Sports participation and drug use among young people in Mauritius

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ABSTRACT
The aim of this study was to investigate the relation between drug use and sports participation among young people (14–25 years old) living in Mauritius. Data were collected through a self-administered questionnaire from a stratified sample of young people residing in Mauritius. According to the results, the strongest predictor of reporting drug use was age, recording an odds ratio of 2.50 and showing a positive effect. Drug usage was a negative predictor, meaning that the more use of drug, the less sport activity. In addition, gender predicted the respondents' sports activity. This article concludes that sports can protect young people in Mauritius from getting into drug use, and policy-makers should focus more attention in tackling the gender disparities in sports participation.

Introduction
Mauritius is a small island state situated in the Indian Ocean, towards north-east of Madagascar. The island has a population of about 1.2 million, of which about 50% are females. The population of young people living in Mauritius could be estimated to be around 300,000 (about 50% females) representing approximately 25% of the total Mauritian population (Ministry of Youth & Sports-Mauritius, 2014). The country is often described as a multi-ethnic, multi-cultural and democratic state. The ethnic and religious compositions of Mauritius are reported as follows: Ethnicity: Indo-Mauritian 68%, Creole 27%, Sino-Mauritian 3%, Franco-Mauritian 2%; and Religion: Hindu 48.5%, Roman Catholic 26.3%, Muslim 17.3%, other Christian 6.4%, other .6%, none .7%, unspecified .1% (USAID, 2014).

Mauritius has evolved from being a mono-crop, sugarcane-based economy to a much-diversified one. While sugar production is declining in its relative importance, the economy of the country currently rests on tourism, textiles and financial services, and is expanding into other sectors such as fish processing and property development. Over the last decade, the country’s economy has maintained an average GDP growth of about 4% owing to its good macroeconomic policies and strong institutions (Rambaree & Knez, 2016; Zafar, 2011). Side by side with its economic development, Mauritius has continuously tried to develop its welfare state, through universal welfare provisions such as free education, free health care and a gradual increase in the government expenditure on social protection schemes.

Over the last few decades, one of the major challenges of Mauritius has been about combating illicit drugs (thereafter referred to as drugs only) trafficking and usage in the country. As from 1982, the island is witnessing a rapid rise in the number of drug addicts. This rise is linked to an increase in drug
trafficking from a sudden expansion of air and sea connections for industrial development (UNODC, 2010; Krug & Pollard, 2014). In the year 2010, the United Nations Office of Crime and Drugs had listed Mauritius fourth in the classification of opiate use per capita in the world – after Afghanistan, Iran and Costa Rica (UNODC, 2010). Currently, Mauritius is classified among those countries having the highest per capita rates of opiate use in the world (Krug & Pollard, 2014). It is estimated that between 17,000 and 18,000 people are injecting drug users in Mauritius (Johnston, Saumtally, Corceal, Mahadoo, & Oodally, 2011; Krug & Pollard, 2014; L’Express, 2017). According to a report from the Mauritius Police Force, in 2015, there were a total of 3468 drug offences, among which cannabis offences accounted for 66%, heroin offences for 22%, and New Psychoactive Substances (synthetic drugs) offences for 12% (as reported in Ministry of Health & Quality of Life – Mauritius, 2016, p. 11).

Drug use and drug trafficking in Mauritius have therefore become a major social problem and a hard nut to crack for the government and policy-makers (L’Express, 2017). In particular, the use of and harm caused by New Psychoactive Substances among young people have become a major concern in the country. In this connection, the National Drug Observatory Report (Ministry of Health & Quality of Life – Mauritius, 2016) reports:

Among 435 patients admitted for suspected New Psychoactive Substance use in public health institutions, in the first half of 2016, 2% were aged less than 15 years, 76% were aged 15–29 years and 22% were aged 40 years … and over 8 secondary schools students were reported to have been involved in suspected drug use in schools. (pp. 14, 15)

Consequently, young people have become a main target for combating drug use in Mauritius. According to a report from the Ministry of Youth and Sports, the use of marijuana, heroin, psychotropic drugs and ecstasy has increased among young people in Mauritius (Ministry of Youth & Sports-Mauritius, 2014). A study undertaken in 2008 by the National AIDS Secretariat and Rogers Group, among a sample of 1000 Mauritian young people of 15–24 years old, reported that 20% of the sample declared taking ‘soft drugs’ (cannabis/marijuana/gandia/oral medication) while 4% admitted that they take ‘hard drugs’ (cocaine/heroin/subutex/ ecstasy) (WHO, 2013). Another study undertaken in 2011 reported that, 10.9% of people who injected drugs were under the age of 24, which represented an increase from the 2009 survey results of 6.7% (Krug & Pollard, 2014).

