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HIV TESTING AMONG SPANISH YOUTH: ANALYSIS OF THE MEDIATING ROLE OF THE BIG FIVE PERSONALITY AND OTHER PSYCHOLOGICAL FACTORS

Abstract

Early diagnosis of HIV improves the effectiveness of treatments and stops the progression of the disease. The influence of personality and other psychological variables in testing for HIV is analyzed. The first part of the study is composed of 4,929 young people (M age = 20.45, *SD* = 2.16). For the second part, young heterosexuals who participated in a broader project on HIV prevention were selected (n = 240, *M age* = 20.78, *SD* = 2.29). Only 23.3% of the total sample have ever been tested for HIV antibodies. The main reason for not testing was fear of positive result (25.4 %). Statistically significant differences in Agreeableness (p = .027), Trust (p = .022) and Straightforwardness (p = .024) were found between HIV-tested and not HIV-tested youth. Trust explained 3.3 % of variance of HIV-test. Knowing barriers to testing and individual differences could be useful in developing preventive campaigns.

Keywords: Youth, HIV antibody testing, Personality, Psychological mediators.

Resumen

El diagnóstico precoz del VIH mejora la eficacia de los tratamientos y detiene la progresión de la enfermedad. Se analiza la influencia de la personalidad y otras variables psicológicas en la prueba de detección del VIH. La primera parte del estudio incluye 4,929 jóvenes (*M edad* = 20, *DT* = 2.16). La segunda seleccionó jóvenes heterosexuales participantes en un proyecto más amplio (*n* = 240, *M edad* = 20.78, *DT* = 2.26). El 23.3 % de la muestra total se ha realizado la prueba. La principal razón para no realizársela es el miedo a un resultado positivo (25.4 %). Se obtienen diferencias estadísticamente significativas entre los que se han realizado la prueba y los que no en: Amabilidad (*p* = .027), Confianza (*p* = .022) y Franqueza (*p* = .024). Confianza explicó un 3.3 % de la varianza. Las barreras percibidas y las diferencias individuales son útiles para la prevención.

Palabras clave: Jóvenes, Prueba de detección de anticuerpos de VIH, Personalidad, Variables psicológicas mediadoras.

Introduction

According to the report on the global AIDS epidemic 2014 from the Joint United Nations Programme on HIV and AIDS (UNAIDS), 35 million people are living with HIV worldwide (1). Spain accounts for 6% of new cases diagnosed in 2013 worldwide. The transmission among MSM was the most frequent (51.1 %), followed by heterosexual transmission (30.6 %) and IDU (1.2 %). Heterosexual transmission in men accounts for 17.4 % of new diagnoses and 13.2 % in women. Spanish youth under 30 years represent 26 % of all new cases of HIV infection. The median age at HIV diagnosis was 36 years, but higher rates are occurring in the age groups of 25-29 and 30-34 years (2).

The public health strategies and interventions that have emerged in recent years have focused on preventing new infections and providing treatment to persons living with HIV. Thus, early diagnosis is necessary because it enhances the effectiveness of the treatments in HIV-positive patients and helps slow down the progression of the disease. However, the availability of the diagnostic test is not sufficient to ensure its use as public health authorities are particularly concerned about the low percentage of people who voluntarily undergo HIV testing. Some studies indicate that between 25 and 30 % of people with HIV are unaware their HIV status and that they are responsible for 54 % of new infections (3-5). In the WHO European Region the information on the magnitude of this phenomenon is insufficient. Thus, in a paper published in 2008, the rate of undiagnosed HIV infections was estimated at 30 % for Europe (6). According to the SINIVIH study in Spain, 48 % of new diagnoses were in fact a delayed diagnosis (less than 350 CD4) and 28 % advanced disease (less than 200 CD4). The profile of people who did not know their HIV status before diagnosis were patients younger than 25 years or those older than 44 years and who had heterosexual sex (7,8).

Numerous studies developed in Spain have shown a high frequency of sexual risk behaviors among young heterosexuals and homosexuals (9-15), but few studies have examined the frequency of HIV antibody testing and determinants of delayed diagnosis (16). According to the Survey on Health and Sexual Habits conducted by the National Statistics Institute, only 10.4 % of the population in Spain has been tested voluntarily to find out their HIV status (17). Similar data obtained the report from the Foundation for Research and Prevention of AIDS in Spain, with an average rate of 7.9 % testing in 18 to 29 years (women: 6.2 % and men: 9.6 %) (18). Other data are obtained from non-governmental organizations that offer rapid testing in nonclinical settings. For example, Madrid Rapid HIV Testing Group found a prevalence of HIV tests of 47% in the general population and 21.6 % of young people (women: 14.6 % and heterosexual men: 21.5 %) (19). While the Health and Sexual Behavior Survey Group found a percentage of 39.4 % (40.2 % in men and 38.5 % in women) (20). The average percentage of young people in other countries ranges between 25-30 % in America (21), 17 % in Africa (22) and less than 10 % in Peru (23) or the Caribbean (24).

