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Risky Behaviours: Alcohol, Smoking, Drug Use and Sexuality among High School Students in the Urban District of Antananarivo

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Authors' contributions

This work was carried out in collaboration between all authors. Author RFM designed the study, wrote the protocol and supervised the work. Author RMC carried out the survey and wrote the first draft of the manuscript. Author VEEB performed the statistical analysis and managed the analysis of the study. Authors VEEB and AVB managed the literature searches and edited the manuscript. Authors RBH and RRJ provided critical advice to ensure scientific rigor of the whole study. All authors read and approved the final manuscript.

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ABSTRACT

Aims: (i) Describe the attitudes and practices of students in terms of alcoholism, smoking, drug use and sexuality, (ii) identify the factors that influence the practice of single and multiple risky behaviours, (iii) provide recommendations to control risky behaviours among students based on the results.
Study Design: We conducted a cross-sectional, school-based survey.
Place and Duration: The study was carried out in the high schools of the Urban District of Antananarivo, Madagascar. Data collection lasted 2 weeks (January 27, 2014 to February 7, 2014), using questionnaires filled out by each student individually.
Methodology: We included 231 high school students in Seconde, Première and Terminale levels, male and female, in general education and aged 12 to 24 (68.6% from private institutions and 31.4% from public ones). Data was analysed using comparison techniques and each hypothesis was tested using a .05 level of significance.
Results: The prevalence of risky behaviours among high school students differs according to the nature of the risk. Use of alcohol prevalence is 80%; 95% CI [73.9 - 84.7]. Two in five high school students have smoked cigarettes (40%; 95% CI [36.0 - 49.1]). About sexual activity and drug use, prevalences are respectively estimated at 22%; 95% CI [16.9 -20.0] and 13%; 95% CI [8.6 -17.5]. As for the practice of multiple risks, prevalence is 50%; 95% CI [44.0 - 57.3]. Male gender ($P < .001$), living with separated parents ($P = .02$), obtaining some pocket money ($P < .04$), having a job ($P = .05$), high level of education ($P < .02$), and studying in religious schools ($P < .04$) enhance the practice of multiple risks.
Conclusion: Influenced by their peers, while having the possibility to afford alcohol, drugs or cigarettes, urban high schools students in Antananarivo engage in risky practices early. Thus, a multidisciplinary strategy should be taken into account.

Keywords: Alcohol; smoking; sexual behavior; drug; high school; determinants.

1. INTRODUCTION

In 2005, the Indian Ocean Region, comprising the islands of Comoros, Madagascar, Mauritius, Reunion and Seychelles was home to 4.8 million adolescents between the ages of 10 and 19 (of which 90% live in Madagascar), representing 22.5% of the total population. According to United Nations projections, their number will rise to 7.2 million in 2025. Such rapid growth of the juvenile population, which is typical in 'developing' countries, presents a real governance challenge. The significant increase of the number of adolescents in the next decades can have a positive impact on the region if the public authorities implement policies and programs aimed at facilitating their professional and social insertion [1]. But adolescence is a period prone to various risks and experiments leading to negative consequences in a near or distant future. Indeed, 33% of morbid sequelae in adulthood and 66% of premature adult deaths are linked to behaviours and living conditions that have begun in adolescence, such as smoking, alcoholism, risky sexual behaviour, and drug use [2]. Thus, risky behaviours in adolescence represent a public health problem in many countries, particularly in low income countries [3].

