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## The use of psychoactive substances and adolescents' school performance

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### Abstract

The use of psychoactive substances is a public health problem. The use of these substances usually starts during adolescence and is associated with school problems, namely poor school performance. Research Questions included which psychoactive substances interfere with school performance (learning environment, planning of studies, methods of studying, reading skills, study motivation, overall school performance) in adolescents. The purpose of the study was to analyse the relationship between the use of psychoactive substances and adolescents' school performance. The Research Methods included a cross-sectional study. Data were collected through a questionnaire which included socio-demographic information, psychoactive substances and a school performance scale (adapted from Fermin, 2005). Non-probability sampling for convenience, with 380 students from 7<sup>th</sup>, 8<sup>th</sup> and 9<sup>th</sup> grade. Data were collected in 2011/2012 among students from a Basic School in the Portuguese Municipality of Viseu. Results: There was a 4.2% of prevalence of drug use: 4.3% in boys and 4.1% in girls. For both genders, the most commonly used drugs were hashish and marijuana (43.8%). Girls ( $p < 0.001$ ), younger students ( $p < 0.001$ ), those whose parents graduated from high-school or who have a higher education ( $p = 0.019$ ) and students who do not use drugs ( $p = 0.000$ ) do better in school. We concluded that drug abuse is associated with adolescents' poorer school performance. It is therefore important to identify risk groups and develop policies to prevent youngsters from using psychoactive substances because of the major impact they have on individual, family and social levels.

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**Keywords:** School performance, adolescence, psychoactive substances, drugs.

### 1. Introduction

According to the World Health Organization (WHO) the word drugs refers to any substance which, when absorbed by a living organism, will alter one or more than one of its functions. These substances



can be licit (medical products, alcoholic beverages, tobacco...), but they can also include other active substances (Cocaine, LSD, Ecstasy, opiates...) (Kramer & Cameron, 1975, p. 13).

Drugs can be seen as simple - organic or inorganic- medicinal substances which can be used on their own or as ingredients or can be considered a forbidden chemical substance which use is illegal and harmful to its user, a substance which will affect the body and change that person's mood, his behaviour, his sensations, his humor, the way that person will see and hear things.

When we think about drugs, we commonly tend to think about heroin, hashish, cocaine or ecstasy. Alcohol and cigarettes are also substances that come up when we talk about drugs. Besides those substances, a lot of others, like caffeine or aspirin, are considered to be drugs, too. We have to accept that each culture and each country have their own drugs and their own way of dealing with them (Ganeri, 2002).

Several authors consider "drugs" to be any natural or synthetic substance that, when it is absorbed by the organism, will alter its functions. Natural drugs- like caffeine, nicotine, opium and cannabis- come from certain plants, animals or from certain minerals (Geier, 2013; Feijão, 2010; Henry, 2010; Ganeri, 2002; Riggs, Black, & Ritt-Olson, 2014).

Adolescence is a phase in which the brain prefrontal cortex, a part of our brain which is responsible for behaviour and emotions self-regulation, is developing itself and in which teenagers start making cognitive decisions. A late cortical prefrontal development and its integration with the brain's limbic areas which are associated with reward, pleasure, the search for new experiences and emotions may contribute to the increase of vulnerability and to substance abuse (Riggs, Black, & Ritt-Olson, 2014).

There are other factors than those related to natural development to be taken into account: namely the socio-demographic factors (gender, age, social status), socio-economic and family factors associated with alcohol and drug abuse: growing up with one of the parents only, a poor perception of paternal and maternal support, friends who do drugs, the absence of a strong religious belief and a lack of interest in sports (Tavares, 2001). In a study dealing with "Adolescence, alcohol and drugs: a revision to promote health" the authors state that mass media influence which stimulates the use of legal drugs like alcohol and cigarettes, as well as the fact that using those drugs is socially accepted and supported by the family complacency seem to validate their use. This phenomenon is usually seen as a representation of a ritual of passage into adulthood (Cavalcante et al., 2008).