Considering the contributions of social-cognitive models, multiple variables influence preventive behavior and it is necessary to explore them to understand the HIV antibody testing behavior (16). Thus, the Health Belief Model indicates the influence of perceived susceptibility to illness, perceived severity of the disease and the benefits and barriers involved in carrying out preventive behavior (25). On the other hand, the Theory of Planned Behavior, as an extension of the Theory of Reasoned Action developed by Fishbein and Azjen (26), sustains the influence of subjective norms and attitudes on the behavioral intention but stresses the importance of perceived behavioral control.

Following these theoretical models, low perceived risk of HIV infection and negative attitudes towards HIV antibody testing have been barriers to testing described in the scientific literature. Risk perceptions refer to people's beliefs about their vulnerability to danger or harm. Some authors suggest that risk perception is a central role in determining behavior and other studies identify modest associations (27). One explanation for these relatively modest associations is that characteristic measures of risk perception capture cognitive evaluations of the hazard (i.e., beliefs about the possibility of harm) but underestimate affective reactions (i.e., feelings about the possibility of harm). Some studies show that feelings of threat motivate behavior change, for example delaying sexual behavior, reducing sexual partners or increasing condom use (28,29). But the perception of vulnerability is very low and, therefore, people do not take actions to reduce the threat (30-34). This invulnerability may be the result of unrealistic optimism personal risk underestimating and overestimating the risk that other, as demonstrated in the study of Lameiras, Rodriguez and Dafonte (10). On the other hand, perceptions of severity refer to people's beliefs about how serious are the negative consequences of a hazard (e.g., AIDS). Reviews of data indicate that perceived severity is associated with perceived risk, such that intentions or behavior will best be promoted when people perceive the relevant hazard as both likely and serious. Zak-Place and Stern found that youth who perceived greater severity HIV, had no intention of undergoing HIV antibody testing. Furthermore, it has been shown that when the levels of perceived severity are so high that fear is caused, preventive behaviors are inhibited (35).

Furthermore, research with different groups has shown how attitudes towards the HIV antibody tests are an important variable that can influence their implementation (36). In most of the studies reviewed, the fear of a possible positive outcome has been

shown as the main obstacle to being tested. Within the negative attitudes mentioned are: fear of stigmatization and discrimination (37,38), loss of social status, fear of rejection from loved ones such as family members or friends (39-41) or inability to cope with the psychological and social implications of the diagnosis (42). It seems that the anxiety about the self-perceived negative consequences of testing (perhaps being HIV-positive) and perceived severity of illness diagnosed can generate some uncertainty about the decision to test (35). In the preventive field, there are significant barriers to testing, and stigmatized disease such as AIDS is associated with resistance to being tested for HIV (41,42); from the social perspective there is the barrier of discrimination to which people living with HIV are subjected (43,44). Nevertheless, positive attitudes towards the HIV antibody testing such as the possibility of adequate medical treatment or coping with the stress of an ambiguous situation are the main reasons founded in subjects agreeing to be tested (45-49).

The few studies related to HIV antibody testing in young people have focused on analyzing issues such as the psychological consequences of the process or the influence of external or cognitive factors in attempting to explain this behavior, leaving aside other individual variables such as personality traits, which are shown to be significant factors in HIV research (50). The Five Factor Model (FFM) is the commonly used personality approach. The Big Five are considered by these authors as temperament traits whose origin and development is independent of environmental influence, although its expression can be shaped by it (51). Different lines of research have demonstrated the situational consistency of the traits, genetic background, temporal stability and universal structure (52), also has served to explain risky sexual behaviors in different populations and cultures (53). As there are no studies that analyze the influence of personality variables in testing for HIV antibodies, it is expected that the

same personality dispositions (high Agreeableness and high Conscientiousness) related to preventive sexual behavior may also be linked to HIV antibody testing behavior (54). On the other hand, it is also expected that the personality variables associated with risky sexual behavior (high Neuroticism and low Conscientiousness) may have a negative influence on this behavior (55). Regarding the influence of emotional factors, a recent study noted high levels of anxiety, depression and distress in people who were tested voluntarily (56). It would also be relevant to consider the research on the coping style of patient with HIV since the HIV test may pose a stressful situation that requires adaptive strategies. In this sense, it was observed that while people with high scores on Neuroticism tend to use maladaptive strategies that focus on emotion (57), the high scores on Conscientiousness are characterized by active coping strategies (58,59).

