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RESEARCH ARTICLE

'YOU SHOULDN'T TRUST WHAT I TELL YOU IN A SURVEY': A MIXED METHODS STUDY ON CONTRADICTIONS REGARDING CONDOM USE BETWEEN STATEMENTS FROM HIV POSITIVE MEN WHO HAVE SEX WITH MEN IN QUANTITATIVE SURVEYS VERSUS IN-DEPTH QUALITATIVE INTERVIEWS

[1,*]Roberto Garcia, [1]Denise G. Ramos and [2]Mariliza H. da Silva

[1]Programa de Pós Graduação em Psicologia Clínica da Pontifícia Universidade Católica de São Paulo, São Paulo, SP
[2]Centro de Referência e Treinamento de DST, Aids, Programa Estadual de São Paulo – Gerencia de Assistência Integral

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ABSTRACT

Background: Previous studies demonstrate that the incidence of HIV infection has increased among men who have sex with men. And yet, quantitative surveys fail to demonstrate a corresponding change in their behavior.
Aims: To conduct a mixed methods study about condom use among HIV positive individuals, comparing reports provided through a quantitative survey and a qualitative interview.
Methods: We collected quantitative data from 178 HIV positive participants, 81 of them also undergoing a qualitative interview.
Results: A total of 73 (41%) individuals in our overall sample reported to always use condoms during sex in the quantitative survey (n = 178), while in our qualitative interview sub-sample only 14 (17.3%) individuals did not report behaviors that contradicted the constant use of condoms (n = 81), the decrease in percentage being attributed to contradictions. A large percentage of these individuals providing contradictory statements reported making use of illicit drugs during sex. We also found a number of qualitative emerging concepts indicating that contradictory statements were made in the context of fictitious scenarios where condoms were not used, situations where trust was questioned, simply not being willing to use condoms without any apparent rationale, darkrooms, and situations where patients willingly engaged in extreme sexual behaviors.
Conclusions: Given the discrepancy between what individuals report in quantitative surveys and what they subsequently report during qualitative interviews, clinical and policy guidelines should be cautious in interpreting surveys without a parallel, qualitative component.

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INTRODUCTION

Despite current treatment efficacy in controlling the progress of HIV/AIDS, this condition is still an important public health concern (Bertozzi *et al*., 2006). HIV/AIDS was first reported in the United States, predominantly among men who have sex with men (CDC & others, 1981; Friedman-Kien *et al*., 1981), a group presenting one of the highest risks for HIV transmission (Beyrer *et al*., 2012). Despite constant public health campaigns, recent reports have pointed to an increase in the incidence of HIV/AIDS among men who have sex with men. The reasons for these rising rates are still poorly understood.

Corresponding author: Roberto Garcia
Programa de Pós Graduação em Psicologia Clínica da Pontificia Universidade Católica de São Paulo, São Paulo, SP.

Given that most quantitative surveys do not point toward a substantial change in behavioral patterns (Li *et al*., 2014; Park *et al*., 2013; Silan *et al*., 2013), one possibility would be that reports provided through quantitative surveys might not be aligned with actual behavior. The potential contradiction between reports from quantitative surveys and qualitative interviews has been previously reported in other contexts. For example, the Pleasure and Sexual Health survey uses a mixed-methods approach to identify potential contradictions between stated beliefs and actual behavior among gay men. This discrepancy was attributed to two primary factors. First, fear that a disclosure in surveys could later relate the individual to risky behavior. Second, a sense of overconfidence regarding a minimal risk of HIV infection, ultimately leading to distortions in their narratives (Prestage *et al*., 2012).

In another study, a mixed-methods design was used to investigate why drug addicts share needles, identifying conflicting findings between quantitative and qualitative results. Specifically, while in the quantitative survey participants indicated that needle sharing took place when drug users did not have access to sterile needles, qualitative interviews identified the primary reason as the urge caused by withdrawal. In addition, study participants were also concerned about the survey being part of a government program to target individuals incurring in risky sexual behavior (Wagner *et al*., 2012). Despite these initial results, to our knowledge no previous studies have specifically focused on discrepancies in behavioral reporting in relation to condom use among HIV/AIDS positive men who have sex with men.