The use of illicit drugs is a health problem which can lead to other pathologies, mainly to Sexually Transmitted Diseases, AIDS, hepatitis and tuberculosis; that may be associated with school problems (poor school performance, early school leaving, indiscipline and violent behaviour, poor resistance to peer or group pressure, early drug abuse ( usually alcohol, cigarettes and cannabis), with social aspects (destruction of the social fabric due to drug use, the lack of respect or the inability to follow rules or social values) (Portugal. MS:DGS, 2004). An international study (Dunedin Cohort) showed a positive association between the persistent use of marijuana before 18 and damages caused to these drug users' intelligence, attention and memory when they reach adulthood (Meier, et al., 2012). The reports from that study show that few adolescents believe that the regular use of marijuana can be harmful to people's health so they start using cannabis at an early age and on a daily basis. The participants were members of the Dunedin Study, a long-running cohort study of 1037 people who were followed since

their birth (1972/1973) till they were 38 years old. The use of cannabis among these people was evident throughout the interviews conducted when they were 18, 21, 26, 32 and 38. Tests started when they were 13, before they started using that substance and went until they were 38, after a persistent use of cannabis; Cannabis addiction was widely associated with the users' neuropsychological decline and with those who stated using it then they were just teenagers (Meier, et al. 2012). The results suggest that cannabis has a neurotoxic effect on the teenagers' brains that affects several cognitive functions: memorization, focus, logical thinking and visual processing. They also point out the importance of measures designed to prevent drug use and of policies which main concern should be teenagers (Meier, et al. 2012). The annual report presented by the Drug and Drug addiction Institute performed in Portugal and that was based on a sample formed by 13000 students from public schools aged between 13 and 18 (from 7<sup>th</sup> to 12<sup>th</sup> grade) showed an increase in the use of cannabis among older students (16 to 18), which represents 30%, and a decrease in the use of ecstasy. However, we can see an increase in the use of amphetamines and cocaine in students between 13 and 16 (IDT, 2012). The same report, based on the results obtained for the Portuguese reality, showed that the use of drugs has been growing since the 90s; this situation had decreased for the first time in 2006 and 2007, but in 2010 and 2011 the results showed that the use of drugs in teenagers was higher again. This situation shows how investing in prevention should be important. In all the studies performed in 2010 and 2011 cannabis appears to be teenagers' favourite drug (the prevalence of use of cannabis throughout their lives varies between 2,3% in 13 year old students and 29,7% in 18 year old) showing ratings which are close to the prevalence of use for any other drug (between 4,4% for 13 year old students and 31,2% in 18 year old) (IDT,2012). Then with a much lower prevalence of use, we have cocaine, ecstasy and amphetamines, among younger students, and amphetamines, LSD and ecstasy, among older students. In spite of the increase in the prevalence of drugs use between 2006/2007 and 2010/2011- mainly the use of cannabis, LSD and amphetamines- the prevalence of use of any drug is still lower than the one which was evident in 2001, 2002 and 2003 (IDT, 2012). The results presented by a HBSC study and by the Social Adventure Programme performed in 2010 suggest that 6<sup>th</sup> grade students use drugs less often than 8<sup>th</sup> and 10<sup>th</sup> grade students.

When they talk about the drugs they have tried, youngsters refer most of the time hashish/weed and ,right after, they refer stimulants and LSD; it's the boys who mere frequently confess having tried hashish, stimulants, cocaine and ecstasy. Hashish is the older students' favourite substance. 8<sup>th</sup> grade students are those who most frequently refer having already tried stimulants (Matos et al, 2012). Students whose school performance is gradually decreasing are more likely to start using drugs. Low school performance and a decline in the student's performance must be considered risk factors that can lead to drug habits among teenagers (Henry, Smith, & Caldwell, 2007).

Several studies mention that drug users who started when they were teenagers have less chances of success since that drug use may affect the cognitive performance of young people who are in the half-way through their brain development and are particularly vulnerable to drugs. Knowing about the harmful and positive effects of using cannabis is important because it can determine what decisions will have to be made about its medicinal uses and the legalization of the substance. It's clear that those decisions will have serious consequences to public health. Being often considered the most used illicit

drug in the world, with its toxic effect and therapeutic properties, cannabis seems to have a close relationship with the neuropsychological processes that will influence negatively the way they are evolving: when they take cannabis, it seems that the teenagers' brain, which is still going through a development phase, will interrupt those critical development processes (IDT, 2012). The use of illegal drugs and drug abuse represent a serious problem in our society, because those drugs can be purchased with a prescription (tranquilizers, amphetamines...). There are also some substances that are available everywhere (solvents, glues, sprays...) and forbidden substances (marijuana, LSD, heroin, cocaine...).