Moreover identifying and understanding the relationships between cognitive, emotional, social and personal variables and behavior of HIV-testing is important because it could give us some clues to the mechanisms of prevention (60). Knowing these characteristics and their positive or negative influence on carrying out testing would enable us to identify which persons need special counseling (because of their risk characteristics) and know where to direct our preventive efforts, i.e. more adequately define the aspects of interventions. For this reason, this paper is divided into two sections. It firstly focuses on the prevalence of HIV antibody testing and a large sample of young people is analyzed. Secondly there is an in-depth analysis of the influence of HIV/AIDS information, perceived HIV risk, attitudes towards HIV testing and personality variables (Big Five) are assessed in a representative sample of young heterosexuals.

Methods

Participants

4,929 Spanish young people were assessed in activities organized by the Research Unit on Sexuality and AIDS (UNISEXSIDA) on the annual AIDS Day. 63 % were women (*n* = 3,107) and 37 % men (*n* = 1,822). Average age was 20.45 years (*SD* = 2.16) in a range from 17 to 26. 94.2 % considered themselves heterosexual, 3.8 % bisexual and 2 % homosexual.

Of the total sample, 430 were subsequently involved in a broader project on HIV prevention. Given that the small number of homosexual and bisexual individuals (*n* = 41) did not allow a balanced statistical sample based on sexual orientation, it was not included in the analysis. Moreover, those who did not answer the response alternatives (yes/no) of the item related to HIV antibody testing, but used non-specific words like "may be, don´t know, etc." (*n* = 149) were removed. Hence the sample was composed of 240 heterosexual youth of whom 56.7 % were women (*n* = 136) and 43.3 % men (*n* = 104). Average age was 20.78 years (*SD* = 2.29) in a range from 17 to 26. At the time of evaluation, 63 % of youth had steady partner.

Measures

Survey on AIDS (*Encuesta sobre Sida or ENSI*) by Ballester, Gil y Giménez (2007). This questionnaire consists of 25 items that attempt to gather up the various components considered to be relevant in various HIV prevention models (ie. Health Belief Model, Theory of Reasoned Action, Social-Cognitive Model or Transtheoretical Model). The instrument shows adequate psychometric properties: internal consistency measured by Cronbach's alpha was .62 and test-retest reliability was .84 (61). The composition of different subscales that assess different aspects of HIV prevention can reduce the overall data reliability of the instrument. However, both scores could be considered acceptable considering the small number of items included in its calculation

and that some authors set a minimum reliability level of .50 for research purposes (62). In keeping with the objective of the present study, the following items were selected:

- How often do you use a condom in the following situations: vaginal intercourse, oral sex, anal sex, steady partner, casual partner or when you have consumed alcohol or other drugs? The answers might be: never, sometimes, often or always (item 12).
- Do you use a different method to condoms? Which one? (item 13).
- Have you been tested for HIV? The Dichotomous response could be: "Yes" or "No" (item 24).

AIDS Prevention Questionnaire (*Cuestionario de Prevención del Sida* or *CPS*) by Ballester, Gil y Giménez (2007). This instrument was made up of 65 items divided into 6 components: information, risk perception, attitudes and beliefs, behavioral intention, risky behavior and solidarity towards people living with HIV. The internal consistency and test-retest reliability of the data were acceptable, obtaining a Cronbach's Alpha value of 0.70 and a correlation of 0.83 between test and retest. Furthermore, a good concurrent validity score of 0.79 was obtained with the Questionnaire on AIDS (*Encuesta sobre Sida*) (63). For this study the following has been used:

- Scale of HIV/AIDS knowledge, consisting of 27 items with dichotomous response, "Yes" or "No". Scores range from 0 to 27 points.
- Scale of HIV perceived risk with three items (perceived severity of HIV/Aids, perceived susceptibility to HIV/Aids and fear of HIV/Aids): AIDS is a mild, moderate, severe or fatal disease (item 7), Notes from 0 to 100: The likelihood or risk you perceive to infect with HIV (item 41), Notes from 0 to 100: what fear will produce the possibility to infect with HIV (item 43).

