

Title: Knowledge about HIV / AIDS. An intergenerational perspective.

Summary

Generations of young people, adults and the elderly have or have had different ways of acquiring knowledge about HIV / AIDS. The accessibility of information, the evolution of information technology, or the sexualized connotation, can influence knowledge in the various generations.

Objective: describe the knowledge about HIV / AIDS among college students and family predecessors.

Method: quantitative, descriptive, cross-sectional study. Convenience sample of 147 participants recruited from students and their families. A knowledge scale of eighteen items was applied. Ethical principles cautioned, project with registration nº13009 in the Ethics Committee of the University of Évora.

Results: Through analysis of multiple responses it was observed that the most important source of information is television. Most participants reveal knowledge about HIV / AIDS. Women have more knowledge. There are significant inter-generational differences, exhibiting the youngsters the highest level of knowledge.

Conclusion: university students' knowledge about HIV / AIDS, reflecting their family background and academic development, is the support of interventions in the academic community.

Keywords: Knowledge, generation effect, HIV / AIDS, nursing, nursing students, infection, technology, family

Introduction

Ways of acting on HIV infection have changed over time and increasing knowledge allows some level of prevention. The work and effort has been great, in partnership with several organizations, aims to reach the goals proposed for 2020. The expression 90/90/90, conveys the urgency of achieving 90% of people diagnosed, of these, 90% in treatment and of these, 90% with undetectable viral load (UNAIDS, 2014, WHO, 2019a). HIV / AIDS infection has been known in Portugal since the 1980s (Sabino, Barreto, & Sanabani, 2005). This fact concentrated the largest number of people in Africa, which held more than half of the world's cases (WHO, 2019a).

Between 1961-1975, it was estimated that there were around 1 million Portuguese young people in Portugal who had completed their military service in Angola, Guinea and Mozambique (Pereira, Pedras, Lopes, Pereira, & Machado, 2010). The impact of the Portuguese colonial war on the spread of HIV infection is unclear. Some authors point out that the epidemiological link between HIV-2 and Portugal, initiated during the presence of the colonial army, was recognized with the first cases in Europe in Portuguese veterans (Poulsen, Aaby, Jensen, & Dias, 2000). Although the occurrence of HIV infection was unknown for young people who were in military service and for drug addicts at that time, the risks were high (DGS, 2018) without any incidence or prevalence. Access to knowledge was scarce, stigmatization of high sexuality, prejudice precluded the search for information and indeed, conditions of propagation were facilitated, given the long history of association between war, drugs and sexual experimentation (Bergan-Cico, 2012, Calado, 2016). From the 1980s onwards, and in an attempt to cope with the pandemic, health policies sought to address the problem (DGS, 2018). It is even recognized by the WHO to change health policies in Portugal, aiming to reach strong responses regarding the extinction of the infection until 2030 (WHO, 2019b). Currently, the information sources are very diversified and register preferences according to the age of the users, that is, they vary with the generations and the accessibility (Li et al., 2009). Today new technologies are the great way to communicate. This can be seen, for example, in DGS social networks, supported by new technologies and a rise of 89% in the number of followers (INSA, 2018).

Community intervention projects, NGO programs, and other associations complement health services by extending screening to other contexts, including academic ones. The creation of projects in this area improves accessibility to information, however, in Europe, more specifically in Portugal, HIV infection continues to present a serious public health problem. In 2017, 1068 new cases of HIV infection were identified (INSA, 2018). In 2017, the national epidemiological surveillance database presents a rate of 10.4 new cases per 100,000 inhabitants (INSA, 2018), which is higher than the 2016 data (INSA, 2017), with a new 8.1 100,000 inhabitants, higher than the EU average (6.3) (WHO, 2019a). By living with several generations in the same family, by focusing on individual health models, models of expression of sexuality and communicating values inheritance, it will be of interest to know the level of knowledge about HIV / AIDS within the family age groups. Thus, the objective of the present study is to describe the knowledge about HIV / AIDS transmission among nursing students and their families.

