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## Determinant factors of knowledge, attitudes and practices regarding STD/AIDS and viral hepatitis among youths aged 18 to 29 years in Brazil

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**Abstract** *The scope of this study was to evaluate the vulnerability of Brazilian youths to STDs/HIV&AIDS and Viral Hepatitis. Interviews were conducted with 1,208 youths aged 18 to 29 in 15 states and the Federal District. The regional and national adjusted margin of error of the research was 2.8%. The study was approved by the School of Medicine of Brasilia University with support from PAHO and the Ministry of Health. A scale with 35 questions (knowledge, attitudes and practices) was the main dependent variable. Adjusted linear regression models identified the demographic and social determinant factors that explain scale variations. The scale attained a satisfactory level of consistency (Cronbach's Alpha: 0.689). Socio-demographic factors associated to scale variations include gender, race, education and civil status. Social determinants associated to scale variations include frequency of discussions about sexuality with parents and health professionals, alcohol consumption, leisure and being part of a social movement, access to the internet, interest in learning and having the father and/or teacher as a personal reference. Brazilian youths are vulnerable to the transmission of STDs/HIV&AIDS. Public policies are needed to promote the engagement of parents and teachers in issues related to sexuality. Key words Brazilian youths, STDs/ HIV&AIDS, Social determinants, Vulnerability*

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## Introduction

In 10 Brazilians, four are between 15 and 29 years old. There are 50 million young people<sup>1</sup>. For that segment, according to a study conducted by Unesco<sup>2</sup>, the main challenge regarding DST/AIDS is to modify the behavior, taking into consideration the affective and privacy aspects already deep-seated to the socio-cultural standards. On the other hand, the youth is one of the most intense and rich periods of life, inviting to experimentation and aging. That's why it is a delicate phase with respect to infection by diseases, especially sexually-transmitted diseases.

A survey of Knowledge, Attitudes and Practices (PCAP), conducted by the National Department of DST/AIDS and Viral Hepatitis of the Brazilian Department of Health<sup>3</sup> showed progress, but made it clear the gaps where the behaviors in relation to DST/AIDS are required to evolve. In relation to the progress, the research report indicates that "investment in the implementation of actions in health services and in schools and support for the work of NGOs have been primordial in the achievement and maintenance of high levels of knowledge of the population".

In the meantime, a major gap are strategies that strengthen the protection of sexually active individuals according to their conditions of risk and vulnerability. The study shows that only 30.7% of young people from 15 to 24 years old interviewed used condoms in all their sexual relations with fixed partners, and only 49.6% in the segment used a condom in all sex relations with casual partners in the last year on the study.

According to the Brazilian Department of Health<sup>4</sup>, there is a tendency of growth of HIV infections in that public. After the peak of records verified in the 90s, the incidence of the disease dropped, especially in the female public. But that number has increased again since 2007, reaching 44.35 records for each group of 100 thousand inhabitants, adding men and women between 20 and 29 years old.

Such data are indicative of a still unsettling scenario. Young people, although they use condoms in a higher level than older aged segments, have not incorporated its use on a regular basis yet, showing vulnerability when it comes to sexual behavior and other socio-economic determinants.

Therefore, it is important to provide and develop studies allowing researchers and policymakers and social investment managers to create

solid, specific and long-term strategies in order to transform young people behaviors. It is necessary to build up paths that allow them to incorporate the use of condoms in an enjoyable way to their lifestyle.

In addition, young people have faced major socio-demographic and epidemiological changes over the past 20 years<sup>5</sup>. While there have been a decrease in fertility rates in the countries, there is also a greater availability of birth control methods, condoms and sex education. In other words, the increased rates of sexually transmitted diseases and teenage pregnancy and the increased availability of reproductive health products, seem to be correlated to a limited way.