- Attitudes toward HIV antibody testing that included two open-response items: Indicating the major advantage that HIV testing can have (item 25) and indicating the major disadvantage that HIV testing can have (item 26). Responses were categorized considering the advantages and disadvantages found in the scientific literature.

NEO-PI-R by Costa y McCrae (1992). This is one of the most prestigious and most widely-used measurement instruments in the evaluation of the main personality factors according to the FFM. According to this model, personality is structured according to five broad factors or dimensions that identify stable and consistent response trends. In this work, the adaptation into Spanish of the questionnaire was used; the said adaptation was carried out by A. Cordero et al. (2008). The questionnaire is made up of 240 items with Likert-type responses that range from 'I totally disagree' to 'I totally agree'. The questionnaire is structured on the five dimensions of the five-factor model, as well as 30 specific facets that are included within the dimensions (6 facets in each dimension):

- Neuroticism refers to the level of emotional adjustment and instability (Anxiety, Hostility, Depression, Self-consciousness, Impulsiveness, and Vulnerability).
- Extraversion refers to the amount and intensity of interpersonal relationships, the level of activity and the need for stimulation (Warmth, Gregariousness, Assertiveness, Activity, Excitement Seeking, and Positive Emotions).
- Openness to Experience refers to the degree of intellectual curiosity, creativity, preferences for novelty, and variety (Fantasy, Aesthetics, Feelings, Actions, Ideas, and Values)

- Agreeableness refers to one's tendency to be compassionate and cooperative towards others and to one's trusting and helpful nature (Trust, Straightforwardness, Altruism, Compliance, Modesty, and Tender-mindedness).
- Conscientiousness refers to the degree of organization, persistence, control and motivation in behavior (Competence, Order, Dutifulness, Achievement Striving, Self-discipline, and Deliberation).

The S-form or self-administered method was used when applying the evaluation instrument. The version used obtained an internal consistency that oscillated between 0.83 and 0.92 (64). In this study, the reliability analysis oscillated between 0.71 and 0.89.

Statistical analysis

A descriptive analysis was carried out in the large sample of the criterion variable, HIV antibody testing. Next, the comparison between independent samples was carried out by using the t-test and Cohen's d-test on quantitative variables. Young people who had never taken the HIV test were named, Not HIV-tested (75.4%) and youth who had at some time tested were named, HIV-tested (24.6%). In addition, a correlation analysis was added to determine the relationship between personality variables and factors related to HIV information and risk perception. Following the differential study, a multivariate analysis was carried out using a multiple logistic regression analysis; this enabled us to predict or estimate the probability that a subject might find himself or herself in the situation of interest (belonging to not HIV-test group) as a function of certain individual characteristics. Logistic regression was the chosen analytical method for two reasons: (1) The conditions of multivariate normality, homoscedasticity and linearity are not required, and (2) the model may incorporate independent variables of different types (65).

Procedure

Unisexsida organized every year the AIDS Day. This day is celebrated with informative tables set up for a week to provide information on HIV. The first sample was obtained through brief surveys administered to people who expressed an interest (December 2010 and 2011). In 2012, professionals from the Unit telephoned people who were interested in collaborating with research on AIDS. Team members explained to people the project that is the basis of this work. A more extensive research project aimed at analyzing the existence of a psychological profile of risk for HIV infection in young people was envisaged. The pre-test assessment, which is used for this study was conducted between September 2012 and June 2013. Approximately 90 minutes were given to each group for the filling-out of the questionnaires. Similarly, a request for informed consent was made to all participants and they were also informed of the content of the Spanish data protection law known as *Ley Orgánica de Protección de Datos (LOPD)* to guarantee the confidential nature and treatment of the data obtained.

RESULTS

1. Sexual risk behavior and prevalence of HIV antibody testing in youth (N=4.929).

Young people have had sex with an average of 3.74 (*SD* = 5.31) individuals throughout their lives. 82.4 % have sex in the present with an average frequency of 1-3 times a week. The most common sexual practices were vaginal penetration (89.3 %), mutual masturbation (70.1 %), oral sex (69 %), masturbation (58.9 %) and anal penetration (16.2 %). A 36.6 % of young people reported not using condoms consistently for vaginal intercourse, 63.4 % in anal intercourse and 92.8 % in oral sex. By type of couple, 46.1 % have not used condoms consistently with their steady partner while 25.1 % did not do so with their casual partner. Finally, 46.2 % did not use condoms consistently when under the influence of alcohol and drugs. 28.1 % reported

using other methods, mainly the pill (74.3 %). Only 23.3 % (*n* = 1.150) of young people have ever tested. Statistically significant differences were found according to sex (Chi^2 = 30,630; *p* = .000), a higher percentage of men (27.4 %; *n* = 500) than women (20.9 %; *n* = 650) report that they have tested. Statistically significant differences were obtained on the basis of sexual orientation (Chi^2 = 6.629, *p* = .036). A higher proportion of homosexual (34.9 %) and bisexual (32 %) were tested compared to heterosexuals (25.8 %). Statistically significant correlations were also obtained with positive sign between age and HIV testing (*Rho* = 0.184, *p* = .000).