Method

Sample of convenience, consisting of students of the 2nd and 3rd year of nursing and their relatives of previous generation, in the figures of parents or uncles and grandmothers. In a first phase, the students were invited to participate in the study; In a second phase, the students were asked to present the same invitation and questionnaire to their families. Of the 200 questionnaires delivered in unit envelope and returned closed, 147 were completely filled out.

The data collection instrument included a section with sociodemographic variables (i.e., gender, age, occupation, residence in former colony), sources of HIV / AIDS information (i.e., seven dichotomous variables as internet example, friends) and a scale of knowledge about HIV / AIDS (Carey & Schroder, 2002). The scale applied in the current study refers to the reduced version of the HIV Knowledge Questionnaire (HIV-KQ-45) and is called the Brief HIV Knowledge Questionnaire (HIV-KQ-18) (Carey, Morrison-Beedy, & Johnson, 1997; Carey & Schroder, 2002).

It is an instrument composed of 18 manifest variables, presented categorically, with options of "true" response, agreeing with the statement, "false" disagreeing

with the statement and "I do not know", expressing the uncertainty / ignorance of the subject. It is self-filling, taking about 5-7 minutes to respond. The score, obtained through the sum of the correct answers, varies from 0 to 18. The items refer mainly to knowledge about sexual transmission and are for example in item 5 "bathing or washing the genitals after sexual intercourse prevents the person is infected with HIV. " In the original study the value of internal consistency in the samples studied was .75 to .89 (Carey & Schroder, 2002). In the current study, the Kuder-Richardson 20 (KR-20) coefficient was .757

The instrument is public and accessible electronically at <http://www.midss.org/content/hiv-knowledge-questionnaire-hiv-kq-18>. In Portugal the scale in the long version and in the reduced version was applied in the general population and university students (Cruz, 1999; Martins, Canavarro, & Pereira, 2016).

The data were analyzed in version 24 of the IBM SPSS Statistics® application. The significance level was set at $p < 0.05$.

The current study is part of a project to prevent HIV / AIDS in the academic community, and obtained a positive opinion from the Ethics Committee for Health and Welfare of the University of Évora, Portugal, under the registration number 13009.

Results

Sixty male participants (40.8%) and 87 female participants (59.2%), aged 18-83 years ($M = 41.46$; $SD = 18.69$) participated. Of the participants, 67 were students (45.6%) and the rest were distributed by parents or uncles ($n = 52$, 35.4%) and grandparents ($n = 28$; 19%).

Through an analysis of multiple responses, it was observed that in the current sample, the most relevant sources of information are television with 109 references (74.1% of cases), followed by health professionals and magazines with 74 statements (50.3% of the cases), according to table 1.

Table 1 Sources of information on VIH/AIDS

	Responses N	Percent	Percent of Cases
Army	11	2.9%	7.5%
Professionals	74	19.4%	50.3%

Lovers	6	1.6%	4.1%
Friends	44	11.5%	29.9%
Magazine	74	19.4%	50.3%
TV	109	28.5%	74.1%
Internet	64	16.8%	43.5%
Total	382	100.0%	259.9%

Continuing the analysis of multiple answers, it was observed below, in the mentioned sources, which representation of the age groups. It is noticed that in the Internet source, the greater representation is in the students, the Army is referred mainly by the parents / uncles and the boyfriend (s) is only mentioned by the students (figure 1).