One of the main reasons of that association apparently limited is the fact that the technological answers for these problems seem not to be enough to promote a lasting change of behavior, especially for unprotected sex. The change of behaviors is not characterized by the practice on time, but the regular one, when internalized by the individual in his/her daily life. Therefore, it is important to know at what level knowledge, attitudes and practices about DST/AIDS of Brazilian youth are.

The identification of the knowledge, attitudes and practices that expose young-adults to a greater vulnerability will provide relevant subsidies for the formulation, implementation and assessment of public policies on reproductive health and STD/AIDS, as well as strengthening initiatives, projects and business programs and international development, working for the transformation and incorporation of healthy reproductive sexual habits.

In this context, a protocol has been submitted to and approved by the Ethics Committee of the School of Medicine of Universidade de Brasília, with the main purpose of investigating the main determinants and the current state of Knowledge, Attitudes and Practices (KAP) STD/AIDS and Viral Hepatitis among young people from 18 to 29 years old in Brazil. The research has been officially approved and followed up by the Pan American Health Organization (PAHO) and the Department of STD/Aids and Viral Hepatitis of the Brazilian Department of Health.

The study shows which factors are determinant for the young to adopt a proper attitude in relation to sexual health and AIDS prevention. These findings could serve as a guideline to entities interested on the matter and to the federal government, in order to improve knowledge, attitudes and practices of young people in relation

to sexually transmitted diseases, HIV / AIDS and Viral Hepatitis.

1,208 young people between 18 and 29 years old have been heard in 15 states and in the Federal District, all of whom signed an Informed Consent Form (ICF) as approved in the study protocol. Young people were interviewed at home. The margin of error of the survey regional and nationally adjusted was 2.8%. Women accounted for 55% of the sample, while men accounted to 45%.

The survey was conducted with a probability sample of households obtained in four stages: primary units, states; secondary units, municipalities; tertiary units, census tracts; and finally households. The territorial division and the sectoral mesh from IBGE<sup>6</sup> Census 2010 were adopted for the selection of primary and secondary units.

It is noteworthy that this study analyzed the vulnerability of young people regarding the sexual transmission of STD / AIDS. Other forms of contagion have not been investigated, as the transmission from an infected mother to her child during pregnancy, childbirth or breastfeeding; using the same contaminated syringe or needle by more than one person; transfusion of infected blood; or non-sterilized sticking or cutting instruments.

## Methods

The main hypotheses investigated in the study were as follows:

- *Null hypothesis 1 (Ho1):* Sexual Health Levels, Reproductive Health and STD/AIDS (KAP) do not differ by gender, age, race, education, sexual orientation and socioeconomic status;

- *Null hypothesis 2 (Ho2):* The variance between the levels of Sexual Health, Reproductive Health and STD/AIDS are not explained by age of the first sexual intercourse, age of the first sexual (education) intercourse, sex education source, number of sexual partners and/or marital status;

- *Null hypothesis 3 (Ho3):* The Sexual Health Levels, Reproductive Health and STD/AIDS do not differ by constructs of family relationships, interpersonal relationships, access to public policies of education and health and other health and social behaviors (e.g. consumption of alcohol and other drugs);

- *Null hypothesis 4 (Ho4):* The Sexual Health Levels, Reproductive Health and STD/AIDS do not differ among the five regions of the Brazil.

A scale of Knowledge, Attitudes and Practices (KAP<sup>7</sup>) was developed specifically for HIV/AIDS, STD and Viral Hepatitis, which includes 17 knowledges, 10 attitudes and 08 practices, totaling 35 variables. In order to be completed, that final Scale was analyzed for validity and consistency after performing a pre-testing of the Scale-derivative questionnaire with 30 respondents from 18-29 years old, living in the Distrito Federal/DF, which signed an informed consent form.

On the Scale validity, its variables were submitted to reviewers and scholars on the matter, coming from the Brazilian Department of Health and the Pan American Health Organization (PAHO), who analyzed in detail, considering their experiences on the subject matter, and they will also take part in the subsequent step, which was the Consistency analysis. On the level of consistency of the Scale, its Cronbrach's alpha was 0.689.