2. HIV knowledge, HIV perceived risk, attitudes towards HIV antibody testing and the Big Five in HIV-tested vs. not HIV-tested youth (N = 240).

Both groups obtained mean scores on HIV/AIDS knowledge; low scores on HIV perceived susceptibility to HIV/Aids and high scores on fear of HIV/Aids and in perceived severity of HIV/Aids. No statistically significant differences were found in any of the three variables. The magnitude of the size effect is low in all the variables analyzed (see Table I).

INSERT TABLE I

Analyzing the attitudes towards HIV testing, both groups (Not HIV-tested: 45.6 %; HIV-tested: 43.1 %) did not perceive any disadvantages in accepting the test. The main reason for declining HIV testing for both groups was the fear of obtaining a positive result (Not HIV-tested: 27.2 %; HIV-tested: 29.3 %). However, other reasons emerged even with a lower percentage: amount of time needed (Not HIV-tested: 5.7 %; HIV-tested: 3.4 %) or fear of discrimination (Not HIV-tested: 6.3 %; HIV-tested: 3.4 %). The major advantages associated with being HIV tested for both groups were: knowing one's health status (Not HIV-tested: 43.6 %; HIV-tested: 37.3 %). Some advantages that young people named were: the prevention of transmission to others

(Not HIV-tested: 18.6 %; HIV-tested: 22 %), the possibility of calming down (Not HIV-tested: 14 %; HIV-tested: 22 %) and access to treatment (Not HIV-tested: 5.8 %; HIV-tested: 8.5 %).

With respect to personality factors, both groups are in the mid-range on the N, E and O, in the medium-low range on the C, and in the low-range on the A, compared with the normative sample. Statistically significant differences were obtained only in the A domain, Trust (A facet) and Straightforwardness (A facet), which is characteristic of the people who have not been tested. The magnitude of the size effect is low in all cases (see Table II).

INSERT TABLE II

An analysis was done to establish whether or not there was a relationship between the three personality traits that have obtained statistically significant differences, and the variables discussed above. In the analysis of correlations statistically significant relationships were found between Agreeableness and perceived severity of HIV/Aids (*Rho* = -0.173; p = .007), and with condom use in oral sex (*Rho* = 0.158; p = .021). Similarly, Straightforwardness correlated significantly with: perceived severity of HIV/Aids (*Rho* = -0.190; p = .003), condom use in vaginal intercourse (*Rho* = 0.137; p = .039), with steady partner (*Rho* = 0.184; p = .006) and under the influence of drugs (*Rho* = 0.142; p = .048).

Following on from this, a logistic regression (forward stepwise method) with the independent variables that had previously obtained statistical significance was performed. The dependent variable of the study is the behavior of the HIV antibody test. Value 1 to the event of interest was assigned, that is, young people who were not HIV tested. While the value 0, represent the young who did were HIV tested. The value of R square Naglekerke indicates that the proposed model accounts for 3.3 % of the variance

of the dependent variable (.033). This equation generated only one explanatory variable which were the Trust, Agreeableness facets, which appears as a risk factor. The value of the OR indicates that with an increase of the value of the independent variable, there is also an increase of the dependent variable. Trust multiplied 1,040 times (4 %) the probability of not HIV testing. Hosmer-Lemeshow test did not obtain statistical significance (Chi^2 = 14.700; p = .065), indicating a goodness of fit of the model. There is a 75.4 % probability of success in the outcome of the dependent variable. The score of statistic efficiency ROA indicates a significant improvement in predicting the probability of occurrence of the categories of the dependent variable (Chi^2 = 5.309; p = .021).