In face of this gap in the literature, the objective of this study was to contrast quantitative and qualitative results obtained from a large mixed methods study among HIV/AIDS-positive men who have sex with men. Specifically, we attempted to identify possible contradictions between what was initially stated in a traditional quantitative survey and a subsequent, in-depth qualitative interview, specifically targeting the frequency and behaviors surrounding condom use.

MATERIALS AND METHODS

We conducted a quantitative survey followed by a series of qualitative interviews. This article specifically focuses on the discrepancies in reporting condom use between the quantitative and qualitative components of our study among participants who previously reported always using a condom while engaging in sex with other men. Our study was designed and reported in accordance with the COREQ (COnsolidated criteria for REporting Qualitative research) guideline (Tong, Sainsbury, & Craig, 2007).

Ethics

This project was approved by the Institutional Review Board of the Pontificia Catholic University of Sao Paulo (PUC-SP) and the Brazil Platform. Informed consent was signed by all potential participants prior to study initiation.

Research team and its influence on qualitative design and interpretation

Interviews were conducted by the first author (RG), a male who holds an undergraduate and master's degree in Clinical Psychology. At the time of the interview, he was working as a full-time researcher on his doctoral project, also having prior training and four years of experience in conducting qualitative interviews.

Theoretical framework for qualitative analysis

We followed a mixed-methods approach combining quantitative and qualitative data. Coding for emerging concepts was performed by the first author (RG), the coding being added using the QualiQuantiSoft software (http://www.spi-net.com.br, last accessed December 2015). We used a Collective Subject Discourse Analysis as the theoretical framework for our qualitative analysis. This framework describes how participants perceive, reflect, and attribute meaning to experiences they have lived, specifically allowing participants to express their opinions in face of each question. As a result, similarly expressed meanings are aggregated into a single discourse aimed at representing a collective opinion (F. Lefevre & Lefevre, 2010; F. Lefevre & Lefevre, 2005).

Participant selection

Participants were selected through a clinic, Centro de Referência e Tratamento DST/ HIV/AIDS (CRT DST/HIV/AIDS) for sexually transmitted diseases and HIV/AIDS in the city of Sao Bernardo do Campo, Brazil. No further details about this clinic are provided in order to ensure patient confidentiality. A convenience-sampling methodology was used, both for the quantitative survey as well as the qualitative subset. Clinic staff was instructed to ask subjects to participate in the study based on inclusion criteria. Individuals demonstrating an interest were then referred to the first author (RG). Participants were eligible if they were male, aged 18 years or over, reportedly had sex with other men or had sex with both men and women, were HIV positive, were provided with ambulatory care at that location, were able to read, and agreed to both participate in the study as well as sign the informed consent. The interviewer's background was only disclosed to participants who requested further details. Of the 178 participants who agreed to participate in the study, all participated in the quantitative survey and 81 participants took part in the qualitative interviews (45.5%).

Setting

Data were collected in two stages. First for the qualitative component of this study. This was carried out at the clinic (CRT DST/HIV/AIDS), in a private room. The only people present during data collection were the first author (RG) and the study participant. Second for the quantitative component, due to clinical logistics, data collection was carried out in the waiting room where patients waited for their previously scheduled appointments.

Data collection

We performed the data collection using paper forms initiated through the quantitative survey.