The following gives some examples of variables contained in the final Scale. The full questionnaire is attached.

### *Knowledge:*

- Believe that it is necessary to use a condom even when the relationship is [SIC].
- Properly identify, within a list of diseases, which are the sexually transmitted ones.
- Know that a healthy-looking person may have AIDS.
- Know that the consumption of alcohol or drugs can cause people to have sex without using a condom.

### *Attitudes:*

- Fully agree that women may propose the use of condoms.
- Deemed to have a low risk of contracting an STD.

### *Practices:*

- The consumption of alcohol or drugs have already caused you to have sex without using a condom.
- You do not consider embarrassing to ask for condoms in pharmacies or health care units.
- You have already been to a doctor to inquire about issues related to STD-AIDS.

Considering these 35 variables, a young person could get the maximum score on the KAP scale of behavior regarding STD/AIDS (+35 points) if he/she answered to all of these items correctly. The opposite might also happen: a person who got all KAPs wrongly would be with -35 points on the scale, and might be more vulnerable to a sexually transmitted infection.

So, a questionnaire was generated from the scale, being pre-tested with 30 individuals and

adjusted as to the suitability of language content, filling time, collection approach, content validity issues raised by the main researchers and members of PAHO and the National Department of STD/AIDS and Viral Hepatitis, in addition to consistency aspects related to variables that most statistically contributed to the consolidation of Knowledge, Attitudes and Practices domains.

Questionnaire and effective data collection pre-testing procedures were made in the second half of 2011. The sample used was of the probabilistic kind and was comprehended by young people between 18 and 29 years old from all regions in Brazil. The questionnaires were applied in households according to a raffle using census units of the Brazilian Institute of Geography and Statistics - IBGE.

The sample was comprehended by 1.208 young persons aged between 18 and 29 years old, in 15 states and in the Distrito Federal, and the sampling error was set at 2.7%, based on a significance level of 95%. The sampling procedure also used of stratification by municipalities size in 3 categories: up to 50 thousand inhabitants, from 50 thousand to 500 thousand inhabitants and above 500 thousand inhabitants. In short, the sampling process had four steps, the first one embracing the states, then municipalities, census sectors later, following a simple randomization, and finally IBGE coming to households by a systematic selection.

During the implementation of the survey, all the questionnaires receiving effective Signatures on the Informed Consent Form were taken into consideration. The consent from parents or legal guardians was not required, as it was a research only with young people who had reached legal age.

After data collection, a database was generated in Microsoft Excel and, after typing, three members of the research team were responsible to check possible inconsistencies and release errors. Upon the confirmation of database consistency, the worksheet was exported to the STATA 9.0 system to carry out the statistical analysis of the data.

Two approaches of statistical analysis were used: exploratory and explanatory. For the exploratory analyses, averages, confidence intervals and tests of normality were performed for the variables that make up the study scale (dependent variable). In addition, the socio-demographic profile of the sample and other independent variables, such as the main source of sex education, access level to health services, personal references,

and history of drug and alcohol use and frequency of sexual intercourse were also analyzed.

For the explanatory analyses, the normality of the distribution of the main dependent variable (KAP scale) was firstly analyzed, and after checking the non-normality, the *Generalizing Estimation Equation* (GEE) model was used. For GEE regressions, non-adjusted models (variable to variable) and an adjusted model were generated, only including the socio-demographic profile of the respondents. After the definition of the adjusted model, the independent variables of the study (source of sex education, access level to health services, personal references, history of drug and alcohol use and frequency of sex intercourse) were tested one by one to check for statistical significance.

In addition, due to the complexity of the sampling design, it was required to correct the estimates. Therefore, based on the weighing variable generated over the young population surveyed, correction commands were used for drawing random simple sampling with post-stratification.

