A Cochrane review of behavioural interventions to reduce risk of sexual transmission of HIV among MSM revealed that interventions with a self-efficacy component could significantly reduce unsafe sex among MSM by 17%.<sup>40</sup> Interventions promoting condom use should also favour the development of a positive intention to use condoms by targeting its significant determinants.<sup>41</sup> For example, the belief that using condoms decreases pleasure can be undermined or acknowledged while stressing that using condoms prevents the feeling of guilt afterwards.

The present study has certain limitations which need to be mentioned. First, there is no possibility to establish if the study sample is representative of the whole HIV+ MSM population. Volunteers were recruited from multiple sources and most medical clinics contacted were involved, but it is known

that not all HIV+ MSM go to these clinics and others might not have been aware or interested by this study. Second, the study was conducted in a French-speaking milieu generally considered open to MSM. Hence, it is not possible to extend the findings to other cultural sites. Nonetheless, the present findings were in agreement with similar studies conducted in other countries. Third, as it is the case in many studies on condom use, behaviour was self-reported. It is thus possible that a social desirability bias tainted respondents' answers.

To conclude, the present study adds to the literature about the usefulness of an extended version of the TPB in studying condom use among HIV+ MSM. To our knowledge, it is also the first study to obtain results indicating that self-efficacy can moderate the intention-behaviour relationship among this population. Finally, we believe that the information provided could be very useful for implementing interventions promoting condom use among MSM living with HIV.

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