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Mialon Anaïs

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UNIVERSITE DE LAUSANNE - FACULTE DE BIOLOGIE ET DE MEDECINE

Département Universitaire de Médecine et Santé Communautaire
Institut de Médecine Sociale et Préventive

Sexual dysfunction among young men: prevalence and associated factors.

THESE

préparée sous la direction du Docteur Juan Carles Suris
(avec la co-direction du Professeur Pierre-André Michaud)

et présentée à la Faculté de biologie et de médecine de
l'Université de Lausanne pour l'obtention du grade de

DOCTEUR EN MEDECINE

par

Anaïs MIALON

Médecin diplômé de la Confédération Suisse
Originaire de Nyon (Vaud)

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Original article

Sexual Dysfunctions Among Young Men: Prevalence and Associated Factors

Anaïs Mialon, M.D.[a], André Berchtold, Ph.D.[a], Pierre-André Michaud, M.D.[a], Gerhard Gmel, Ph.D.[b], and Joan-Carles Suris, M.D., Ph.D.[a,*]

[a] *Research Group on Adolescent Health, Institute of Social and Preventive Medicine, Centre Hospitalier Universitaire Vaudois and University of Lausanne, Lausanne, Switzerland*

[b] *Department of Community Medicine and Health, Alcohol Treatment Center, Lausanne University Hospital, Lausanne, Switzerland*

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A B S T R A C T

Purpose: The purposes of this study are to measure the prevalence of premature ejaculation (PE) and erectile dysfunction (ED) among a population of Swiss young men and to assess which factors are associated with these sexual dysfunctions in this age-group.

Methods: For each condition (PE and ED), we performed separate analyses comparing young men suffering from the condition with those who were not. Groups were compared for substance use (tobacco, alcohol, cannabis, other illegal drugs, and medication without a prescription), self-reported body mass index, sexual orientation, physical activity, professional activity, sexual experience (sexual life length and age at first intercourse), depression status, mental health, and physical health in a bivariate analysis. We then used a log-linear analysis to consider all significant variables simultaneously.

Results: Prevalence rates for PE and ED were 11% and 30%, respectively. Poor mental health was the only variable to have a direct association with both conditions after controlling for potential confounders. In addition, PE was directly associated with tobacco, illegal drugs, professional activity, and physical activity, whereas ED was directly linked with medication without a prescription, length of sexual life, and physical health.

Conclusions: In Switzerland, one-third of young men suffer from at least one sexual dysfunction. Multiple health-compromising factors are associated with these dysfunctions. These should act as red flags for health professionals to encourage them to take any opportunity to talk about sexuality with their young male patients.

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IMPLICATIONS AND CONTRIBUTION

One-third of Swiss young men report sexual troubles such as PE or ED. Our results reveal that these troubles are related to poor mental health, overall substance use, and low physical activity. General practitioners should take any opportunity to address sexuality with their young male patients.

Sexual dysfunctions represent a serious and underdiagnosed concern in the general male population [1]. Globally, a sexual dysfunction can be described as a reduction in desire or libido, a diminished arousal, a decline in the frequency of intercourse, or an undesirable delay or inability to achieve orgasm [2]. In this article, masculine sexual dysfunctions will be limited to premature ejaculation (PE) and erectile dysfunction (ED) because they are among the most frequent masculine sexual troubles [3].

According to different studies [3–5], the prevalence rate of PE ranges from 17% to 30% and is reported to be associated with depression and stress [6–10]. Aging does not seem to be associated with PE [11]; in fact, a higher prevalence has been shown in male subjects aged <25 years [12], suggesting that PE can be more frequent at the beginning of sexual life.

The prevalence rate of ED ranges from 2% to >80%, depending on men's age [3,13,14]. Contrary to PE, ED appears to be principally associated with aging. Some studies [15,16] underline that comorbidities such as diabetes mellitus, cardiovascular or neurological pathologies, and medication use are also linked with ED. In addition, ED has been described to be associated with obesity or physical inactivity [17,18]. Because all these condi-

* Address correspondence to: Joan-Carles Suris, M.D., Ph.D., Research Group on Adolescent Health, Institute of Social and Preventive Medicine, Biopôle 1, Route de la Corniche 2, 1066 Epalinges, Switzerland.