Co-occurring health risk behaviour is associated with poorer educational outcomes, fewer job prospects and criminal convictions [4]. In the previous research, the focus was almost exclusively on single risk factors while adolescents are displaying a concurrent multiple health risk behaviour. Studies conducted in high-income countries illustrate the extent to which risk behaviours tend to co-occur [5-7], which is poorly understood especially in low-income countries. On the one hand, recent studies demonstrated there are sex, age and ethnic differences in the concurrent health risk behaviours in some low-income countries [8]. The co-occurrence of smoking to alcohol use, illicit drug use and having had a sexual intercourse was also mentioned in Bolivia [9]. On the other hand, the potential of interventions targeting multiple risks is particularly intriguing considering the general lack of evidence for the effectiveness of most single-risk policy responses [10]. Studies which specifically focused on youth in Madagascar demonstrate the need for further investigation to develop

those policies. According to the Report of the Indian Ocean Area Observation of Child Rights (ODEROI) in 2008, to address health and social risks related to early sexual initiation and teenage pregnancies, decision-makers could pay special attention to the situation of adolescents, considering more severe social and family pressures to which they are often confronted. It also advises to conduct national studies to better assess factors that can predispose adolescents to tobacco and drug addiction and alcohol abuse [1]. The Global Youth Tobacco Survey (GYTS) [11] demonstrated that there was already a high prevalence of smoking students before reaching high school level, with a very early start, mainly due to family influence and exposition to tobacco smoke. The Survey of Risk Factors of Non Communicable Diseases in Madagascar [12] aimed at developing a National Policy on integrated prevention of risk factors for non-communicable diseases. It demonstrated high smoking, especially the use of chewing tobacco and an excessive alcohol consumption in the capital Antananarivo. In total, while adolescents prove to be a future workforce for the country, the need for evidence-based recommendations proves to be crucial for youth to address the problem of risky behaviours. But why students engage in single and multirisk behaviours is still not well elicited in Antananarivo.

Schooling is compulsory for public education and about one third of the students are concentrated in the capital of Madagascar. In addition, school facilitates adolescents' information sharing and socialization. This environment shapes their behaviour, especially by imitating peers [13,14]. The problematic concerns the effectiveness of the prevention of the practice of risky behaviours among our high school students if policies were focused on school environment and peer pressure only. Predictors of health risk behaviours include the personality but also the biological factors, the family situation, and peer influence [15-17]. Males are more prone to various and multiple risks, as several studies confirm [18-24]. Thus, we formulated the hypotheses according to which the students' risky behaviours are linked to family and socio-demographic context. This study aims to: (i) describe the attitudes and practices of students in terms of alcoholism, smoking, drug use and sexuality, (ii) identify the factors that influence the practice of single and multiple risky behaviours, (iii) provide recommendations to control risky behaviours among students based on the results of the study.

2. METHODOLOGY

2.1 Study Setting

This study was conducted in the urban district of the capital of Madagascar. In Madagascar, high school classes are made up of the youngest « Seconde », then the « Première » and finally the « Terminale » classes which will pass the baccalaureate. One-third of high school students of the island are concentrated in the capital. During schoolyear 2012-2013, there were 38,395 students in general education in the district, of which 68.8% belong to private institutions. The capital has 166 high schools, of which 95% are private institutions. A private school in five is a denominational institution, however denominational institutions account for about 40% of students in private schools. High school students spend 5 or 6 days out of 7 at school with a course volume of up to 40 hours per week (unpublished data of the Urban Educational District of Antananarivo). The curriculum includes a course on adolescent reproductive health for Terminale classes.

2.2 Study Period and Data Collection

A cross-sectional survey was conducted in public, private and denominational high schools of the urban district of Antananarivo, Madagascar during school year 2013-2014. Data collection was carried out from 27 January 2014 to 7 February 2014 (two weeks), by means of a self-administered questionnaire (same for male and female). This questionnaire was pre-tested with a few high school students and revised accordingly. Then, during data collection, students were randomly selected and were grouped by level (Seconde – Première – Terminale) in a room where they filled out questionnaires individually, with the assistance of two facilitators to explain the questions not well understood.

2.3 Population

The study focuses on the students of the urban district of Antananarivo. High school students in Seconde, Première and Terminale classes, male and female, from private and public schools in general education and aged 12 to 24 were included. Students who refused to complete the questionnaire, those exhibiting a physical disability (hard of hearing and speech impaired) and those legally married (having a family booklet) were excluded.