The Ministry of Youth and Sports with the support of various stakeholders such as parents and teachers is fully engaged in combating against drug which is becoming more complex with the emergence of New Psychoactive Drugs in Mauritius (Government of Mauritius, 2016). In almost all societies, the well-being of young people is promoted through health enhancing activities, such as sports and recreational activities. However, the strength of relationship between sports participation and drug usage varies both within and across different populations, as well as between different sociocultural contexts (Rambaree & Auchoybur, 2009).

Within this context, this study investigates the relation between sports participation and drug use among young people living in Mauritius. This article therefore answers the following specific research questions regarding young people in Mauritius: (a) what factors predict their drug use reporting; (b) what factors predict their sports activity; and, (c) what kind of relationship exist between their drug use reporting and sports participation.

**Drugs and sports in society**

Some social scientists consider drug usage – as well as participation in sports – as social phenomena related to a myriad of sociocultural factors. They identify sociocultural factors, such as gender, ethnicity, poverty, and marginalisation to explain drug usage and sports participation among different section of human population. In particular, they argue that sociocultural factors play an important role in the initiation and maintenance of drug use (Jiloha, 2009; Kwan, Bobko, Faulkner, Donnelly, & Cairney, 2014), as well as in sports participation (Wilson, 2002).

From this perspective, the ‘Providing Alternatives’ model, which comprises sports and artistic activities with the goal of promoting a healthy lifestyle to keep young people away from drugs is considered
as a promising preventative model in working with young people (Moreira, Vóvio, & De Micheli, 2015).
For instance, Mellanby, Rees, and Tripp (2000) opine that programmes for young people using sports
to promote drug prevention and community engagement can have important effects on the outcome.
In a similar vein, Lisha, Crano, and Delucchi (2014), conclude that youth involved in sports are less
likely to use marijuana over time. Moreover, Pate, Trost, Levin, and Dowda (2000) report that, youth
who participate in organized sports at school or in their communities are less likely to engage in drug
use than non-sports participants. In addition, the Canadian Centre on Substance Abuse (2014) report
that sport participation, in general, is associated with an increased experience with alcohol use, while
it appears to be protective against most drug use. From a systematic review of longitudinal studies,
Kwan et al. (2014) find that sport participation is positively associated with decreased drug use (80%).

To maintain a positive correlation between drug abuse and sport activity is yet problematic; several
factors influence this relationship. Studies from different sociocultural contexts report mixed relationship
between sports participation and drug usage among young people (Rambaree & Auchoybur, 2009).
Similarly, Clark, Camire, Wade, and Cairney (2015) posit that, ‘… when we look critically at the evidence
linking sport to positive development, the results are often mixed’ (p. 224). For instance, it is commonly
known that some elite athletes use illicit drugs to enhance their performances (Creado & Reardon, 2016).
In this sense, it is argued that sociocultural variables such as, gender, class and status, have profound
effect on drug use among both sports participants and non-participants (McCrylal, Higgins, & Percy,
2007; Jiloha, 2009; Kloos, Weller, Chan, & Weller, 2009; Abdu-Raheem, 2013). Thus, in order to have a
better understanding on sports participation and drug usage within a context, it becomes important
to focus on the socio-economic and cultural factors prevailing within that particular context.

Method
Participants and procedure
This article is based on data from a youth survey that were completed in December 2015. Volunteers
– working either as teachers in secondary schools or youth officers at the Ministry of Youth and Sports
– collected data from both rural and urban parts of the island of Mauritius under the supervision of the
first author. A stratified sample of young people living in Mauritius by sex and location (urban or rural)
was designed. The research team carefully followed ethical considerations, such as informed voluntary
participation, consents of all stakeholders and anonymous reporting. A pilot test with 20 questionnaires
was undertaken with minor changes made in the final self-administered questionnaire.