Before processing and statistical analysis of the data, the individual weighting of the observations arising out of the sampling process proposed had been performed. Thus, deviations between the intended design and the one executed were corrected.

## Results

By the sampling obtained, most young people were female (55%), classifying themselves as browns or afrodescendants (56%), having complete high school (43.46%) and working (60%). However, only 17% continued studying after high school, 70% did not study, and the earnings of 62.4% of the young people do not exceed two minimum wages.

In relation to sexuality aspects, 93% said they have had sex in the last 12 months, 21.9% mentioned friends and colleagues as the main source of sex education. Parents or guardians play that role in 20.1% of cases. 34.7% have the mother as the main source of support when they need to talk about personal problems. The father appears only in sixth place, 6.5% behind friends, partners and brothers. Moreover, while 54.3% say they always or almost always talk to parents or guardians, the least covered subjects are violence, drugs and sexuality.

From the 35 variables included in the scale of knowledge, attitudes and practices (KAP) for use

in the model, some exploratory results include (95% CI):

*Knowledge:*

- 40% of respondents do not consider the use of a condom a very effective method of preventing STD/AIDS or pregnancy.
- 24% still think they can get HIV/AIDS through saliva.
- 15% of young people think that malaria, dengue, leprosy or tuberculosis are STD.

*Attitudes:*

- 40% of respondents think that it is not necessary to use a condom when the relationship is stable.
- 23.3% of respondents think being faithful to a partner does not diminish the chances of contracting STD.
- Approximately 20% of young people would feel insulted or angry if their sexual partner wanted to use a condom when having sex.
- Man is 2.5 times more likely to declare himself as homosexual than the woman. In turn, women are 2.2 times more likely to declare themselves as bisexual than men.

*Practices:*

- 36.1% did not use a condom the last time they had a sexual intercourse.
  - Only 9.4% went to a health center in the last 12 months for information or treatment to STD.
- For the calculation of the average age of “loss of virginity”, the Kaplan-Meier model was used.

The analyses carried out by means of the model showed that the average age of loss of virginity is 17 years old (95% CI 16.75, 17.21). Among teenagers, the average age reached 17.4 years for young women and 16.5 years for young men.

Using the scale score congregating all 35 KAP variables of the study, young Brazilians have obtained an average score of 14.03 points. The total score of knowledge variables reached 8.02. Adding to it the score only of Attitudes (4.64), it reaches 12.66 points. And adding the Practice punctuation (of just 1.37 points), it reaches the final average of the scale, of 14.03. That is, the lowest individual scores are related precisely to the attitudes and practices of respondents. So it is verified that young Brazilians have a reasonable knowledge of STD and AIDS. However, when it comes to mood or effective prevention of an infection, the vulnerability is bigger.

Based on this result, first, non-adjusted and adjusted regression models were developed to test possible associations between sociodemographic factors and the variation in KAP scale of

STD/AIDS and Viral Hepatitis. Results are shown in the Table 1.

Therefore, regarding the sociodemographic profile, there have been four associations found in the following order of significance:

- *Being a Man* causes the young person to have fewer points 2.15 on the Scale. In other words, it means that Brazilian young women are less likely to adopt risky sexual behavior than young men of the same age group.
- *Being an Indian (native Brazilian)* causes the young person to have fewer points 4.01 on the Scale. It can be said that indigenous young people are more vulnerable than other young people in knowledge, attitudes and practices of STD/AIDS. They have less access to information on the matter and it is possible that such information, translated by prevention and other materials, are required to be better customized for that population.

- *Being Married or Living Together* makes young people more vulnerable. Being Married [SIC] in 1.73 points, regardless of gender and age. Living together, on the same line, makes young people more vulnerable in 1.55 points. That is, a young married person or living with another partner is less prevented not only regarding the use of a condom, but searches for less information on STD/AIDS than singletons. Negotiation for using a condom is still a taboo in stable relationships.