Aside from leading to unhealthy habits, drug use is a source of conflicts and risks for teenagers. When these habits are more than one-time-only actions, they are part of a set of other habits that are usually associated with serious alcohol drinking, more and more frequent intoxications, poorer school and family integration, stronger bonds with their friends, more visits to bars and to other more restrictive places. To some teenagers, starting to use legal or illegal drugs is a way to show their personal affirmation.

Godley (2006) supports the idea that regardless of the relationship that exists between school performance and drug use, schools are an important environment where we can reach teenagers who are at risk, so we have to give prevention the importance it deserves as a tool that can improve school attendance and the way students will get involved. Having understood what are the factors that can interfere with the students' best school performance, during their teenage period, we have decided, in this study, to analyse the relationship between the use of psychoactive substances and the school performance those students have achieved.

## **2. Research Methods**

We carried out a quantitative, cross-sectional and analytic study. Data were collected through a questionnaire answered by students while in a classroom. Data collection was done in 2011/2012 in a Portuguese basic school in the municipality of Viseu. The collection instrument was formed by socio-demographic variables, questions about the use of psychoactive substances and a School Performance Scale validated by Fermin. This scale, developed by Fermin and adapted to the Portuguese population by Duarte (2008) is formed by 40 items organized in a Likert-type scale: one (1) to five (5)- (1) standing for never, (2) for almost never, (3) for sometimes, (4) for almost always and (5) for always. The items are divided into five subscales, each one of them formed by eight items: Learning Environment (topics 1 to 8); Planning of studies (9 to 16);\_Methods of studying (17 to 24); Reading Skills (25 to 32) and Study motivation (33 to 40). In each subscale the minimum and maximum rates vary from 8 to 40. The global sum gave us the school performance rate which stands between a 40 minimum value and a 200 maximum value. The higher the rates in each factor and in the global scale are, the better will school performance be.

The final sample was formed by 380 students (193 girls) who were between 11 and 17 years old. They were 7<sup>th</sup> grade (36,3%), 8<sup>th</sup> grade (31,1%) and 9<sup>th</sup> grade (32,6%) students.

We asked for permission to submit the questionnaires to the General Board for Innovation and Curriculum Development (DGIDC) and to the Director of the schools where data would be collected.

Once we got the Director's and the parents' permission, we talked with the Coordinator of the Health Education Programme and some other middle executive and management entities. We explained the context of the process, the objectives of the study, the scientific reasons that had led to the investigation and the practical implications of this investigation. The statistic treatment was done through the SPSS (Statistical Package for the Social Sciences) programme (version 21.0 for Windows)

We calculated the central tendencies measures- mean and median- and the measures of dispersion, the range of variation, the coefficient of variation and the standard deviation. In order to compare the rates from two groups, we used Student Test T and the U-Mann Whitney Test (UMW).

### 3. Results

When we asked our young participants whether they had ever used drugs, almost all of them (95,8%) answered negatively. 95, 7% of them were boys and 95,9 were girls. There was a 4,2 % prevalence of drug use (4,3% boys and 4,1% girls).

According to the results from table 1, the drugs which were most commonly used by teenagers from both genders were hashish and marijuana (43%). 18,8% of the participants in our study told us they had already tried drugs once or twice and 25,0% stated they had tried three times or more. The drugs less used by the students interviewed were glue, solvents and LSD (81,2% of the students told us they had never tried any of those drugs). 68,8% of the students said they had never used cocaine, heroin, morphine or opium before. However, 18,8% of the participants confess having used those kinds of drugs once or twice before and 12,5% of them confess having used some of those drugs three times or more.

31,2% state that they have used other types of drugs but they don't say what specific drugs they were referring to.

If we separate the data according to gender, girls are those who have tried more often all the drugs listed (except glues and solvents); when it comes to state the frequency with which they had already tried drugs, boys confessed they used them more frequently than girls (they show a higher percentage in the option "three or more times").