Discussion

Being young and having heterosexual sex are risk factors for HIV infection and delayed diagnosis in Spain (7,8). Young people account for about 30% of new infections (2). Many studies are showing the high percentage of risky sexual behaviors in this sample and the low prevalence of preventive behaviors (9-15). In this sense, the low rates of HIV test obtained in our study (23.3 %) are similar to those found by other authors in Spanish or American youth (between 25% and 30%) (17-21), and higher than those found in African (about 17%) or Latin American youth (less than 10%) (22-24). Our data confirm findings by other national-based entities, namely that heterosexuals and particular, women, present a lower percentage of diagnostic testing (17-20). HIV has a chronic outcome that is conditioned by the deterioration of the patient's immune system. Ignorance about HIV status does not allow people living with HIV to benefit from the treatment and therefore the likelihood of developing AIDS and dying from it increases; furthermore, the fact is that they can spread the infection without knowing it. Some studies show that as many as 54 % of new infections that

occur are due to the 25 % of sexually active people who were unaware they were HIV-positive (6-8).

Providing adequate and accurate information remains one of the fundamental aspects of HIV prevention. The young people in our study show an average level of knowledge about HIV. Perhaps, having good information on HIV may facilitate risk assessment. Not knowing the practices of HIV transmission or having erroneous beliefs about preventive measures (e.g., use of other contraceptive methods, saying they have a steady partner, etc.) could skew the perception of risk. The phenomena of underestimation of risk, risk habituation or the illusion of invulnerability have been studied in the literature (9,10). The young evaluated show a low perception of risk, consider AIDS as a serious illness and are afraid of a possible HIV infection. However, none of these three variables have appeared as a significant factor in the behavior of getting tested (27). At this point, we should consider whether it may have influenced what Bayés called, the *hedonistic nature of human beings*. This is the importance of time elapsed between the behavior taking place and its consequences. Accordingly, sexual risk behaviors are followed by immediate and somehow, by positive consequences (obtaining pleasure). Following from this, negative consequences are only probable, and also long-term. In effect, the immediate and short-term outweigh the positive impact on our behavior with regard to the possibility of serious and negative consequences in the future (66).

In spite of all this, young people do show considerable fear of HIV, which is closely related to the consideration they have of AIDS as a serious or fatal disease. Perhaps that is why youth report disadvantages of the HIV test as fear of the social and psychological consequences of a positive result. The stigma associated aggravates the negative view that young people have of the disease. This catastrophic social perception

has been found to be the main reason for not testing in a recent review in Europe (67). Concerns about the AIDS stigma would affect the young person's own decision to be tested for HIV as noted by some studies. For example, about 89 % of the sample evaluated in the research by Swendeman et al. said to have perceived stigma, characterized by avoidance, social rejection, shame and abuse, and 31 % reported having experienced it in the last three months (46). Moreover, a large percentage of participants in the study by Young and Bendavid attended health services to seek other medical tests done under the guise of testing for HIV to avoid the perceived stigma (44). In Spain, a national survey reports that one in three Spaniards declare that they would not study or work with a person with HIV. Subsequently, other studies found that 18.3 % of Spaniards would not want their children to be in the company of or leave the care of their children to an HIV-positive person; 40.1 % would change his/her son or daughter from school if his/her child had a schoolmate with HIV. Furthermore, 20 % of the population believes that the law should require that, in certain places, people with HIV ought to be separated from the rest of the population to protect public health (47,48). The young people evaluated have also identified positive reasons associated with testing, mainly to know one's health status and, to a lesser extent, to prevent transmission to others, to attain inner peace and to get access to treatment. However, the low prevalence of testing gives us an idea of the weighting of the perceived disadvantages regarding the benefits of testing.

Regarding the personality profile, only one domain and two facets, of the 30 specific traits measured in the Revised NEOPI, have obtained statistically significant differences. Given these data, it would be appropriate to mention the skeptical claims concerning traits theories in which authors such as Caprara and Cervone or Borsboom, Mellenbergh and Van Heerden are an example (68,69). These perspectives were

considered as insurmountable limitations in explaining behavior, given that dispositional tendencies do not have a causal status. We should consider the more flexible stance defended by McAdams who proposes three levels of analysis (70). This author would place the features in Level I, that is, the comparative, stable, relatively decontextualized and generalized dimensions. These features thus provide the first insight into people and the individual would be located within a general framework in a number of socially significant dimensions. In this sense, McCrae and Costa pushed for an update of its more inclusive model which added a variable called "characteristic adaptations", which denotes the ways in which traits are manifested in a determined environment, culture or stage of life (71).