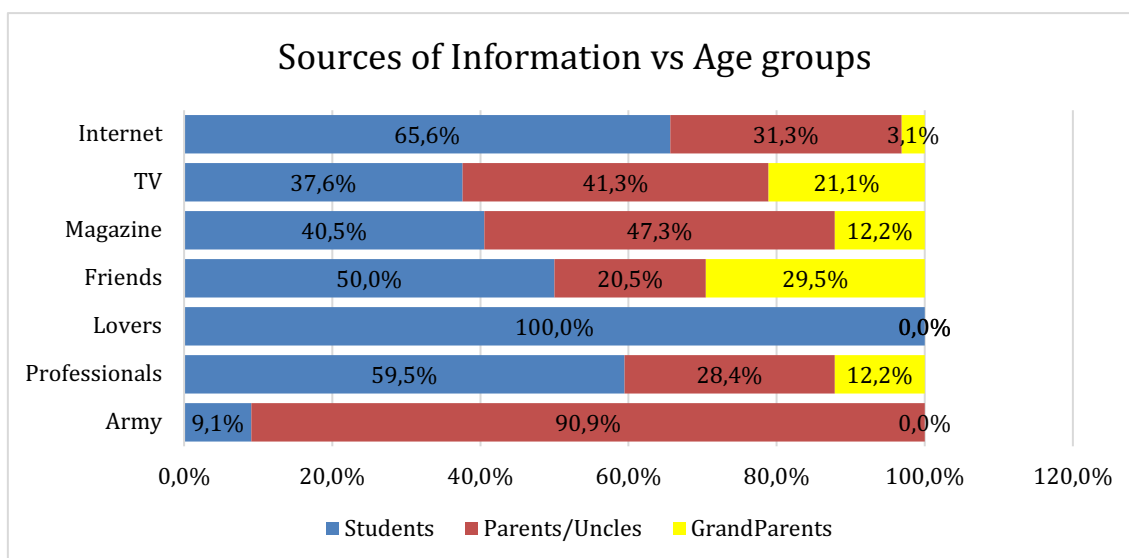


Figure 1 Representation of age groups considering sources of information

Regarding knowledge, the percentage of correct answers varies between 39.5% (item 15) and 91.8% (item 14). In 9 items, there are more than 25% of incorrect answers as per table 2.

Table 2 Frequencies of Correct and Incorrect Responses to HIV-KQ-18

	Correct n(%)	Incorreto r don't know n(%)