Quantitative survey

The quantitative survey included a number of scales. First, the Barrett Impulsivity Scale (BIS-11) (Patton, Stanford, & others, 1995), using a previously cross-cultural translated and adapted version to Brazilian Portuguese (Malloy-Diniz *et al*., 2010; Vasconcelos, 2012). The BIS-11 is a self-reported scale measuring three impulsiveness-related sub-constructs: (a) Motor, related to the non-inhibition of incoherent responses within a given context, (b) Attentional, related to immediate decision making, and (c) Lack of planning, related to immediate behavior. BIS-11 presents participants with Likert-type items going from "rarely or never" to "almost always/always", higher scores indicating a higher level of impulsive behavior. Second, the Sexual Compulsivity Scale (SCS) (Kalichman & Rompa, 1995) was previously translated to Portuguese (Carvalho & Nobre, 2011), and subsequently cross-culturally translated, adapted, and psychometrically

validated for use in Brazil (Scanavino *et al*., 2016). The SCS measures compulsive behavior, sexual concerns and repeated intrusive thoughts. The SCS contains 10 Likert-type items, going from "nothing" to "a lot". A threshold of 24 or greater indicates a compulsive sexual behavior. Finally, the socio-demographic questionnaire included questions regarding gender, age, ethnicity, marital status, education, occupation, income, routine sexual habits and behavior, as well as participants' perceptions regarding their families and personal relationships. In addition, information associated with participants' HIV infection was collected, including time of infection, as well as the associated use of illicit drugs and other controlled substances.

Qualitative interviews

The qualitative component involved presenting fictional stories so that participants could project their personal experiences into those narratives. Participants were initially assured that if the interview were to elicit discomfort the process would be immediately interrupted and psychological support would be provided. This was followed by an in-depth, open, semi-structured qualitative interview focusing on respondents' experiences with HIV, condom use, impulsivity and risky contexts. Participants were then exposed to a poster from the National Campaign against AIDS in 2014, promoted by the Brazilian Ministry of Health and aimed at raising awareness regarding condom use and HIV prevention. No repeat interviews were performed to validate previous findings. Interviews were performed using an audio recording device, all files being destroyed after transcription. Each interview lasted approximately one hour. Data collection continued up to the point of saturation, saturation being defined as a series of interviews not resulting in any new emerging concepts as identified by the research team. No transcripts were returned to participants for review.

Data analysis

Qualitative reporting

When presenting results, quotes from the raw interview material were used to illustrate findings, emerging themes, no quotes being identified by numbers in order to decrease the risk of privacy breaches. Finally, quantitative methods were used for triangulation.

Quantitative and qualitative analyses for mixed methods

The exploratory analysis included all individuals completing the quantitative survey to describe our entire study sample and thus characterize the study population, while the identification of contradictions was focused on the subset of 81 individuals who also underwent a qualitative interview. The quantitative analysis started by evaluating distributions, frequencies and percentages for each of the numeric and categorical variables. Categorical variables were evaluated for near-zero variation (Kuhn & Johnson, 2013). Extensive graphical displays were used for both univariate analysis and bivariate associations, along with broader tests such as Maximal Information Coefficient (Reshef *et al*., 2011) and Non-negative Matrix Factorization (Paatero & Tapper, 1994) algorithms for numeric variables.

Missing data were explored using a combination of graphical displays involving univariate, bivariate and multivariate methods. The qualitative analysis was conducted using interview transcripts in Portuguese, translations being provided in the manuscript. Qualitative data encoding was primarily performed by the first author (RG), with emerging concepts being progressively aggregated into categories. These categories were discussed with the other authors, although we did not perform a formal observer agreement evaluation. The dataset for mixed-methods analysis was arranged so that the quantitative and qualitative components were merged into a single data frame, with the qualitative component including quotes from each emerging concept displayed in individual columns. These quotes underwent a statistical stemming process followed by descriptive statistics performed through frequency and percentage of each stem category. Concepts emerging from the qualitative analysis were also compared in relation to the variable stating that the participant always made use of a condom. Co-occurrence was evaluated through hierarchical heatmaps using cluster analysis on the tagged components for each emerging concept. The overall association between emerging theme and condom use was assessed through a binomial test, a non-significant p value ($p > 0.05$) indicating that there was no statistically significant difference between groups. In addition, Venn diagrams were used to identify concept collocation across different text units. Finally, word clouds were used to map word stems characterizing an analysis unit. Translations were made by bilingual researchers for selected quotes inserted in the manuscript, each translation being independently checked for accuracy. All quantitative analyses were performed with the R statistical language along with the qdap package for qualitative analysis.