In our study, people who have not tested for HIV antibodies score higher on Agreeableness, Trust and Straightforwardness (but in a moderate-low range). Of these, Trust was the only variable that predicted HIV test behavior. In other studies Agreeableness appears as a protective variable in its high-rank and as a risk factor in its low-rank (54, 55, 60). In the same works, these facets appear related to lower condom use, increased frequency of couples, drug use in the context of sex or infidelity. According to some studies, Agreeableness stood out as being the most consistent predictor of perceived susceptibility to health risks as well as of health-risk behaviors, which is not replicated in the youth sample of this study. The trait of Agreeableness has an implicit interpersonal character associated with components of empathy, cooperation, openness, altruism and conciliatory attitude (64). In addition, A person's dispositional tendency to trust entails expecting the same from others and the world. Moreover Trust is integral to the idea of social influence: it is easier to influence or persuade someone who is trusting. This result serves to redirect our thinking towards studies that emphasize the importance of the type of couple. This higher expectation is reflected in

the higher propensity to trust their partner. In the present study, 63 % of young people have a steady partner. As shown in our sample, there are people who are always protected when they have sex with an unknown person (74.9 %) and people who have unsafe sex with a known person (46.1 %). In a casual partner the perception of risk is usually greater, but in a steady partner, it diminishes or disappears when members feel safe with the other. This false sense of safety, called by many authors as *the phenomenon of serial monogamy*, is to have exclusively monogamous relationships, which last for a limited time. At the end of a relationship, another one is started, also monogamous, exclusive, and so on. This makes the partners feel safe about STIs, and therefore consider protection as unnecessary. As time passes, the risks are cumulative and encompass future partners (9,10).

In conclusion, our results may be further evidence of the existence of other elements involved in performing a specific behavior. Although there is ample scientific evidence regarding the association between personality and different health behaviors, there is scarce and ambiguous evidence available about the possible role of personality variables in the process of decision making leading to a given behavior (72). Bermúdez, Lasa and Contreras suggests that there may be limited predictive utility in the global dimensions of personality in relation to specific behaviors, unless they take into account the psychological processes and contextual dimensions that mediate the relationship between general dispositional variables and behavior (73). Behavior is a complex structure of dynamic relationships between psychological processes and contextual factors, which reflect the specific manner in which the individual attempts to cope with the changing realities of the moment (74). Thus, sexuality and behavior that are performed around it, cannot be understood static and decontextualized manner, but as a

complex product constantly interacting dynamism in the person, the situation and context of the relationship.

Limitations

A possible limitation of our study is that the cross-sectional nature of the design and the use of retrospective self-reporting measurements may significantly limit the strength of the results. However, it is considered unlikely that recall bias appears in this respect due to the low frequency of the assessed behavior and on the other hand, this method is the most commonly used in the studies cited.

Implications and contribution

The reality is that our behavior affects multiple mediating factors and, once identified, allows us to partially explain the non-preventive behaviors, understand them better and plan adjustments through preventive interventions. There is a need to consider all these elements to enable young people to develop the ability to make responsible decisions. Our results highlight the importance of identifying how different population perceive risk for HIV infection. This approach has the aim of providing a basis for designing appropriate strategies in promoting and health education and risk communication. For example, there is a need to demystify the safety of serial monogamy. Furthermore, in many cases, attitudes and behaviors are reinforced by their partner, group of friends or sociocultural context. Not to attribute a positive value to preventive behaviors is supposed hinder its adoption. It would be appropriate to include in prevention programs a section aimed at reducing the stigma associated with AIDS and a preventive campaign with positive messages about the advantages of the HIV testing.

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Table
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Table I.

HIV/AIDS knowledge and perceived risk to HIV infection by group

Variable	HIV-tested[a]		Not HIV-tested[b]				
	M	*DT*	*M*	*DT*	*t*	*p*	*d (IC lower; higher)*
HIV knowledge (0-27)	15.94	3.41	16.63	3.67	1.156	.249	-0,190 (-0,484; 0,103)
Perceived susceptibility to HIV/Aids (0-100)	19.75	24.99	19.69	24.75	-0.013	.990	0,002 (-0,291; 0,296)
Fear of HIV/Aids (0-100)	78.25	32.06	72.24	34.82	-1.095	.275	0,175 (-0,119; 0,469)
Perceived severity of HIV/Aids (1-4)	3.34	0.48	3.34	0.57	-0.028	.978	0,000 (-0,293; 0,293)

[a] $n = 59$; [b] $n = 181$

Table
Click here to download Table: Table II.docx

Table II

NEO-PI-R domain and facet T-scores for youth who have been tested and those that have not been tested for HIV