- *Having Low Educational Level* is a significant factor of vulnerability. Not having studied causes the young person to be more vulnerable in surprising 11.47 points compared to other young people. Having incomplete elementary school makes young people to be more vulnerable to STD/AIDS in 2.78 points. Having only complete elementary education makes it worse in 2.05 points, and having incomplete elementary school makes them more vulnerable in 1.52 points. All in comparison with young people who have complete high school.

Using the adjusted model of sociodemographic factors as a basis, other linear regression models were tested to check possible associations between social determinants (source of sex education, conversation habits about sexuality with parents and teachers, etc.) and variations in KAP scale of STD/AIDS and Viral Hepatitis.

Based on these models, the following social determinants reached a statistical significance to explain variations in KAP scale of STD/AIDS and Viral Hepatitis.

- *Having the habit of talking about sex with the parents or health professionals*

**Table 1.** Sociodemographic Factors and Variation in KAP scale.

KAP scale Multivariate Regression	Coefficient	95% Confidence Interval		P > t
Age	0.12	- 0.02	0.27	0.097
Man	- 2.15	- 3.08	- 1.22	-
<b>Indian (Native Brazilian)</b>	<b>- 4.01</b>	<b>-7.63</b>	<b>- 0.38</b>	<b>0.030</b>
Afrodescendant	0.24	- 1.01	1.50	0.706
Brown	0.24	- 0.76	1.24	0.636
Asian	0.14	- 3.22	2.93	0.927
Other race	- 0.19	- 1.89	1.52	0.830
Family Income	- 0.00	- 0.00	0.00	0.637
Personal Income	- 0.00	- 0.00	0.00	0.812
Marital Status				
Legally separated	<b>-0.97</b>	<b>- 3.74</b>	<b>1.80</b>	<b>0.492</b>
<b>Living together</b>	<b>- 1.55</b>	<b>- 2.87</b>	<b>- 0.24</b>	<b>0.021</b>
<b>Married</b>	<b>-1.73</b>	<b>- 2.81</b>	<b>0.65</b>	<b>0.002</b>

Reference: Woman, white, single, Catholic, high school concluded, studies, not reprovved and straight.

Despite friends being the source of sex education most mentioned by young people, they're not the ones associated with a positive variation in KAP scale. Having parents and health professionals as main sources of sexual education is associated with significant KAP levels.

• *Do not consume alcohol frequently*

The quantity of times a week in which a young person consumes alcohol also shows an association with variations in KAP scale, regardless of his/her educational level, age, ethnicity, income and sexual orientation. The higher the frequency of alcohol intake, fewer points in KAP scale. The relationship is linear and inversely proportional, as demonstrated in the *Graph 3*.

• *Having leisure and being engaged*

Young people with option for recreation and fun are also those who have higher KAP levels, especially in public areas, such as parks.

A similar pattern is observed when comparing young people who participate in any social movement or program, because young people who indicate having social participation also have higher KAP levels.

• *Access the Internet, with reservations*

In general, the habit of accessing the Internet is also associated to higher levels of knowledge, attitudes and practices in STD/AIDS and viral hepatitis. However, that association depends on the kind of Website being accessed. In the case of research Websites and blogs, the association is significantly positive; however, for those who

have the habit of accessing sex Websites, the association is significantly negative (*Graph 2*).

• *Interest in learning*

Young people interested in learning new things demonstrate higher KAP levels. It occurs regardless of ethnicity, educational level, age, gender, income and sexual orientation (*Graph 3*).