Statistical treatment
For this study, linear and logistic regression analysis, as well as Multivariate Analysis of Variance (MANOVA)
were carried out. Participants’ use or non-use of drugs and participation in sports activities were the
dependent variables, while gender, age, perceived health, ethnicity and attitudes towards drugs consti-
tuted the independent variables. In total, 454 questionnaires (x 39 questions) were analysed, which well
exceeded the requirement of at least 15 individuals per predictor in regression analysis (Osborne, 2017).

Instruments
Participants’ background: The background instrument comprised five items about socio-demographic
data including the respondent’s age, gender, marital status, ethnicity and educational level.
Perceived physical fitness was measured by using a single item – ‘How would you rate your health.’
This was assessed on a four-point scale that ranges from 1 (Not healthy at all) to 4 (Very healthy). Several
studies using large samples have demonstrated the ability of a single item subjective health rating
to detect variance in perceived health status (Mossey & Shapiro, 1982; Ware, Davies-Avery, & Donald,
1978). After reviewing almost 40 studies of general health perceptions, Ware et al. (1978) concluded
that such ratings appeared to be both reliable and reproducible. For the purpose of the present study, the response options were collapsed into two categories – ‘Healthy’ and ‘Not Healthy’.

**Measures of drug use:** This part of the questionnaire contained one single item. Participants were asked to indicate if they have used drugs for non-medical reason, which was stated as: ‘Please indicate whether you have used any drug other than those prescribed for medical reasons’. This item was answered by participants using a five-point Likert scale; 1 = Never, 2 = Once only, 3 = A few times, 4 = Regularly, 5 = Almost all the time. For the purpose of the present study, the response options were collapsed into two categories – ‘Yes’ and ‘No’.

**Measures of sport activity:** The items used in this paper came from a WHO cross-national survey of Health Behaviour in School-children (Currie, 1998). Sports participation was measured by asking the subjects questions, for example if they ‘Participate in sports/exercise in a club/association; ‘Participate in sports/exercise in a club/association; ‘Participate in activities organized by the Ministry of Youth and Sports’. The items were answered by the participants using a five-point Likert scale; 1 = Daily, 2 = Weekly, 3 = Monthly, 4 = Yearly, 5 = Never. For the purpose of the present study, the response options were both collapsed into two categories – ‘Yes’ and ‘No’. After the draft survey was reduced, calculated the internal consistency of the final survey. In the current study, the Cronbach alpha coefficient was .75, indicating that the test items or survey are consistent and seem to measure the same hypothetical construction or latent variable.

**Knowledge, Attitudes and Beliefs (KAB)** were based on Bryan, Moran, Farrell, and O’Brien (2000). The draft survey was reduced to 20 KAB questions and participants were asked to answer the questions regarding their attitudes to drug use, such as; ‘Our society is too tolerant towards drug users; ‘Occasional use of cannabis is not really dangerous, ‘It is normal that young people will try drugs at least once, ‘Reports about the extent of drug usage amongst young people are exaggerated by the media’. The items were answered using a seven-point Likert scale; 1 = Disagree strongly, 2 = Don’t agree, 3 = Agree strongly, 4 = Agree moderately, 5 = Agree slightly, 6 = Don’t know, and 7 = I don’t care. For the purpose of the present study, the response options were collapsed into two categories, ‘Agree’ and ‘Disagree’. In the current study, the Cronbach alpha coefficient was .81.