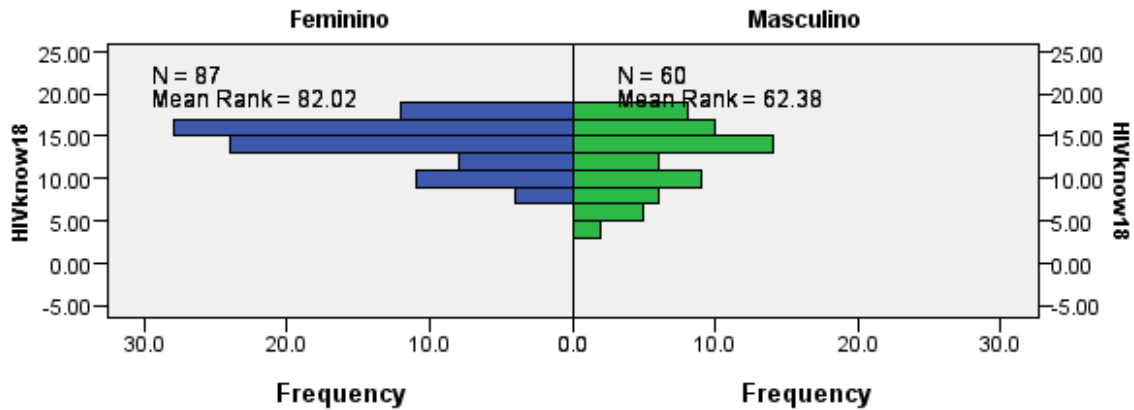
1. Coughing and sneezing DO NOT spread HIV (T) (<i>Tossir e espirrar não transmite VIH (V)</i>)	112 (76.2)	35 (23.8)
2. A person can get HIV by sharing a glass of water with someone who has HIV. (F) <i>Pode-se contrair o VIH por partilha de um copo de água com alguém infetado (F)</i>	108 (73.5)	39 (26.5)
3. Pulling out the penis before a man climaxes/cums keeps a woman from getting HIV during sex (F). <i>Durante as relações sexuais, retirar o pénis antes de ejacular, evita que a mulher fique contagiada com VIH (F)</i>	114 (77.6)	33 (22.4)
4. A woman can get HIV if she has anal sex with a man (T). <i>A mulher pode contrair o VIH se fizer sexo anal (V)</i>	120 (81.6)	27 (18.4)
5. Showering, or washing one's genitals/private parts, after sex keeps a person from getting HIV (F). <i>Tomar banho ou lavar os genitais depois das relações sexuais evita que a pessoa se contagie com VIH (F)</i>	132 (89.8)	15 (10.2)
6. All pregnant women infected with HIV will have babies born with AIDS (F). <i>Todas as grávidas infetadas com VIH terão bebés com SIDA (F)</i>	86 (58.5)	61 (41.5)
7. People who have been infected with HIV quickly show serious signs of being infected (F). <i>Pessoas que foram infetadas com VIH, rapidamente apresentam sinais graves de infeção (F)</i>	100 (68.0)	47 (32.0)
8. There is a vaccine that can stop adults from getting HIV. (F). <i>Existe uma vacina que pode impedir os adultos de contrair VIH (F)</i>	91(61.9)	56 (38.1)
9. People are likely to get HIV by deep kissing, putting their tongue in their partner's mouth, if their partner has HIV (F). <i>Pode contrair-se o VIH no beijo íntimo se ao por a língua na boca do parceiro, ele está infetado com VIH (F)</i>	92 (62.6)	55 (37.4)
10. A woman cannot get HIV if she has sex during her period (F). <i>A mulher não pode contrair VIH se tiver sexo durante o período menstrual (F)</i>	125 (85.0)	22 (15.0)
11. There is a female condom that can help decrease a woman's chance of getting HIV (T). <i>O preservativo feminino diminui a possibilidade da mulher contrair VIH (V)</i>	95 (64.6)	52 (35.4)
12. A natural skin condom works better against HIV than does a latex condom (F). <i>Um preservativo de pele natural funciona melhor contra o VIH do que um preservativo de látex (F)</i>	83 (56.5)	64 (43.5)
13. A person will NOT get HIV if she or he is taking antibiotics (F). <i>As pessoas não contraem VIH se estiverem a tomar antibióticos (F)</i>	127 (86.4)	20 (13.6)
14. Having sex with more than one partner can increase a person's chance of being infected with	135 (91.8)	12 (8.2)

HIV (T). <i>Ter relações sexuais com mais que um parceiro, aumenta a possibilidade de ser infectado com VIH (V)</i>		
15. Taking a test for HIV one week after having sex will tell a person if she or he has HIV (F). <i>Fazer o teste do VIH uma semana após o contato sexual dá informação se a pessoa está infectada ou não (F)</i>	58 (39.5)	89 (60.5)
16. A person can get HIV by sitting in a hot tub or a swimming pool with a person who has HIV (F). <i>Podemos contrair o VIH se nos sentarmos numa banheira ou piscina, com uma pessoa infectada com VIH (F)</i>	119 (81.0)	28 (19.0)
17. A person can get HIV from oral sex (T). <i>Podemos ficar contagiados com o VIH através do sexo oral (V)</i>	94 (63.9)	53 (36.1)
18. Using Vaseline or baby oil with condoms lowers the chance of getting HIV (F). <i>Usar vaselina ou óleo lubrificante no preservativo diminui a possibilidade de contrair VIH (F)</i>	119 (81.0)	28 (19.0)

The knowledge score in HIV-KQ-18 ranged from 4 to 18, with a median of 14 and a mean of 12.99 (SD = 3.35). There was a negative association between age and level of knowledge ($r = -0.44$, $n = 147$, $p = .000$) The Kolmogorov-Smirnov test with the Lilliefors correction revealed a non-normal distribution ($K-S = .154$; $gl = 147$; $p = .000$), which was preferred among non-parametric tests. There was a significant difference between the men's and women's knowledge, with a mean of higher orders ($U = 3,307,500$; $NMa = 60$; $NFem = 87$; $p = .006$) in the Mann-Whitney test (figure 2).