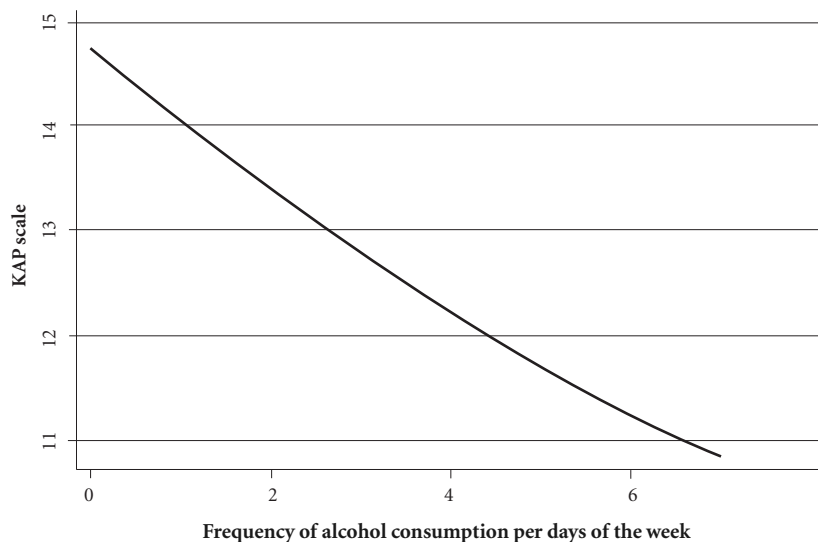
• *Having a parent or teacher as a reference*

Finally, when the young person has the parent or teacher as main references to talk about his/her personal problems, higher KAP levels in STD/AIDS and Viral Hepatitis were also observed (*Graph 4*).

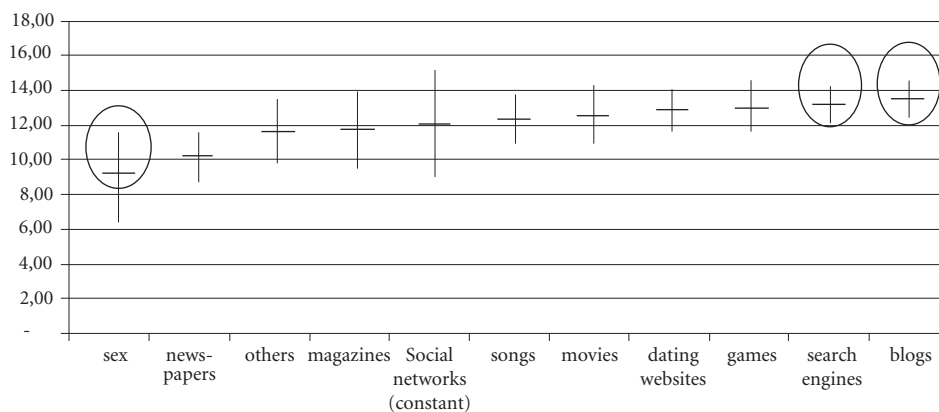
## Discussion

Based on a review of national and international literature, it is found that there is a consistency in the results found in this study. That both for sociodemographic factors and social determinants associated with the variation in the level of knowledge, attitudes and practices (KAP) in STD/AIDS and Viral Hepatitis).

With regard to sociodemographic factors, indigenous young people are in a situation of greater vulnerability. According to Garnelo and Pontes<sup>8</sup>, the situation of indigenous peoples has been considered as high vulnerability to STD/AIDS due to their peculiar insertion in interethnic relations and marginalization in the access to health care at all levels.



Graph 1. KAP scale by frequency of alcohol consumption per week.



Graph 2. Impact of reduced vulnerability due to Internet access.