**Results**

Respondent characteristics performed by descriptive and frequencies analysis. The majority of the 454 study participants with 65.6% were female, male 31.9%, transgender 1.5 and .9% missing data, with 77.3% were from age range of 14–18 and 22.7% from the age range of 19–25. Accordingly, participants had an educational levels ranging from: Incomplete Primary Level (.04%), CPE (1.1%), Incomplete Secondary Level (9.7%), SC/Basic Secondary Level (45.6%) HSC/Advanced Secondary Level (38.3%), Tertiary Level (3.3%) and no answer was given for 1.5%. Participant’s marital status 95.8% were Single, 1.8% Married, 1.5% Cohabitating and .9% Missing data. The respondent came from different ethnicity, .09% Sino-Mauritian, 8.1% Creole, 1.5% Franco-Mauritian, 61.0% Hindu, Muslim 17.4, Mixed 5.1%, other 3.1% and 2.0% admitted they don’t know. Of them who reported that used drug were .00% chino-Mauritian, 2.4% Creole, 9.8% Franco-Mauritian, 48.8% Hindu, Muslim 17.1, Mixed 17.1%, other .00 and 4.9% who consider that they don’t know their ethnicity.

**Respondents’ drugs usage**

Direct logistic regression was performed to assess the impact of a number of factors on the likelihood that respondents would report that they used drugs. The model contained six independent variables (age, gender, ethnicity total sum of sport activity, total sum of attitudes towards drug and perceived health). The full model containing all predictors was statistically significant ($\chi^2 (6, N = 429) = 41.9$, $p < .0001$), indicating that the model was able to distinguish between respondents who reported and did not report using drugs for non-medical reasons. The model as a whole explained between 9.3% (Cox and Snell $R^2$) and 21% (Nagelkerke $R^2$) of the variance in drug usage, and correctly classified 92.3%
of cases. As shown in Table 1, four of the independent variables made a unique statistically significant
contribution to the model (age, total sum of sport activity, total sum of attitudes towards drug, and
perceived health). The strongest predictor of reporting a using drug was age, recording an odds ratio
of 2.50 and shows a positive effect. This indicated that older respondents have 2.50 higher risk to use
drug then other respondent.

Respondents’ sport activity

By linear regression analysis predicting respondents’ sport activity six interpreters; use of drugs, gender,
age, ethnicity, perceived health and total sum of attitude towards drugs, were used. Preliminary analyses
were conducted to ensure no violation of the assumptions of normality, linearity, multi-collinearity and
homoscedasticity. It was indicated that 21.9% of the variance was predicted by the significant model ($F$
[6,427] = 19.97, $p$ = .000) and four out of six predictors made a unique significant contribution: Gender,
age, drug usage and attitude towards drugs predicted the respondents’ sport activity. Drug usage was
a negative predictor, in other words, the more use of drug, the less sport activity (Table 2).

Discussion

The strongest predictor of reporting drug use was age. Age was also an important factor in respondents’
sports participation. Evidence from a systematic review shows that participation in sport peaks during
early adolescence, around 11–13 years old, before declining through adolescence (Eime, Young, Harvey,
Charity, & Payne, 2013). In addition, studies from Canada have shown that drug users are at their peak
during this developmental period (Young et al., 2011; Clark et al., 2015). In the case of Mauritius, the
Ministry of Youth and Sports (2014) reports that not only sports participation, but also drug usage,
peaks among young people of age group between 16 and 17.

In particular, Arnett (1999) argues about three domains of conflicts related to the transitional period
from childhood to adulthood among young people; conflict with parents, mood disruptions, and risk
behaviour. In this sense, youth is viewed as a period during which young people struggle to establish

| Variable | B    | S.E. | Wald  | df  | Sig.  | Exp(B) | 95% C.I for Exp(B) |
|----------|------|------|-------|-----|-------|--------|-------------------|
| PH       | −.75 | .38  | 3.95  | 1   | .047  | .47     | .22 – .99         |
| SA       | −.59 | .24  | 6.39  | 1   | .011  | .55     | .35 – .88         |
| ATD      | −.98 | .34  | 8.49  | 1   | .004  | .38     | .20 – .73         |
| Gender   | −.28 | .37  | .56   | 1   | .456  | .76     | .36 – 1.57        |
| Age      | .92  | .39  | 5.64  | 1   | .025  | 2.50    | 1.12 – 5.58       |
| Ethnicity| .22  | .14  | 2.39  | 1   | .12   | 1.24    | .94 – 1.65        |
| Constant | 2.47 | 1.49 | 2.75  | 1   | .09   | 11.79   |                   |

Note: PH (Perceived Health), SA (Sport activity), ATD (Attitude towards drugs).