RESULTS

Overall sample description

Most participants in the quantitative study were White, with slightly over 50% of them being in a stable relationship and openly disclosing their HIV status to others. A total of 73 (41%) individuals in our overall sample reported to always use condoms during sex in the quantitative survey ($n = 178$), while in our qualitative interview sub-sample only 14 (17.3%) individuals did not report behaviors that contradicted the constant use of condoms ($n = 81$). A large percentage of these individuals reported using illicit drugs during sex (Table 1). Word cloud results within the qualitative sample (Figure 1) demonstrated a central presence of the words persons (pessoas, pessoa), sex (sexo, sexual), speak (falar), condoms (camisinha, preservativo), indicating not only a strong focus on relations with other people, but also the degree of openness obtained in our interviews.

Agreement among quantitative variables

To evaluate the quantitative component of the study, we compared the responses of the groups stating during the quantitative survey that they always used a condom during intercourse against those stating that they did not always use a condom. Compared to those not stating that they always used condoms, the former had lower percentages of high risk sex, illicit drug use during sex, sexually transmitted diseases, BIS scores, and ESC scores ($p < 0.01$).

Table 1. Sample characteristics stratified by condom use during sex

Variable	Total (81)	Does not use condom (67)	Always uses condom (14)	p
Age	36.94 (± 10.43)	36.66 (± 11.12)	38.29 (± 6.22)	0.453
Race				0.266
- White	56 (69.1%)	49 (73.1%)	7 (50%)	
- Black	15 (18.5%)	10 (14.9%)	5 (35.7%)	
- Mixed	9 (11.1%)	7 (10.4%)	2 (14.3%)	
- Others	1 (1.2%)	1 (1.5%)	0 (0%)	
Partner is HIV positive	17 (21%)	15 (22.4%)	2 (14.3%)	0.863
HIV disclosure				0.225
- Family	20 (24.7%)	17 (25.4%)	3 (21.4%)	
- Friends	15 (18.5%)	10 (14.9%)	5 (35.7%)	
- Partner	12 (14.8%)	10 (14.9%)	2 (14.3%)	
- Nobody	32 (39.5%)	29 (43.3%)	3 (21.4%)	
- Prefers not to answer	2 (2.5%)	1 (1.5%)	1 (7.1%)	
Sex preference				0.702
- Men	63 (77.8%)	51 (76.1%)	12 (85.7%)	
- Women	17 (21%)	15 (22.4%)	2 (14.3%)	
- Prefers not to answer	1 (1.2%)	1 (1.5%)	0 (0%)	
Partner number				0.004
- One	40 (49.4%)	27 (40.3%)	13 (92.9%)	
- Two	15 (18.5%)	14 (20.9%)	1 (7.1%)	
- Multiple	25 (30.9%)	25 (37.3%)	0 (0%)	
- Determined by sexual attraction	1 (1.2%)	1 (1.5%)	0 (0%)	
BIS-11 score	67.16 (± 6.94)	68.12 (±6.64)	62.57 (± 6.69)	0.011
BIS-11 motor	14.93 (± 3.55)	15.61 (± 3.32)	11.64 (± 2.71)	< 0.001
BIS-11 attention	8.07 (± 2.85)	8.43 (± 2.8)	6.36 (± 2.56)	0.013
BIS-11 no planning	-22.22 (± 2.86)	-22.13 (± 2.89)	-22.64 (± 2.76)	0.542
SCS score	24.41 (± 8.72)	25.13 (± 8.84)	20.93 (± 7.43)	0.076
Illicit drugs during sex				< 0.001
- Never	41 (39.0%)	48 (66.7%)	89 (50.3%)	
- No answer	9 (8.6%)	2 (2.8%)	11 (6.2%)	
- Sometimes	10 (9.5%)	16 (22.2%)	26 (14.7%)	
- Yes	45 (42.9%)	6 (8.3%)	51 (28.8%)	
Has a stable partner	55 (52.9%)	39 (54.2%)	94 (53.4%)	0.989
Disclose to partner that has HIV	46 (70.8%)	36 (66.7%)	82 (68.9%)	0.778
Partner is HIV positive	26 (40.0%)	13 (25.0%)	39 (33.3%)	0.130