E-mail address: joan-carles.suris@chuv.ch (J.C. Suris).

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tions are frequently associated with aging, studies regarding ED tend to be more frequently carried out among middle-aged and elderly men.

Mental health has also been described to be associated with sexual dysfunctions. The prevalence of sexual problems in patients aged 28–35 years with depression has been reported to be twice more frequent than in control subjects [19], and side effects of psychoactive drugs are also known to have an impact on sexual function [2]. In addition, among adolescents meeting criteria for major depression, substance use and risky sexual behaviors have been identified as associated factors [20,21]. However, sexual dysfunction may also have an effect on mental health. ED has been described to have an influence on quality of life [3], and we can then presume that young men with sexual dysfunction may be in poorer mental health because of their sexual troubles.

Studies report a possible association between substance use and sexual dysfunction. PE is described to be linked with high alcohol consumption and former smoking [8]. ED is reported to be linked not only with alcohol and tobacco use [22] but also with cannabis [23]. The role of other illegal drugs is complex because they are supposed to increase not only ED but also ejaculation latency [24]. However, when existing studies evaluate the link between sexual dysfunction and substance use, they do not control for other potentially associated factors such as body mass index (BMI), physical activity, or mental status. In addition, most of the published studies refer to a wide range of age-groups representing the overall population and do not describe associated factors according to age. Whether variables such as substance use, BMI, physical activity, or mental health are specifically associated with sexual dysfunction among young men remains to be investigated.

Although men report to be open to discuss such topics with their general practitioner [1,10], consultations regarding sexual dysfunction are scarce [6,12], especially among young people [25,26]. This fact can explain, at least in part, the lack of research in this age-group. Considering that sexual dysfunction is reported to have an impact on quality of life [3] and that its associated factors among young men are not clear, the aims of the present study are as follows: first, to measure the prevalence of PE and ED among a sample of Swiss young men, and, second, to assess which variables are associated with sexual dysfunctions in this age-group. We hypothesize that factors such as substance use, low physical activity, high BMI, or poor mental health could play a role.

Methods

Every Swiss man aged 18–25 years is called up for a 2-day investigation plan (including medical screening) to evaluate his military capability. From September 2010 to May 2011, young men from Lausanne's and Zürich's recruitment centers (N = 9,761) were invited, during their medical evaluation, to participate in a study concerning substance use among youths (Cohort Study on Substance Use Risk Factors). Of them, 9,098 answered a short anonymous self-administered questionnaire. If these men agreed to continue after filling in this first part, they were mailed the entire questionnaire at home a few days later. Of the 5,276 youths who agreed to receive the entire survey, 3,886 completed it (response rate 73.6%).

Because the purpose of this article was to assess sexual dysfunction, we analyzed only sexually active men (N = 2,507, 64.5%) and divided them according to the presence or absence of PE or ED. PE was evaluated by the two questions classifying men with PE in the Premature Ejaculation Prevalence and Attitude (PEPA) survey [12]. PE was considered positive when the control over ejaculation was self-evaluated as fair or poor and when ejaculatory latency was considered to be a problem for the man, his partner, or both of them. ED was assessed by the 5-item version of the International Index of Erectile Function (IIEF-5). We performed a bivariate analysis, with ED considered present if IIEF-5 score was <22 and compared it with IIEF-5 score of <18. Because results did not differ statistically, ED was considered present if the IIEF-5 score was <22, as validated in the literature and corresponding to mild ED or worse [27]. All questions regarding both dysfunctions were related to the experience of the participants in the past 6 months. PEPA questions and IIEF-5 were chosen because of their known validity and reliability [12,27,28].