| Model enter | $R$  | $R^2$ | Unstand Coeff | Stand Coeff | $t$  | Sig. | Corr. | Collinearity Statistics |
|-------------|------|-------|---------------|-------------|------|------|-------|-------------------------|
| (Constant)  | .468 | .219  | B             | S.E.        | Beta | .36  | .71   | .000                    |
| PH          | .02  | .07   | .02           | .34         | .734 | .02  | .96   | 1.04                    |
| Drug usage  | −.51 | .12   | −.19          | −.432       | .000 | −.18 | .89   | 1.11                    |
| ATD         | .22  | .07   | .15           | .332        | .001 | .14  | .92   | 1.09                    |
| Gender      | .51  | .07   | .33           | .763        | .000 | .33  | .95   | 1.05                    |
| Age         | −.17 | .08   | −.09          | −.212       | .034 | −.09 | .96   | 1.04                    |
| Ethnicity   | .01  | .03   | .02           | .49         | .491 | .02  | .97   | 1.03                    |

Note: PH (Perceived Health) and ATD (Attitude towards drugs).
themselves as autonomous independent individuals. In addition, during the phase of adolescence, some young people challenge parental and societal values through more influential peer pressure and values. During their developmental period, some youth even try to break several societal boundaries, and sometimes act rebelliously against the societal and parents’ norm and values.

Furthermore, adolescence is known as a crucial developmental period, with the confluence of biological, psychological and social changes that can predispose to the occurrence of mood disruptions among young people (Quello, Brady, & Sonne, 2005; Rocha, Zeni, Caetano, & Kieling, 2013). In this sense, young people are therefore often characterized as a period of both intra (bodily) and inter (societal) conflict. During the past decade, research results and clinical experience have converged in the recognition that unstable psychological conditions among young people commonly co-occur with substance use disorders (National Institute on Drug Abuse, 2003; Mohamad, Mohammad, Ali, & Awang, 2016).

The focus on young people as critical and vital periods emerged from a belief that young people require control from risk taking and cultivation through healthy behaviours and practices to grow safely into adulthood (Troen, 1985). Although the majority of young people can make informed decisions about themselves and their future, the critical age ranges defined as adolescence and youth have also been characterized as periods prone to influences in health risks from peers, media, cultural environment and so on (Rambaree, 2011). In a similar manner, Steinberg (2007) argues that thrill seeking, and the slow maturation of the cognitive-control system, which regulates these impulses, makes adolescence a time of heightened vulnerability for risky behaviours, such as substance abuse (cigarette, alcohol and drugs). The potential impact of specific risk and protective factors among young people changes with age in such a way that association with drug-abusing peers may be a more significant risk factor for an adolescent (Quello et al., 2005).

In this study, drug usage was a negative predictor, in other words, the more use of drug the less sport activity. This particular finding therefore corroborate with other studies where it has been found that young people who engage in the consumption of drugs, tend to participate less in organized sports at school or in their communities (Pate et al., 2000; Harcourt, Unglik, & Cook, 2012; Lisha et al., 2014). In particular, Pastor, Balaguer, Pons, and Garcia-Merita (2003) report that young people who participate more in sports have a positive effect on their mental wellbeing and therefore have better conditions to avoid getting into drug usage.

The government of Mauritius, through the Ministry of Youth and Sports, as well as the sports federations and various youth organisations put effort towards encouraging young people to practice sports as a means to adopt a drug-free lifestyle. Despite all the efforts, a study reports that, 59.4% of young people in Mauritius lacks exercise because of non-participation in sports and recreational activities (Ministry of Youth & Sports-Mauritius, 2014). Mauritius has a highly competitive education system, coexisting with relatively long after-school hours private tuitions (Ah-Teck & Starr, 2012). During their final years of secondary and tertiary levels examination years, many young people cannot afford to participate in sports activities mainly because of lack of time (Ministry of Youth & Sports-Mauritius, 2014). Perhaps, educational stress and lack of sports/recreational activities make young people in Mauritius more vulnerable to drug use.