**Table 1.** Drugs use according to gender.

Use	Frequency	Gender		Female		Male		Total	
		n	%	n	%	n	%		
Hashish, marijuana	Never	3	37,5	6	75,0	9	56,2		
	Once-twice	3	37,5	-	0,0	3	18,8		
	≥ 3 times	2	25,0	2	25,0	4	25,0		
Glues or solvents	Never	7	87,5	6	75,0	13	81,2		
	Once-twice	1	12,5	1	12,5	2	12,5		
	≥ 3 times	-	0,0	1	12,5	1	6,2		
Cocaine	Never	4	50,0	7	87,5	11	68,8		
	Once-twice	1	12,5	1	12,5	2	12,5		
	≥ 3 times	3	37,5	-	0,0	3	18,8		
Heroin, morphine, opium	Never	5	62,5	6	75,0	11	68,8		
	Once-twice	1	12,5	2	25,0	3	18,8		
	≥ 3 times	2	25,0	-	0,0	2	12,5		
LSD	Never	6	75	7	87,5	13	81,2		
	Once-twice	2	25	1	12,5	3	18,8		
Ecstasy	Never	5	62,5	6	75,0	11	68,8		
	Once-twice	1	12,5	2	25,0	3	18,8		

	≥ 3 times	2	25,0	-	0,0	2	12,5
	Never	5	62,5	6	75,0	11	68,8
	Once-twice	3	33,3	1	12,5	4	25,0
Others	≥ 3 times	-	0,0	1	12,5	1	6,2
	Total	8	100,0	8	100,0	16	100,0

Regarding drug use in the last 30 days, the results we got are in agreement with those presented in Table1: hashish and marijuana (50%) and other non-specified drugs (6,2%) were the most commonly used substances. Girls' answers show that they used drugs more frequently (72,5%).

In Table 2, it can be seen that teenagers who are not into drugs show, with statistical significance, a better global school performance in all its dimensions.

In general, girls ( $p < 0,001$ ), younger students ( $p < 0,001$ ), those whose parents (or at least one of them) graduated from high-school or from college ( $p = 0,019$ ) and students who don't do drugs ( $p = 0,000$ ) show a higher school performance.

**Table 2.** Drug use and school performance.

#### 4. Discussion

Use habits	No	Yes	UMW	p
School performance	Average order	Average order		
Learning Environment	194,26	89,95	1519,000	0,000
Planning of studies	192,59	121,32	2115,000	0,005
Methods of studying	194,01	94,68	1609,000	0,000
Reading Skills	193,36	106,82	1839,500	0,001
Study Motivation	193,47	104,74	1800,000	0,001
Global School Performance	193,81	98,46	1800,000	0,000

Illicit drugs, namely ecstasy, cannabis, LSD, heroin, speeds, cocaine and crack can lead to addiction. The majority of those substances can cause death and all drugs have serious side effects (Naik, 2001).

A teenager doesn't start using illegal drugs overnight. He usually starts with substances which are tolerated by society, like cigarettes and alcohol, but those experimentation conducts that can turn into dangerous unhealthy habits (Fonseca, 2005). There are many reasons that can make someone turn to drugs, but there's one which is often overlooked: pleasure. The desire to have fun and to try new things, peer pressure, curiosity, easy access, to feel older and more experienced, rage, to feel more confident, to be able to deal with the pressure that is associated with exams, to be able to deal with abuse or to try to improve the way they look are some other reasons (Naik, 2001). In this study, when we asked students if they had ever used drugs, almost all of them (95,8%) gave a negative answer, whether they were male or female. Those results are in agreement with the studies performed by Duarte (2008): the majority of the students (80,7%) answered that they had never used drugs. Both studies are in agreement even for the students who confessed having already used drugs (4,2%): about a quarter of those students who confessed having used drugs in high-school (19,3%) are boys. Girls represent 15,7% of those students. When it comes to the type of drug and the frequency which it is

used, the substances which were most commonly used were hashish and marijuana (43,8%). 18,8% of the students confessed they had tried once or twice and 25,0% tried three or more times. A higher percentage (31,2%) confessed having tried other substances, although they don't specify what was the substance. The drugs that were less used were glues, solvents and LSD. 81,2% of the students said they had never used any of those substances. 68,8% of the students told they had never used cocaine, heroin, morphine or opiates. However, the frequency students used those drugs is similar to those seen before: 18,8% of the students confessed they had used some of those drugs once or twice, while 12,5% said they had used them three or more times. The study performed by Duarte (2008) is in agreement with ours as far as high school students are concerned: from the answers collected, there is no doubt that the most used substances, by boys and girls alike, are hashish and marijuana (75,2%). 32,7% of those students had already tried those substances once or twice and 42,5% three times or more. A high percentage of those students (30,4%) referred they had already used other drugs, but they didn't specify. Our results are in agreement with those found in the study performed by Matos et al. (2012): when students talk about the drugs they tried, they frequently refer hashish and weed, substances that are followed by stimulants and LSD.