2.4 Sampling Mode and Sample Size

The random sampling technique with two-stage cluster was adopted, with random selection of high schools based on their sizes followed by a random selection of classes in each school. A total of nine institutions were selected, including 3 public institutions, 5 private institutions and one denominational institution. This study focuses on a multiple indicator survey. The following formula was used in the calculation of the sample size: $Z\alpha^2 p(1-p) / i^2$, with:

- $Z\alpha^2$: confidence level of 95% with a risk of 0.05%
- p: estimated proportion of STI by UNAIDS among adolescents in Africa equals 0.1% [25]. We retained this number to calculate the sample size because it is the smallest portion compared to that of tobacco, alcohol and drugs (respectively: 20% [26], 50% [27], 3.5 to 5.7% [28])
- i: desired precision of 0.04%

The resulting sample includes 216 students. With a weight of 5% for non-response and possibility of invalid response, the size of the final sample is 231, including 68.6% private institutions and 31.4% public ones.

2.5 Limits

The intimate nature of certain issues makes evasive and sometimes unreliable answers. The students had the opportunity to answer in Malagasy and French to the open questions. This made it difficult to standardize responses.

2.6 Ethical Considerations

The survey in different schools required documents signed by the Director of the Thesis (which is the base of the present study), referred to the Educational District of Antananarivo. An agreement of the headmasters of the selected schools was also mandatory. Parental consent was requested by some institutions.

The survey is anonymous; the data collected does not identify a student with certainty. Prior to the survey, the appropriateness of the study was explained to the participants. High school students' participation was free, with possibility of withdrawal at any time. All information provided by the students remained strictly confidential. The data were accessible only to persons participating in this research and those responsible for study quality control. In all cases, data have been exploited under conditions ensuring their confidentiality. The publication of the study will not include any individual result.

The authors have obtained all necessary ethical approval from suitable Institutional Committees. This confirms that this study is not against the public interest.

2.7 Data Analysis

Data were analysed with Epi Info 3.5.2. Comparison of proportions called on the use of chi-square test, comparison of means on the use of ANOVA test. The level of significance is .05.

2.8 Operational Definitions

Risky behaviour: drinking alcohol, smoking, use drugs, or having unsafe sex. Multiple risks practice: practice of two or more of the above cited.

3. RESULTS AND DISCUSSION

3.1 Results

In total, 231 students participated in the study (sex ratio: 1), with a mean age of 16±2. The prevalence of risky behaviours among high school students differs according to the nature of the risk. Use of alcohol prevalence rises to 80%; 95% CI [73.9 - 84.7]. Two in five high school students have smoked cigarettes (40%; 95% CI [36.0 - 49.1]). About sexual activity and drug use, prevalences are respectively estimated at 22%; 95% CI [16.9 -20.0] and 13%; 95% CI [8.6 -17.5]. As for the practice of multiple risks, prevalence is 50%; 95% CI [44 -57.3].

3.1.1 Alcohol

The mean age for the first alcoholic drink was 14±2 years. Among the students who have been drinking alcoholic beverages (80%), seven in ten continue to do so. Students, especially girls, prefer to drink beer and wine (60% of boys and 76% of girls who drink). Students usually drink at home (40%) and in bars (28%) and other public places (karaoke: 9%). Having fun is the first reason (45%) as it encompasses finding pleasure and a great atmosphere, then comes curiosity (24%) with the desire to experiment and taste. Being confronted with a problem is only

mentioned in 3% of cases. More than half of consumers do not pay for alcohol. For those who pay, high school students spend an average of 3 057.7±468.4 MGA (Malagasy Ariary, Malagasy currency) monthly.

3.1.2 Smoking

Among those who smoked (40%), only one in five continues. Students get their cigarettes from their friends (53%) and from the seller (42%). Friends influence the student to smoke (65%), then comes curiosity (43%) with the desire to taste and experiment.