These results internally validate our quantitative survey. In other words, these results are usually presented by quantitative researchers as a way to emphasize that the survey is coherent.

Contradictions between quantitative and qualitative responses

Although most subjects stated on the quantitative survey that they always used condoms, when confronted with the qualitative interview most made direct or indirect statements pointing to contexts where they did not make use of condoms. This discrepancy between quantitative and qualitative results was deemed a contradiction. Below we present the emerging themes related to contradictions.

Figure 1. Cloud representing overall qualitative component

Case 1 Emerging theme: Being in a similar situation

When referring to being in a situation of high risk sex, sometimes the contradiction was reported on a temporal basis, where the subject mentioned that having sex without a condom was a behavior in some non-specified past: "Years ago, yes, not nowadays, now I am more mature." In other situations, subjects readily admitted that there were episodes of sex without a condom, such as "I did go through a situation like this." Sometimes subjects avoided directly mentioning that condoms were not used, but would instead argue why they might not always use a condom: "because I've caught myself in situations like: Why do I have and other people don't?"

Case 2: Trusting

Frequently, the contradiction occurred in situations where trust, or lack of it was involved. In these cases, a sense of trust between partners was created through the use of drugs and alcohol. These situations were often initially described as mentioning another person but then pointing to the subject himself: "this happens very frequently, right? Happens if the person is drunk, depending on whether the person is drunk... I used to drink... I drank, right? I was constantly going out." In another example starting with a third person description and then moving to first person, the subject referred to his own behavior : "...sometimes they use a drug, illicit, completely lose control and there we go... If I started, then let me go all the way." This trust will often occur in contexts where the subject acknowledges that it should not occur: "and then everybody goes to a corner, bathrooms, restrooms in a shopping center, you go...

We know the places." Finally, the feeling of trusting each other is enough to not make use of a condom: "...depending on the partner I had, I wouldn't use [a condom] and would infect him or I would not know if he already had it [the infection], you know, but often I wouldn't... I wouldn't have a problem having sex without a condom in a casual encounter where the two ... no one cares about condoms, and then things will happen... "Trust frequently came at the expense of drug use, drinking (bebida) being the strongest component in drug use (Figure 2).

Figure 2. Word cloud representing the range of the discourse related to drug use and its role in trust

Case 3: Not willing

Most often, the main reason for not using a condom is simply one's unwillingness to do so, no further reasons being necessary: "since we are always together, we don't get bothered with each other ... we live together, we have sex without a condom." The reason is then described as something as simple as desire to have sex without a condom "... But he... when I asked him, he wanted to have sex without a condom..." This "why not?" attitude is reinforced by the corresponding behavior of his partner: "...I wasn't going to have sex without a condom, but why did I do it? ... why should I have a [HIV] test?" Fear of losing his partner was a frequent component in these discourses, with words such as person, loss and fear (pessoa, perda, medo) playing a central role in the narrative related to these emerging themes (Figure 3).