In this study, girls were those who have tried all the drugs (but glue and solvents) and more frequently, too. Boys were those who used more frequently LSD, ecstasy and other drugs. When we talked about the drugs they had taken in the last 30 days, hashish/marijuana (50%) and other non-specified drugs (6,2%) were the substances students referred the most. Girls tried those drugs more frequently. The study performed by Matos et al. (2012) shares a different kind of information: in that study boys use drugs more often than girls and they confessed they have frequently used hashish, stimulants, LSD, cocaine and ecstasy.

However, we must stress out that drug use is a predictor variable of school performance in all its dimensions (learning environment, planning of studies, method of studying, reading skills, study motivation and global school performance). Therefore, we can conclude that a better school performance is associated with healthier options that will help avoid inadequate habits. This makes us think that drug use has negative consequences in students' school performance. These results are backed by the studies performed by Duarte (2008): knowing that drug use is a predictor variable of school performance as far as learning environment, planning of studies, method of studying, reading skills, study motivation are concerned, he could reach the conclusion that teenagers' success in all those dimensions depends directly on a better behaviour as far as drug use is concerned. The results presented by the Behavior Survey National Youth Risk (YRBS, 2009) and Henry (2010) show a negative association between drugs and school performance. This means that students who have higher marks are less prone to try drugs, although these associations don't prove the causality. Students with better marks are significantly less prone to get involved in such behaviours as: drug use, taking medical drugs without the doctor's prescription [drugs like OxyContin, Percocet, Vicodin, Adderall, Ritalin, ou Xanax for instance], using ecstasy on a regular basis. U.S. (CDC, 2009).

Studies performed by King, Meehan, Trim, and Chassin (2006), backed by other authors' words, have showed that the use of psychoactive substances during adolescence can lead to memory and focus troubles due to changes in the teenager's brain activity and, as a consequence, to a decrease in his

school performance and in the way he is involved in his school life and can finally increase the risk of school problems and of leaving school before graduation. These studies suggest that drug use in teenage years is related to lower participation in school activities. Illegal drug use and drug abuse is a serious problem in our society, so we have to stress out how important schools are as they have an enormous potential to play a leading role in teenagers' behavioural development and in warning them about the consequences of psychoactive substances.

## 5. Conclusions

We concluded that drug use is associated with lower school performance in adolescents and that teenagers who don't do drugs are those who show a better school performance. Girls are the students who more frequently try drugs, but boys are those who more frequently use those drugs.

We know that it is during our teenage years that the personality features are defined, features that will characterize every person. Thus, it is important for us to identify groups of teenagers at risk: because of their personal characteristics (low self-esteem, low assertiveness, problems which affect their personal relationship...), because of their socio-economic factors and specific family context, since all these factors are associated with drug use in teenagers.

People's and the communities' health is a global concern, so it is fundamental we do everything to reduce the risk contexts that can lead to drug use. We think it is important to adopt a holistic educational action mainly at schools and give risk groups the attention they deserve in order to prevent the use of drugs due to their impact at an individual, family and social level.

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## References

- Cavalcante, M. B., Alves, M. D., & Barroso, M. G. (2008). Adolescência, Álcool e Drogas: uma revisão na perspectiva da Promoção da Saúde. *Esc Anna Nery Revista de Enfermagem*, 12(3), 555-559.
- CDC. (2009). Alcohol and Other Drug Use and Academic Achievement (Vol. What is the relationship between alcohol and other drug use and academic achievement, pp. 1-2). USA: U.S. Department of Health and Human Services. Centers for Disease Control and Prevention. Division of Adolescent and School Health.
- Cox, R. G., Zhang, L., Johnson, W. D., & Bender, D. R. (2007). Academic performance and substance use: findings from a state survey of public high school students. *J Sch Health*, 77(3), 109-115. doi: 10.1111/j.1746-1561.2007.00179.x
- Duarte, J. (2008). Privação do sono, rendimento escolar e equilíbrio psicoafectivo na adolescência. (Doutor em Saúde Mental), Universidade do Porto, Porto.
- Feijão, F. (2011). The 2011 ESPAD Report (Europa). [http://www.espad.org/Uploads/ESPAD\\_reports/2011/The\\_2011\\_ESPAD\\_Report\\_SUMMARY.pdf](http://www.espad.org/Uploads/ESPAD_reports/2011/The_2011_ESPAD_Report_SUMMARY.pdf)
- Fonseca, H. (2005). Compreender os adolescentes- Um desafio para pais e educadores (E. Presença Ed. 4 ed.). Lisboa.