Another main finding of this study is that, gender predicted the respondents’ sport activity. Broadly, gender describes the socially constructed characteristics of women and men, in contrast to those that are biologically determined. Several studies from Mauritius have confirmed that females are still minority participants in sports, because of prevailing societal norms (Rambaree & Knez, 2016; Rambaree, Knez, & Auchoybur, 2012; Ramtohul, 2010; Rambaree & Aucbhybur, 2009). In fact, the Mauritian National Action Plan on Physical Activity 2011–2014, reports that in 2009 the percentage of men and women practising sufficient leisure physical activity in Mauritius was 23.2% and 10.9%, respectively (Ministry of Health and Quality of Life – Mauritius, 2011). Rambaree and Auchoybur (2009) found that male students from University of Mauritius were four times more likely to participate in sport activities when compared to their female counterparts. Mauritius is a highly patriarchal society, where gender has significant effects on various aspects of young people’s life, including sports participation.
In this study on Mauritian young people, sports participation predicted less drug usage and negative attitude towards drugs usage. Previous studies have reported that the development of positive attitudes towards drugs appears to be a combination of risk factors related to young people's social environment (Mousavi, Garcia, Jimmefors, Archer, & Ewalds-Kvist, 2014; Mohamad et al., 2016). Changes in young people's attitude towards drugs are therefore a vital attempt to balance their social environment (Helkama, Myllyniemi, & Liebkind, 2004). It is commonly known that every individual young person wants to conform to the group in order to avoid exclusion, express feelings and facilitate interactions in social situations (Aronson, Wilson, & Akert, 2005; Mohamad et al., 2016; Mousavi et al., 2014; Stattin & Kerr, 2000).

In this sense, sports clubs and associations for young people need to be a vital target in sensitisation campaigns against drug. However, further study needs to investigate similarities and differences in the associations between risk factors and positive attitudes towards drugs and drug use, and recognize any potential new group to prevent or alleviate the problem. Such studies may be of importance when it comes to assessing which individuals are at increased risk for developing drug abuse and which specific risk factors are related to these behaviours at different ages.

Limitations and strengths
Findings from the current study were based on cross-sectional data; and therefore no causal direction can be specified for questions such as whether lack of sport activity is the cause of drug use among the studied sample. Furthermore, self-assessments are subjective measures and can be affected by both personality traits and inability to respond honestly (Watson, Clark, & Tellegen, 1988). Although 39 questions were used in this study, the gathered data still cannot provide all needed information about substance use and associated problems experienced by young people in Mauritius. Nevertheless, well-validated and reliable instruments formed the basis of the results, which must have a positive effect on the reliability of the findings.

In addition, the questionnaires were in English, which means that all the allegations retained their original meaning. By choosing statistic method like multiple regression and logistic regression, which were ideal for the investigation of more complex real life, rather than laboratory-based, research questions, the methods allowed the study to have a control over multi-collinearity, singularity, outliers, normality, linearity, homoscedasticity and independence of residuals. Even internal consistency of all the items was measured by means of Cronbach's alpha in order to enhance the rigour in the analysis process.

For such a study area, it is important to have a broader and deeper understanding of young peoples’ experiences of pro-drugs and their attitudes towards drug use, sport activity and their relation with drug use. Future research should therefore include the impact of a cross-cultural comparison of young people's drug use to reveal what comes by nature and what is cultural. Continued research in this area can provide societal actors with more accurate guidance on which aspects are most important, when it comes to preventing drug usage among young people.

Conclusion
This study concludes with three main findings that have major implications for the wellbeing of young people in Mauritius. Firstly, it shows that age is an important factor in drug usage among young people. Secondly, it finds that sports can help to prevent young people in getting into drug use. Finally, it reports that young females are less likely to participate in sports as compared to young males. Understanding the connections between sport participation and drug usage, using a sociocultural lens, could advance efforts towards the promotion of a healthy lifestyle among young people (Clark et al., 2015). Policy-makers, in Mauritius, therefore need to continue with their efforts towards widening the participation of young people in sport activities and campaigning against drug usage through youth associations and clubs. In addition, Mauritian policy makers need to have not only policy guidelines, but also clear and concrete actions for breaking the glass ceiling regarding women’s participation, particularly in sports.
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Disclosure statement

No potential conflict of interest was reported by the authors.

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