	HIV-tested[a]		**Not HIV-tested[b]**				
Domains and facets (NEO-PI-R)	*M*	*SD*	*M*	*SD*	*t*	*p value*	*d (IC lower; higher)*
Neuroticism (N)	53.10	9.90	52.75	9.75	-0.239	.813	0,035 (-0,258; 0,329)
Anxiety (N1)	49.86	9.44	49.92	10.22	0.039	.969	-0,006 (-0,299; 0,287)
Hostility (N2)	54.59	10.79	52.84	9.32	-1.202	.231	0,179 (-0,114; 0,474)
Depression (N3)	51.49	10.22	51.71	10.12	0.145	.884	-0,021 (-0,315; 0,272)
Self-consciousness (N4)	53.59	9.92	52.84	8.87	-0.550	.583	0,081 (-0,212; 0,375)
Impulsiveness (N5)	52.79	10.27	52.15	9.25	-0.450	.653	0,067 (-0,226; 0,360)
Vulnerability (N6)	52.24	10.93	53.09	9.49	0.583	.560	-0,085 (-0,379; 0,207)
Extraversion (E)	50.44	11.04	49.18	10.02	-0.816	.415	0,122 (-0,171; 0,416)
Warmth (E1)	46.56	9.64	46.90	9.44	0.811	.811	-0,035 (-0,329; 0,258)
Gregariousness (E2)	45.69	11.00	47.38	8.96	1.184	.238	-0,177 (-0,471; 0,116)
Assertiveness (E3)	53.03	11.04	50.30	10.78	-1.679	.094	0,251 (-0,043; 0,545)
Activity (E4)	50.08	8.92	49.12	9.29	-0.698	.486	0,104 (-0,189; 0,397)
Excitement Seeking (E5)	57.78	9.62	55.80	8.97	-1.445	.150	0,216 (-0,078; 0,510)
Positive Emotions (E6)	49.52	10.00	47.93	10.49	-1.024	.307	0,152 (-0,141; 0,446)
Openness (O)	51.56	11.21	49.37	9.98	-1.455	.147	0,212 (-0,082; 0,506)
Fantasy (O1)	52.00	10.59	50.40	9.44	-1.094	.275	0,163 (-0,130; 0,458)
Aesthetics (O2)	48.73	10.05	46.45	9.72	-1.552	.122	0,231 (-0,062; 0,526)
Feelings (O3)	50.58	10.24	49.13	9.96	-0.964	.336	0,144 (-0,149; 0,438)
Actions (O4)	51.85	9.99	50.63	8.53	-0.912	.363	0,136 (-0,157; 0,430)

Ideas (O5)	52.93	10.05	50.41	10.27	-1.647	.101	0,245 (-0,048; 0,540)
Values (O6)	49.96	10.02	52.05	10.41	1.348	.179	-0,202 (-0,496; 0,092)
Agreeableness (A)	39.78	9.41	42.95	9.52	**2.226**	**.027**	-0,332 (-0,628; -0,037)
Trust (A1)	43.56	9.06	46.62	8.75	**2.312**	**.022**	-0,345 (-0,641; -0,050)
Straightforwardness (A2)	42.07	9.06	45.52	10.50	**2.267**	**.024**	-0,338 (-0,633; -0,042)
Altruism (A3)	44.69	9.70	45.59	9.80	0.615	.539	-0,091 (-0,385; 0,202)
Compliance (A4)	43.12	9.22	44.47	9.37	0.969	.333	-0,144 (-0,438; 0,149)
Modesty (A5)	43.12	9.79	45.84	10.55	1.754	.081	-0,261 (-0,556; 0,033)
Tender-mindedness (A6)	42.52	7.99	43.67	9.42	0.838	.403	-0,126 (-0,420; 0,167)
Conscientiousness (C)	44.25	10.79	44.95	10.22	0.448	.655	-0,067 (-0,361; 0,226)
Competence (C1)	48.69	10.54	48.81	10.06	0.072	.943	-0,011 (-0,305; 0,282)
Order (C2)	47.73	10.71	47.69	9.74	-0.022	.983	0,004 (-0,289; 0,297)
Dutifulness (C3)	44.08	9.98	43.56	10.12	-0.345	.731	0,051 (-0,242; 0,345)
Achievement Striving (C4)	43.35	11.04	44.29	10.60	0.580	.563	-0,087 (-0,381; 0,206)
Self-discipline (C5)	45.71	10.94	46.31	10.73	-0.373	.710	-0,055 (-0,349; 0,238)
Deliberation (C6)	43.89	9.28	45.21	8.82	0.983	.327	-0,147 (-0,441; 0,146)

[a] $n = 59$; [b] $n = 181$