- Ganeri, A. (2002). *Drogas Do Êxtase à Agonia* (Europa-América Ed.)
- Geier, C. F. (2013). Adolescent cognitive control and reward processing: implications for risk taking and substance use. *Horm Behav*, 64(2), 333-342. doi: 10.1016/j.yhbeh.2013.02.008
- Godley, S. H. (2006). Substance use, academic performance and the village school. *Addiction*; 101:1685-7.
- Henry, K. L. (2010). Academic achievement and adolescent drug use: an examination of reciprocal effects and correlated growth trajectories. *J Sch Health*, 80(1), 38-43. doi: 10.1111/j.1746-1561.2009.00455.x
- Henry, K. L., Smith, E. A., & Caldwell, L. L. (2007). Deterioration of academic achievement and marijuana use onset among rural adolescents. *Health Educ Res*, 22(3), 372-384. doi: 10.1093/her/cyl083
- IDT. (2012). Relatório anual 2011. A situação do país em matéria de drogas e toxicodependências (IDT Ed.). Lisboa: Instituto da Droga e da Toxicodependência.  
[http://www.sicad.pt/BK/Publicacoes/Lists/SICAD\\_PUBLICACOES/Attachments/59/Relatorio\\_Anuar\\_2012.pdf](http://www.sicad.pt/BK/Publicacoes/Lists/SICAD_PUBLICACOES/Attachments/59/Relatorio_Anuar_2012.pdf)
- King, K. M., Meehan, B. T., Trim, R. S., & Chassin, L. (2006). Substance Use and Academic Outcomes: Synthesizing Findings and Future Directions. *Addiction* (Abingdon, England), 101(12), 1688-1689. doi: 10.1111/j.1360-0443.2006.01695.x
- Kramer, J.F. & Cameron, D.C. (1975). *Manual sobre dependencia de las drogas*. Geneva: OMS.  
[https://extranet.who.int/iris/restricted/bitstream/10665/40467/1/9243540483\\_es.pdf](https://extranet.who.int/iris/restricted/bitstream/10665/40467/1/9243540483_es.pdf)
- Matos, M. G., Simões, C., Tomé, G., Camacho, I., Ferreira, M., Ramiro, L., . . . Social, E. A. (2012). *A saúde dos Adolescentes Portugueses* (C. d. M. e. O. D. T./IHMT/UNL Ed. Equipa do projeto Aventura Social e Saúde em 2010 ed.). Lisboa: FMH/ Universidade Técnica de Lisboa.
- Meier, M., Caspi, A., Ambler, A., Harrington, H., Houts, R., Keefe, R., . . . Moffitt, T. (2012). Persistent cannabis users show neuropsychological decline from childhood to midlife. *Proceedings of the National Academy of Sciences of the United States of America*, 109(40), 2657-2664
- Naik, A. (2001). *Drogas. Do tabaco e do álcool à heroína, tudo o que tu e os teus professores e toda a gente deve saber*. Trad. Joana Marçal Grilo. Gradiva Júnior. Coleção Geração Fixe nº7. Código de obra 19507. ISBN 972-662-771-0. (Gradiva Ed. 1 ed.). Lisboa.
- Portugal. MS. DGS. (2004). *Plano Nacional de Saúde 2004/2010 Volume 2- Orientações Estratégicas* (DGS ed.). Lisboa:  
Direção Geral de Saúde.
- Riggs, N. R., & Greenberg, M. T. (2009). Neurocognition as a moderator and mediator in adolescent substance misuse prevention. *Am J Drug Alcohol Abuse*, 35(4), 209-213. doi: 10.1080/00952990903005940
- Riggs, N. R., Black, D. S., & Ritt-Olson, A. (2014). Applying neurodevelopmental theory to school-based drug misuse prevention during adolescence. *New Dir Youth Dev*, 2014(141), 33-43, 39-10. doi: 10.1002/yd.20084
- Rodrigues, M. A., Pereira, A., & Barroso, T. (2005). *Educação para a Saúde: Formação Pedagógica dos Educadores de Saúde*. Coimbra: Formasau.
- Tavares, B. F., Béria, J. U., & Lima, M. S. (2001). Drug use prevalence and school performance among teenagers. *Revista de Saúde Pública*, 35(2), 150-158.