Independent-Samples Mann-Whitney U Test

P2Sex

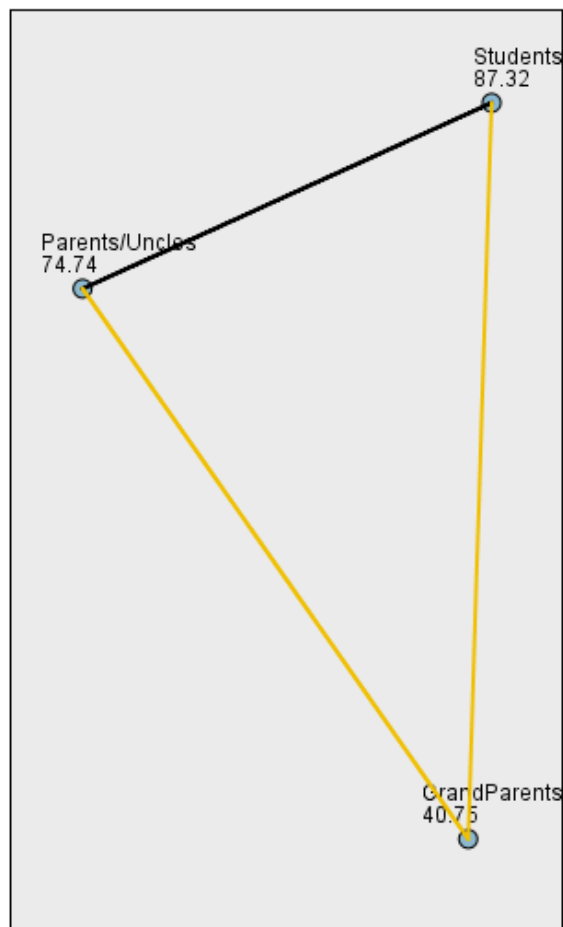


Total N	147
Mann-Whitney U	3,307.500
Wilcoxon W	7,135.500
Test Statistic	3,307.500
Standard Error	252.118
Standardized Test Statistic	2.767
Asymptotic Sig. (2-sided test)	.006

Figure 2 Mann-Whitney test for comparison of medians of HIV-KQ-18 according to sex

A Kruskal-Wallis test for independent samples showed that there were significant differences in the knowledge score assessed by HIV-KQ-18 ($H(2) = 23.951$; $p = .000$; $n = 147$) when considered the three groups of participants (ie, students, parents / uncles and grandparents). In the multiple comparisons of Dunn's orders, it is found that the grandparents exhibit a significantly lower level of knowledge than the students and the group of parents / uncles. On the other hand, the level of knowledge of the students and their parents / uncles, although higher, does not have significant differences (figure 3).

Pairwise Comparisons of AgeGroup



Each node shows the sample average rank of AgeGroup.

Sample1-Sample2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj. Sig.
GrandParents-Parents/Uncles	33.990	9.917	3.427	.001	.002
GrandParents-Students	46.571	9.521	4.892	.000	.000
Parents/Uncles-Students	12.581	7.819	1.609	.108	.323

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same.

Asymptotic significances (2-sided tests) are displayed. The significance level is .05. Significance values have been adjusted by the Bonferroni correction for multiple tests.

Figure 3 Multiple comparisons of Dunn orders for HIV-KQ-18 according to subsamples of age groups

Discussion The reliability of HIV-KQ-18, through the KR-20 test, was verified. The coefficient showed similar values to the original study and Portuguese studies (Carey & Schroder, 2002; Cruz, 1999; Martins et al., 2016). Although HIV-KQ-18 is validated in a national sample, the assessment of internal consistency in each study is a methodological practice to maintain (Bryman & Cramer, 2011; Souza,