3.1.3 Sexual behaviour

The mean age at first intercourse was 16±2 years with precocity in girls. Over the last twelve months preceding the survey, the boys had a mean of 2±1.74 sex partners while girls had 1±0.89. Moreover, 8% of girls and 48% of boys had multiple (two or more) sex partners. Only 23% of girls against 50% of boys who have sex use condoms.

Two-thirds of students have sex because of their love for their partners (67%). While 27% do so to experiment.

3.1.4 Drug use

The mean age of drug taking was 16±2 years with precocity in female (15±1 versus 16±2). Among the students who have already used drugs (13%), three in ten stopped. High school students rather take cannabis (77%). Only one in five (20%) buys his drug, while 72% obtain it them from a friend. Experimenting (33%) is the first cause of drug use, followed by seeking pleasure and inspiration (17% and 13% respectively).

3.1.5 Practice of multiple risks

Relationships between some socio demographic parameters and the practice of single risky behaviours are summarized in Table 1. Males are more likely to practice multiple risks ($P < .001$). Living with separated parents ($P = .02$), receiving some pocket money ($P < .04$), having a paid job ($P = .05$) support multiple risks practice. The higher the education level (Terminale), the more the high school student is prone to multiple risks ($P < .02$). In denominational schools, students have more probability of practicing multiple risks ($P < .04$).

3.1.6 Sources of information

Internet (28%) is the first conveyer of information on sexuality. Health care providers (8%) and parents (5%) are the least called upon. Television is the main source of information on addictive substances (33%) followed by school education (15.8%), internet and parents (14% each).

3.2 DISCUSSION

Precocity in girls on the age of first sexual intercourse and drug use is a matter which should be studied more. It is demonstrated that Madagascar has one of the highest early marriage rate in the world: a girl in two is married or in union before the age of 18 [29], particularly in the south-west of the island. But the high

Table 1. Relationship between some socio demographic parameters and alcoholism, smoking, sexuality and drug use among high school students in the urban district of Antananarivo, Madagascar

	Has ever drunk alcoholic drinks		Has ever smoked		Has ever had sex		Has ever used drugs	
	Yes n (%)	*P*	Yes n (%)	*P*	Yes n (%)	*P*	Yes n (%)	*P*
Gender								
Male	104 (84.6)	0.04	68 (55.3)	< .001	38 (30.9)	< .001	25 (20.3)	< .001
Female	80 (74.1)		30 (27.8)		13 (12.0)		4 (3.7)	
Parents' matrimonial status								
Married	144 (76.6)	NS	75 (39.9)	NS	38 (20.2)	NS	16 (8.5)	< .001
Concubinage	5 (83.3)		2 (33.3)		3 (50.0)		2 (33.3)	
Divorced	21 (95.5)		15 (68.2)		6 (27.3)		7 (31.8)	
Widower/widow	14 (93.3)		6 (40.0)		4 (26.7)		4 (26.7)	
Total (n=231)	184 (79.7)		98 (42.4)		51 (22.1)		29 (12.6)	

school girls in our study are not married and have been educated in the highlands. So this precocity of the first sexual intercourse could be explained by four local culture elements, which are among the determinants of entry of adolescents in sexual life and can expose them to sexual abuse. First, the traditional concept of "emancipation" defines the passage to adulthood, not by the age but by the changes of the body. However, the entry into sexual life refers to the glorious challenge to take the leap and face its consequences. Second, the first sexual intercourse takes place, unbeknownst to the parents, usually with an older partner, in an adult environment where intergenerational sex is tolerated. Third, a movement maintaining ambient sexual freedom is settling. Finally, it is about implicit sexual transactions, a "play tricks". Both genders are trying to trap one another, in expectancy of sexual intercourse for male and profits for female. It often results in the slide into the commercial sexual exploitation [30]. The same idea of emancipation and freedom could also, for the time being, explain the precocity of drug use among girls in our study.