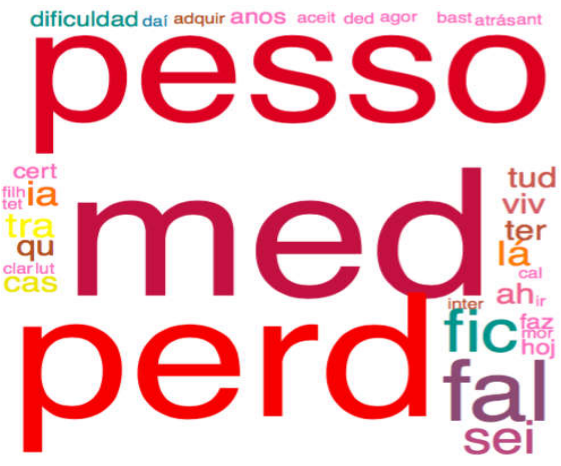

Figure 3. Word cloud for emerging themes related to non-willingness in relation to condoms

Not willing to use a condom was also related to the perception of suspicion, the emotion being frequently associated with the concept of mental difficulty (mental, difícil) (Figure 4).

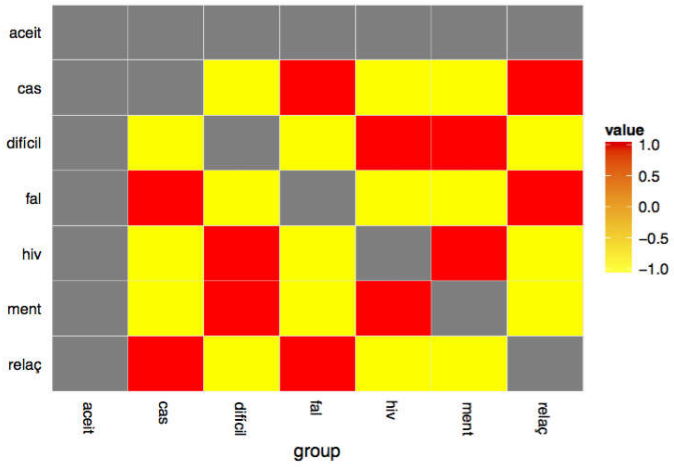

Figure 4. Heatmap relating not willing to use a condom with suspicion-related concepts

Case 4: Location darkroom

Reasons are often social encounters, a classical example being a darkroom. A darkroom is a place where people will randomly have sex with each other, without being able to identify who is who, no questions being asked about HIV status or condom use. "I work in a nightclub in [location], I worked in some famous nightclubs in [location]... there, married men went there and had sex without a condom." Darkrooms are for sexual pleasure, nothing else, no worries or guilt while in the act: "the majority of people going in are searching for something... looking for sex. That's what a darkroom is all about." In a dark room there is no holding back, any risk is an after-thought: "And then, then it's too late."

Case 5 - Extreme behavior

Some people will refer to the lack of condoms as an extreme behavior: "It's almost suicidal, a Russian roulette... carelessness... you don't care about him, about others...Yes, you will have sex with other people knowing that they have it [HIV]. ...it's a matter of chance, of probability..." This carelessness is related to an absence of fear: "lost all fear, lost all fear for many years." Others will relate this fearlessness to not loving themselves: "so, you don't love yourself, you keep violating yourself, that's it."

"What is your opinion about the use of condoms during sex?"

When asked about condoms during sex, a number of themes emerged in issues associated with losing partners, disliking the condom itself, questioning its efficacy, not having condoms available, problems controlling the excitement, and lack of information. Rushing was a frequent theme: "Guys are in a hurry, if they don't have [a condom] at hand they go away, too much talk talk and they get mad... It's not easy. They just want to fuck and that's it..." Interestingly, the rush associated with not using a condom was associated with parting (balada) (Figure 5).

Figure 5. Word cloud evaluating concepts associated with the lack of a condom

DISCUSSION

To the best of our knowledge, this is the first article describing contradictions between results from quantitative surveys and qualitative interviews regarding the frequency of condom use among HIV/AIDS-positive men who have sex with men. Specifically, these contradictions were elicited when participants reported their own behavior while making comments about fictitious situations where condoms were not used, contexts where their trustworthiness could be questioned by a partner if they were to use a condom, simply not being willing to use a condom without any apparent rationale, darkroom environments, and engagement in extreme sexual behaviors.