Alexandre, & Guirardello, 2017). Having obtained satisfactory values, it can be affirmed that in the current study, HIV-KQ-18 measures the knowledge of the subjects, that is, what they should measure. In the sources of information for acquiring knowledge about HIV / AIDS, the results are competing with other studies, which in the same order indicate the television, newspapers / magazines and only in a later position friends or other interpersonal forms (Li et al., 2009). In the current study, television stands out with the highest number of statements. The ability to communicate content through sound and image and to capture the attention of this audiovisual medium has proved to be exceptional, going through several generations. It should be noted, however, that it is the intermediate generation (i.e., parents / uncles) who refers to it most. Perhaps the older ones, in their youth, would have little access to this medium, which entered Portugal in the 60s and, on the other hand, would also have little reference to TV as a vehicle for information, for health issues with a sexualized character. The fact that young people in today's study use TV less as a means of information and prefer other technologies (i.e., Internet), competes for studies that argue the greater impact of the dialogic communication (i.e., telephone, online networks) versus the monological (i.e., radio, cinema, television) (Rotondi, Stanca, & Tomasuolo, 2017). Note that the Internet source registers the highest representation in young people (i.e., 65.6% in students). In fact, also in Portuguese studies WhatsApp and Facebook are used by young people for communications on intimate subjects, being powerful tools in non-face-to-face interaction (Karapanos, Teixeira, & Gouveia, 2016). Interestingly, the source of information "boyfriends", registers only young people (i.e., 100%). This contributes to the idea that subjects connoted with the expression of sexuality would be difficult to communicate in previous generations. To these results, the stigmatization of sexual subjects in the education of previous generations (i.e., parents / uncles and grandparents groups) will not be surprising. In fact, only the group of the youngest of this study was exposed and lived with sex education in the school curriculum. Perhaps sex education will have opened up more possibilities for information, which also seem to be visible in the greater demand of health professionals and friends compared to the two oldest groups. It seems clear then that the postponement of this aspect of education had effects, perhaps not conscientized by the own ones in the phase of its youth. In fact, in Portugal, although the law was published in 1984 (i.e., Law

no. 3/84 of March 24), only about 25 years later sex education became universal and constant in compulsory education (i.e., of the Republic, Law no. 60/2009 of August 6). The greater representation of health professionals as a source of information for young people may possibly be influenced by prevention programs, exchange of syringes, giving visibility to health agents. It was in the early 2000s that the focus of public health became relevant (WHO, 2019b).

In the sources of information, the troop is not recognized by the younger, but the intermediate generation of parents / uncles refers to it with relevance (i.e., 90.9%). At least part of the male subjects will have integrated the military forces, since the colonial war ended about 45 years ago. The Military Service for some young people at that time was open to the world and the opportunity for experimentation, enhanced by circumstances that facilitated risky behaviors, namely, the consumption of legal and illegal drugs (Calado, 2016). Portuguese studies acknowledge that the colonial war between 1961-1974 and the returnee movement may have contributed to the spread of infection through sexual contacts, blood transfusions due to war wounds, and population miscegenation (Poulsen, Aaby, Jensen, & Dias, 2000). Concluding the discussion of the analysis of multiple responses emphasizes the greater use of communication technologies by young people compared to other age groups. Overall scores on the HIV-KQ-18 score are good, as the mean and median scores are high. The items of HIV-KQ-18 with success beyond 70% are mostly reported to aspects of hygiene / therapy (i.e., item 1, 2, 5, 13, 16, 18) or coital interaction (i.e., item 3, 4, 10, 14). On the other hand, items referring to transmission and treatment myths (i.e., item 6, 7, 8, 9, 11, 12, 17) are in a 50-60% hit. These results contribute to Portuguese studies where it is observed that despite good knowledge, there are still myths about HIV / AIDS (Costa, McIntyre, & Ferreira, 2018). Age inversely associated with knowledge was an expected result, not only for the aspects already discussed, rooted in culture and educational progress, but also because the younger group in the current study are Nursing students. Most of these students are part of the University Project to Know and Prevent HIV / AIDS in the Academic Community, which runs from the academic year 2013-2014 (i.e., www.projetoivhsida.uevora.pt). The project is a pioneer and is developed in partnership with local enlisted men. The greater knowledge of the students competes for the realization of similar projects (i.e., Howard University College of