3.2.1 Alcohol

Prevalence of alcohol consumption among Antananarivo students equalizes Côte d'Ivoire's (79.4% [18]) and Gabon's (55.5% [19]). Beer is the student's preferred alcoholic beverage, agreeing with studies conducted in Africa [18,31]. This could be explained by its affordability (2,000 MGA for a bottle of beer versus 6,000 MGA for a bottle of wine in Madagascar). Alcohol use among adolescents is influenced by family members, such as in Iran. There is evidence that parents' alcoholism has more impact than siblings' or friends' [20].

3.2.2 Smoking

The prevalence of tobacco use for smoking in this study is high compared to those of the various studies conducted in Africa (from 6.5 to 22.6% [21-23,18]) and France (35%). This difference is probably due to the younger age of the respondents in France where the mean age was 14.1±1.8 years [32]. Young people buy their cigarettes from friends because the law prohibits the sale of tobacco to minors [33]. Nevertheless sellers come second to provide youth, as in Quebec [34]. The smoking initiation is made through friends: this is due to the imitation of the peers and the sense of belonging [13,32].

3.2.3 Sexual behaviour

Mean age of first sexual intercourse is similar to other studies' [35-37]. The age at first intercourse turns out to be a critical dimension to study as more young people become sexually active: the sooner they begin, the more they will have opportunities (in terms of years) to have sex, the more they are likely to have multiple sexual partners [38]. Moreover, those who have sex early in adolescence are more at risk of a sexually transmitted disease or unintended pregnancy [39]. The mean number of sexual partners over the past twelve months is not well specified in the other surveys, which give value ranges [37,40,41]. But our students have more sexual partners compared to those of other studies: in Burkina Faso it applied to 6% of girls and one third of boys [41]; in Canada, it applied to 40% for boys against 27% for girls making a total of 33% [40]; in England in 2013 it concerned 33.7% of boys against 26.7% for girls [37]. This is due to the spread of adult movies in a US study [42]. The context of hypersexualisation also gaining ground. It is present in various commercials, clips, magazines and Internet [43,44]. Girls are less likely to ask their partners to use condoms as demonstrated in some studies [41]. In fact, girls assign the responsibility of condom use to their partners. Moreover, they trust their partners and boys are more worried about facing their girldriends' pregnancy. Besides, female condoms are not well known and prove to be expensive. However, in South Africa, girls are more likely to use condoms because they worry about contracting some diseases in a land where Human Immunodeficiency Virus (HIV) prevalence is high [35]. In all, young people's sexuality in the urban district of Antananarivo is practiced in conditions exposing them to sexually transmitted diseases and HIV.

In this study, love and experimenting are the most cited reasons for having sex. Mburano R brought up reasons such as curiosity first, and then coerced sex in Cameroon [45]. Coerced sex is also a reality among adolescents. The context of our youth is not so different to the effect that in a survey conducted in the suburbs of Antananarivo in 2006, a quarter of girls aged 15-24 reported they had sexual intercourse which they had not consented [46]. On the other hand, pregnancies and abortions occur in a context of relative emotional stability. The girls interviewed had started an affair with the biological father for at least 3 months when they resorted to abortion.

These were no transient relationships, but relationships assumed to last. In Antananarivo, all categories of women seem concerned with abortion but particularly younger, single and still in school [47]. Thus our youth need support and counselling, especially regarding the love they experience.

Unlike our results where the marital status of the parents have no influence on sexuality in Cameroon the composition of the family and living standards of the home proved to be the most consistently associated with risky sexual behaviour [45].