One possible explanation regarding the contradictions comes from the lack of connection and empathy between researchers and participants while conducting a quantitative survey. In contrast, this connection is a methodological prerequisite of good qualitative methods. Qualitative interviews are therefore considered an enhancement to quantitative surveys, their simultaneous use in mixed methods studies providing a more thorough way of understanding healthcare-related issues (Pollini *et al*., 2010; Wagner *et al*., 2012). These statements apply to our study, where responses more likely connected to actual behavior were elicited because of a high degree of empathy established between research participants and the researcher.

Although the literature on contradictions between qualitative and quantitative results is relatively scarce, some authors have expressed insights that are similar to ours. For example, a recent mixed-methods study evaluating illicit drug user behavior found discrepancies between quantitative and qualitative results related to withdrawal symptoms. Specifically, withdrawal was frequently reported in the qualitative component as a major factor driving drug use, while in the quantitative component this factor was barely mentioned (Wagner *et al*., 2010; Wagner *et al*., 2011). Interestingly, rather than using this discrepancy to justify a validity issue, the authors made use of an analytical approach attempting to understand which contexts might lead to the detection of contradictions (Wagner *et al*., 2012).

Based on our results, however, we believe that the quantitative component captures participants' description of their own behavior to others, while the qualitative description was likely closer to the way they behave in daily life. Both narratives could be deemed important from a policy-making perspective, as the public narrative elicited by quantitative surveys might lead to campaigns educating men who have sex with men about not relaxing their preventive measures simply because their partners might say in public that they are not infected. In contrast, the narrative extracted from qualitative interviews might point toward the need for an increase in the intensity of prevention programs. In other words, quantitative and qualitative results are synergistic and should be jointly obtained whenever the study involves sensitive issues, or where participants might not fully disclose their behavior in standard quantitative surveys.

Despite filling an important gap in the literature, our study does have limitations. First, our sampling for the quantitative survey and qualitative interview were not randomly selected. Although a random sample would have allowed us to make population inferences, random sampling also imposes a significant logistical burden on study logistics. Given our relatively large sample for a qualitative evaluation, our option was to focus on the qualitative interviews while leaving the sampling under a convenience strategy. Second, our study represents patients in a large metropolitan area in South America, and so behaviors in rural locations or different countries might differ from the ones we have described. Third, we did not confront patients regarding these contradictions, neither at the end of the qualitative interview nor at a follow-up interview. This procedure was justified by two reasons: First, given the complexity and length of the interview, the absence of a confrontation at the end of the first interview was not feasible. In other words, it would have been difficult to identify contradictions within the interval between participants turning in their quantitative results and the initiation of the qualitative component of the interview. Second, although a second interview focusing on the sources of contradiction would shed further light on our findings, we felt that this confrontation could also be perceived as a lack of trust between researchers and participants. Finally, collection of the quantitative data was performed in the waiting room as opposed to a private room where the qualitative interview was conducted. This decision was driven by logistical issues at the site. However, privacy was guaranteed since participants did not receive instructions in front of other patients.

In conclusion, future research studies should explore mechanisms where qualitative interviews are used to validate quantitative survey results, while also generating "correction factors" to update these very results. These correction factors could potentially allow us to obtain better estimates of what might be happening in terms of HIV/AIDS behavior in the real world, rather than focusing on reports that are simply a mirror of what respondents perceive as socially-accepted norms. Finally, from a clinical and healthcare policy perspective, this study raises awareness in relation to the accuracy and validity of results in HIV/AIDS behavior when they come exclusively from quantitative surveys.

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Statement of human rights

Ethical approval: "All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards."

Conflict of interest: The authors declare that they have no competing interests

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