Medicine, USA) that recognize benefits (Downer & Bailey, 2018). The knowledge that the students obtain individually is corroborated in countries with a high incidence of HIV infection (Oppong Asante & Oti-Boadi, 2013). In the current study, the fact that parents / uncles and grandmothers are invited to participate may increase the interest of family members on the subject. The study, by extending it to the families of the students, introduces the subject by unveiling the HIV / AIDS theme, contributes to the goal of the World Health Organization for Portugal, which will be to reach the UNAIDS goal by 2020 - 90% of people diagnosed in treatment.

Conclusions

The knowledge of the subjects is satisfactory, with differences among genders, favorable to the participating women. The sources of information are notoriously different in the preferences of the groups of subjects of the three generations. The younger ones, by revealing more knowledge, suggest the evolution of information availability, both with the evolution of the school programs and the political conditions of the country, to which the young people of previous generations were subjected. Emphasis is placed on the increased use of communication technologies by young participants. The study, integrated in a broader project, evidences gains that are not counted financially, but important for improving the health of university students. The limitations of the study relate to the selection of the participants, because although the subjects had different origins and the confidentiality was respected, the sample was non-random.

References

- Antunes, F., França, L., Sousa, S., & Valadas, E. (2009). 20 Years of HIV-2 Infection in Portugal: Trends and Changes in Epidemiology. *Clinical Infectious Diseases*, 48(8), 1166-1167. Retrieved from <https://dx.doi.org/10.1086/597504>. doi:10.1086/597504
- Bergan-Cico, D. (2012). *War and drugs*. New York: Routledge.
- Bryman, A., & Cramer, D. (2011). *Quantitative Data Analysis with IBM SPSS 17, 18 & 19: A Guide for Social Scientists*. East Sussex: Routledge.
- Calado, V. (2016). As drogas em combate: usos e significados das substâncias psicoativas na Guerra Colonial Portuguesa. *Etnográfica*, 20(3), 471-494.
- Carey, M., Morrison-Beedy, D., & Johnson, B. (1997). The HIV-Knowledge Questionnaire: Development and evaluation of a reliable, valid, and practical self-