3.2.4 Drug use

Considering the prices and the difficulty in obtaining these drugs, cannabis is by far the most used in this study and all over the world [20,48,49]. Cannabis is cheaper, can be obtained anywhere, its conservation is easier, and ultimately its use can be disguised in cigarette smoking. Young people obtain drugs via their friends, according to Mimbila-Mayi M. Malagasy young people do not ask their families to supply them with drug, but prefer to buy it themselves, because of illicit trade of cannabis and the evidence drugs are still taboo, reflecting some Malagasy traditional values [50]. As for parental status, the situation is different in Gabon since young people living with both parents are more likely to use drugs [19].

In the present work, curiosity encompassing desire to experiment is the main reason for drug use. In Europe, curiosity in 64% of cases, and the search for excitement (37%) are in the leading group of motivations for drug use [48]. According to Zuckerman's behaviourist model, curiosity and desire to experiment appear in the scale of "strong sensations" [51].

3.2.5 Sources of information

The mass media convey more knowledge on sexuality in Burkina Faso [41]. In this work, internet was designated primarily as a source of information on sexuality. This is due to the expansion of Information and Communications Technology and the easy access to internet in the capital. In Europe also, internet is a powerful source of information and communication, as well as an integrated part of the social environment of young people. Provision of generalist Youth Information and Counselling online, as well as orientation on the Internet are new tasks, which are complementary to existing Youth Information work [52]. But in Madagascar, such counselling centres or networking are still uncommon.

4. CONCLUSION

This study aimed at having high school students' risky behaviour patterns in the urban district of Antananarivo. It demonstrates a high prevalence of alcohol use as well as multiple risks taking among the high school students of Antananarivo. Influenced by their peers, while having the possibility to afford alcohol, drugs or cigarettes, urban high schools students in Antananarivo engage in risky practices early. Many players are on the scene to influence youth on the practice of risky behaviour. Based on our results, the following suggestions are issued:

4.1 Alcohol

Educators should further inform young people on the short- and long-term harmful effects of alcohol. A free choice should be left to well-informed young people, without resorting to prohibition which grows curiosity. Furthermore, parents play a key role in the behaviour of their children. Thus, they should not drink in front of their children to have more credibility. Besides, existing legislation regarding the sale of alcohol and the regulation of the places where young people are more likely to drink must be applied. The National Police, the drug squad, the vice squad and the municipality should ensure their implementation. Finally, we have to develop the competence of parents on the subject through communication campaigns, conferences on alcoholic products, on adolescence etc., within family or parents associations, counselling places that may be the same than those for young people.

4.2 Smoking and Drug Use

Peer approach is an effective way in sensitizing high school students on the importance of not smoking or quitting smoking. It is necessary to recruit young people who are convinced of the harmful effects of cigarettes, train them so they can become ambassadors for tobacco control.

4.3 Sexual Behaviour

Reproductive health courses should be incorporated in the college curriculum to satisfy

the curiosity of young people and guide them through the various physical and psychological changes. Condom use should also be promoted. Within schools, we should set up counselling centres to assist young people including the ones not yet indulged in sexual activity, develop appropriate care for drug users with a qualified and competent staff including psychologists.

4.4 Sources of Information

The doctors in charge of youth counselling and the parents should know the media habits and websites where adolescents get informed on the topics. In addition, physicians should increase their knowledge on the latest data or conduct research on the influence of media on adolescent risky behaviours for better management. The use of NICTs as tools to support youth could be done through attractive websites where young people can access information, counselling and support to tackle the burden of the practice of risky behaviours.

Education of males on their expenditures and management for the future could help addressing multiple risk behaviours. A multidisciplinary approach should also be applied. Education for Adolescent Health should definitely go through parent support activities that they can play their parental roles. They are five in number. The first consists in strengthening the family ties (emotional role); the second is used to monitor behaviours (beacon role); the third is to respect and develop the personality of the adolescent (supporting role); the fourth is to be a model (role model) and finally the fifth falls within the protection (protective role) [53]. National education should further develop educational books focused on the social responsibility of adolescents. These books could be used by parents, teachers at school, the media but also by adolescents.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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