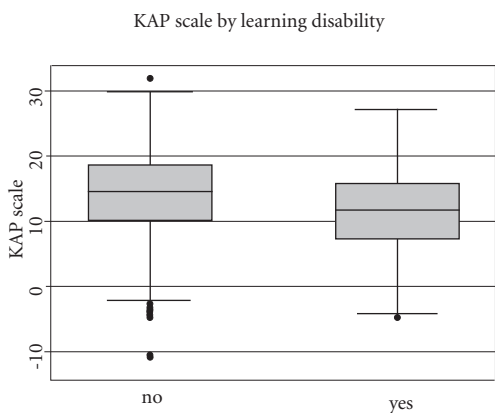
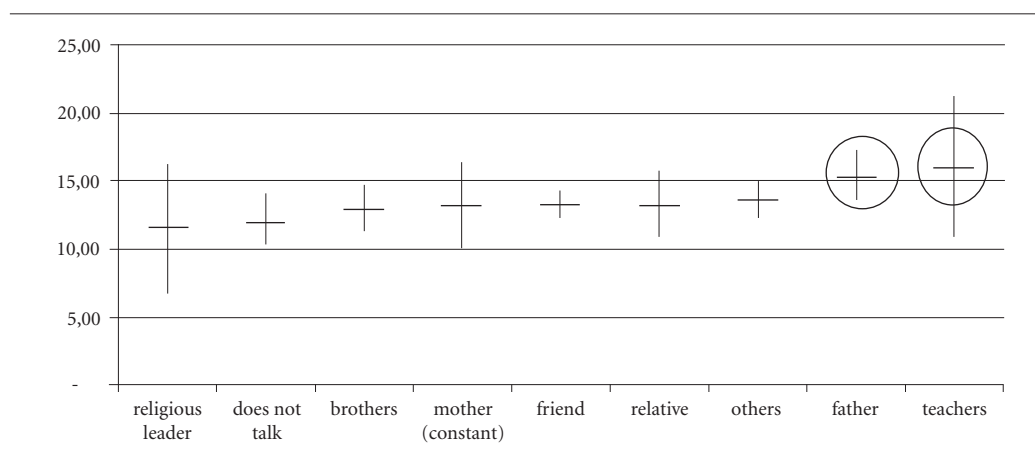


Gráfico 3. KAP Scale by learning disability.

Gender and education are also sociodemographic factors widely mentioned in national and international literature as highly vulnerable variables in relation to HIV/AIDS/Viral Hepatitis. In the last decades, there has been a large increase in the transmission of HIV and other STD among young women in Brazil<sup>9</sup>. However, it is noteworthy to emphasize that the larger proportion of cases is related to populations of young men. In the case of education, an epidemiological bulletin on HIV/AIDS issued by the Brazilian Department of Health confirms the constant concentration of cases in less educated and poorest populations<sup>10</sup>.





**Graph 4.** Having father or teacher as the main reference and KAP Scale variation.

Young married couples also presented lower KAP levels lower in relation to single ones. Some studies attest to that trend in Brazil. Based on a survey carried out by Maia et al.<sup>11</sup> in the Federal District with married men and women between 18 and 49 years old, the authors conclude that “their marital perceptions reflected their acculturation about gender roles and hierarchy of sexual-effective relationship, which may collaborate so that preventative behaviors are little adopted”.

As demonstrated in the results of this study, having parents and health professionals as the main source of sex education and have the teacher as main reference person significantly contribute to higher KAP levels. It does not depend of ethnicity, gender, age, income or education.

That result reinforces several studies already carried out on the importance of the parents in their children’s sex education. Although friends are mentioned as the main sources of sex education and that parents are often in the background, the importance of dialoging parents cannot be minimized. Quite the opposite, the study demonstrates that the association among higher levels of sexual education and involvement of parents is significant. Pereira et al.<sup>12</sup> indicates that: “some particulars (are) identified of sexuality of teenagers living in poor environment, emphasizing the existence of less information, less communication with parents and more tendency to risk behavior”.

Other adult references are essential, and sex education should go through a frank and open discussion between young people and adults (es-

pecially teachers and health professionals). To this end, schools should address matters regarding sexual education more frequently. For that, it necessary to enable every faculty and healthcare professionals in order to become a reference on the matter to their students and patients. Just like the issue of environmental sustainability has become a cross-cutting issue in schools, sexual and reproductive rights may also and should be discussed and used as examples in all school subjects.