- administered questionnaire. *AIDS and Behavior*, 1(1), 61-74. doi:10.1023/A:1026218005943
- Carey, M. P., & Schroder, K. E. (2002). Development and psychometric evaluation of the brief HIV Knowledge Questionnaire. *AIDS education and prevention : official publication of the International Society for AIDS Education*, 14(2), 172-182. Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/12000234> Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/PMC2423729/>.
- Costa, E., McIntyre, T., & Ferreira, D. (2018). Safe-Sex Knowledge, Self-Assessed HIV Risk, and Sexual Behaviour of Young Portuguese Women. *Portuguese Journal of Public Health*, 36(1), 16-25. Retrieved from <https://www.karger.com/DOI/10.1159/000486466>. doi:10.1159/000486466
- Cruz, J. (1999). Conhecimento, atitudes e práticas sexuais dos estudantes universitários: Implicações para a prevenção do VIH/SIDA nos jovens. In J. Precioso (Ed.), *Educação para a Saúde* (pp. 217-233). Braga: Departamento de Educação da Universidade do Minho.
- DGS. (2018). *Infeção VIH e SIDA. Desafios e estratégias 2018*. Lisboa: Direção Geral de Saude.
- Downer, G., & Bailey, D. (2018). HIV Prevention on HBCU Campuses. *Annals of Infectious Disease and Epidemiology*, 3(1). Retrieved from http://www.remedypublications.com/infectious-disease-and-epidemiology/articles/pdfs_folder/aide-v3-id1029.pdf
- INSA. (2017). *Relatorio Infeção VIH e SIDA - situação em Portugal em 2016 - INSA*. Lisboa: Instituto Ricardo Jorge.
- INSA. (2018). *Infeção VIH e SIDA: a situação em Portugal a 31 de dezembro de 2017*. Lisboa: Instituto Nacional de Saude Doutor Ricardo Jorge.
- Karapanos, E., Teixeira, P., & Gouveia, R. (2016). Need fulfillment and experiences on social media: A case on Facebook and WhatsApp. *Computers in Human Behavior*, 55, 888-897. Retrieved from <http://www.sciencedirect.com/science/article/pii/S0747563215301941>. doi:<https://doi.org/10.1016/j.chb.2015.10.015>
- Li, L., Rotheram-Borus, M., Lu, Y., Wu, Z., Lin, C., & Guan, J. (2009). Mass media and HIV/AIDS in China. *J Health Commun*, 14(5), 424-438. doi:10.1080/10810730903032994
- Martins, A., Canavarro, M., & Pereira, M. (2016). *Conhecimentos sobre VIH/SIDA e fatores associados à percepção de risco de infeção por VIH em Portugal*. Paper presented at the III Congresso da Ordem dos Psicólogos Portugueses, Coimbra. https://www.researchgate.net/publication/309292380_Conhecimentos_sobre_VI_HSIDA_e_fatores_associados_a_percecao_de_risco_de_infecao_por_VIH_em_Portugal/stats
- Oppong Asante, K., & Oti-Boadi, M. (2013). HIV/AIDS knowledge among undergraduate university students: implications for health education programs in Ghana. *African health sciences*, 13(2), 270-277. Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/24235924> Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/PMC3824504/>. doi:10.4314/ahs.v13i2.11
- Pereira, M., Pedras, S., Lopes, C., Pereira, M., & Machado, J. (2010). PTSD, Psicologia e tipo de familia em veteranos de guerra colonial portuguesa. *Revista de Psicologia Militar*, 19, 211-232. Retrieved from

[https://repositorium.sdum.uminho.pt/bitstream/1822/16569/1/PTSD%20e%20V
eteranos.pdf](https://repositorium.sdum.uminho.pt/bitstream/1822/16569/1/PTSD%20e%20Veteranos.pdf).

- Poulsen, A., Aaby, P., Jensen, H., & Dias, F. (2000). Risk Factors for HIV-2 Seropositivity Among Older People in Guinea-Bissau. A Search for the Early History of HIV-2 Infection. *Scandinavian Journal of Infectious Diseases*, 32(2), 169-175. Retrieved from <https://doi.org/10.1080/003655400750045286>. doi:10.1080/003655400750045286
- Rotondi, V., Stanca, L., & Tomasuolo, M. (2017). Connecting alone: Smartphone use, quality of social interactions and well-being. *Journal of Economic Psychology*, 63, 17-26. Retrieved from <http://www.sciencedirect.com/science/article/pii/S0167487017302520>. doi:<https://doi.org/10.1016/j.joep.2017.09.001>
- Sabino, E. C., Barreto, C. C., & Sanabani, S. (2005). AIDS: Etiologia e subtipos do HIV. In R. Veronesi & R. Focaccia (Eds.), *Tratado de Infecçiology* (pp. 111-117). São Paulo: Atheneu.
- Souza, A. C., Alexandre, N. M. C., & Guirardello, E. B. (2017). Psychometric properties in instruments evaluation of reliability and validity. *Epidemiol Serv Saude*, 26(3), 649-659. doi:10.5123/s1679-49742017000300022
- UNAIDS. (2014). 90-90-90 An ambitious treatment target to help end the AIDS epidemic. Retrieved from http://www.unaids.org/sites/default/files/media_asset/90-90-90_en.pdf
- WHO. (2019a). Data and Statistics. HIV/AIDS. Retrieved from <https://www.who.int/hiv/data/en/>
- WHO. (2019b). Portugal on fast track to achieve HIV targets ahead of 2020 deadline. Retrieved from <http://www.euro.who.int/en/countries/portugal/news/news/2018/7/portugal-on-fast-track-to-achieve-hiv-targets-ahead-of-2020-deadline>