Logically, the deficiency of a contemporary sex education in schools is not only a Brazilian problem. Studies conducted by Foster<sup>13</sup>, Klinkert<sup>14</sup>, Mlyakado<sup>15</sup> are clear in this regard. In Portugal, Macario<sup>16</sup> further demonstrates that although the legislation already includes the cross-cutting feature of sex education, according to the author:

“Strategies used should be more participatory, trying to work according to the project work methodology. Teachers should not judge that their students are ‘too young’ a priori, as the degree of maturity and experience is more important than age...”

Other social determinants are directly related to the behavior of young people themselves in the face of their community, their interest in learning, accessing research sites and blogs on the Internet and the frequency of alcohol consumption. It is interesting to note that these are determining factors which are carried out by the young person him/herself, but end up interfering with their KAP levels in STD/AIDS/Viral Hepatitis.

Even taking into account that many of these determinants are also targeted by the environment in which they live, for example, the glamorization of alcohol use by youth groups, it is evident that resilient and socially committed young people are reaching higher KAP levels. Few references are found in literature to demonstrate that association. This is because their hypotheses have as main dependent variable a specific action, such as not having used a condom during the last sexual intercourse. It is known that alcohol interferes directly in the decision of preventive sex, as exposed in Ruzany et al.<sup>17</sup>, Jeolás & Ferrari<sup>18</sup>. However, as demonstrated in this study, its continued use also contributes to lower levels of knowledge, attitude and other preventive practices regarding STD/AIDS and Viral Hepatitis.

In this context, it is suggested to promote other studies to measure more broadly how these individual determinants impact on a set of knowledge, attitudes and preventive practices. That is, one can infer that the self-learning and engagement process is associated with a more sustainable attitude of STD/AIDS and Viral Hepatitis prevention.

Even taking into consideration the robustness of the results found in this study, it is worth noting some limitations of the study which may contribute to compromise the validity and consistency of the results found. With regard to validity, even with the use of pretesting, some questions may not have been understood properly by some young people from specific regions of Brazil. That is because the meaning of some terms may be different in each region in Brazil.

In addition, the KAP scale of STD/AIDS and Viral Hepatitis, although it may be used as a good parameter, does not address all the issues related to sexual practices, attitudes regarding sexual rights, etc. That is, the scale does not appropriate of all the elements that define human sexuality and its vulnerabilities. More specific questions about procedures for the prevention, treatment and education could increase the consistency of the scale. However, it is noteworthy that even with that limitation, the parameters used were applied homogeneously to all respondents.

The vulnerability of young Brazilians is still high. However, the risk perception is significantly lower. The understanding of the vulnerabilities

of young Brazilians and their social determinants is crucial for the strengthening of public programs and policies. Therefore, on the basis of the results of this study, comprehensive policies and programs to promote the access to leisure options, sexual health services and environments of debate and democratic participation, with the involvement of the family, about human sexuality, offer enriching conditions and experiences for the prevention of STD/AIDS and Viral Hepatitis. The cost for the treatment of STD is high, and prevention is always the best option. Programs directing efforts to take into account socio-demographic factors and social determinants that influence the vulnerability of young people are more likely to raise the level of knowledge, attitudes and practices.

## Collaborations

MB Fontes and RC Crivelaro worked in all phases of the study, from its design, research protocol submission to the ethics committee of the School of Medicine of Universidade de Brasília, field collection follow-up, analysis and final editing. AM Scartezini worked in the study design, research protocol submission to the ethics committee of the School of Medicine of Universidade de Brasília and follow-up of the final editing. DD Lima and AA Garcia worked in the research protocol submission to the ethics committee of the School of Medicine of Universidade de Brasília, coordination of data collection and database formation and consolidation. RT Fujioka supported the research protocol submission, the review of databases and charts and tables generated.

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