We used generic quantity–frequency instruments [29] for tobacco, alcohol, and cannabis use in the previous 12 months. Alcohol misuse, reported as binge drinking, was defined as drinking six or more alcohol units (international alcohol unit = 10 g of ethanol) per occasion. We designed three categories: those who had not misused alcohol, those who misused alcohol less than weekly (reported as occasional users), and those who misused at

Table 1
Description of the sample (N = 2,507)

Age (mean in years)	19.58 (±1.29)
Tobacco use	
No use	43.1
Occasional use	26.0
Daily use	30.9
Alcohol misuse	
No misuse	16.7
Occasional misuse	57.2
Frequent misuse	26.1
Cannabis use	
No use	66.0
Occasional use	22.9
Frequent use	11.1
Illegal drug use (at least once)	20.6
Medication without prescription (at least once)	11.3
BMI (>25)	20.2
Sexual orientation (heterosexuals)	96.8
Physical activity	
Low	7.2
Moderate	24.3
High	68.4
Professional activity	
None	10.5
Working	45.5
Studying	44.0
Sexual life	
<2 years	34.3
2–4 years	35.0
>4 years	30.7
Age at first intercourse (<16 years)	26.3
MDI depression rating scale	
No	93.6
Mild	2.7
Moderate	1.5
Severe	2.2
SF-12 score	
Mental health score (mean)	48.98 (48.63–49.32)
Physical health score (mean)	54.90 (54.69–55.11)
Premature ejaculation	11.4
Erectile dysfunction	29.9

BMI = body mass index; MDI = Major Depression Inventory; SF-12 = Short-Form Health Survey.

least weekly (frequent users). Cannabis consumption was assessed according to the same three categories (no cannabis use, cannabis use less than weekly, cannabis use at least weekly), and smoking was divided into no smoking, occasional (less than daily), and daily smoking. The use of illegal drugs (magic mushrooms, hallucinogens, amphetamines, cocaine, heroin, ketamine, γ-hydroxybutyric acid, poppers, speed, research chemicals, inhalants, *Salvia divinorum*) was dichotomized into never and ever use in their life. The same was done for medications without a prescription (sleeping pills, anxiolytics, pain killers with opiates, amphetamines, antidepressants, beta-blockers). We decided to analyze illegal drugs and medication without a prescription separately because their accessibility is very different [30]. Concerning sexual orientation, with the majority self-reporting as heterosexual on the survey (96.8%), we divided men into heterosexuals and others. Age at first intercourse (<16/≥16 years old) and length of sexual life (defined as time since first sexual intercourse and divided into <2/2–4/>4 years) were used as proxies for sexual experience. The age of 16 years was chosen because it represents legal sexual majority in Switzerland and because sexual activity before 16 years of age has been described by certain authors as premature [31]. Professional activity was divided into three categories: none (unemployed, looking for a job, welfare beneficiary, disability pension), working (paid employment, apprenticeship), and studying (high school, university). BMI was calculated with self-reported data on height and weight, and was analyzed as a categorical variable representing overweight and obesity (>25) and other (≤25). Physical activity was estimated by the short form of the International Physical Activity Questionnaire [32] and was expressed as a low, moderate, or high score. The Short-Form Health Survey (SF-12) score [33] exploring physical and mental health was used as a continuous variable and was expressed as a mean. The Major Depression Inventory (MDI) [34] was chosen to evaluate depression because it can be scored diagnostically using the *Diagnostic and Statistical Manual of Mental Disorders,* 4th edition. It was used as a depression rating scale (absent, mild, moderate, or severe) to have an optimal overview of mental health.

For each condition (PE and ED), we performed separately a bivariate analysis comparing young men suffering or not suffering from the condition, with all identified potential associated variables. Results are provided as percentage and p value of the χ^2 test for categorical variables, and as mean, 95% confidence interval, and p value of the Student's t test for continuous variables. In a second step, we performed a multivariate analysis (results not shown) using all factors significantly associated at the 95% level, with the condition in the bivariate analysis. Given the fact that one of the end points of this article is the possible

Table 2
Bivariate analysis comparing men with and without premature ejaculation (PE)

Variable	Non-PE (%) N = 2,204	PE (%) N = 283	*p*
Age (mean in years)	19.57 (±1.28)	19.53 (±1.27)	.579
Tobacco use			.002
No use	43.3	42.1	
Occasional use	24.9	34.1	
Daily use	31.9	23.8	
Alcohol misuse			.040
No misuse	17.2	11.3	
Occasional misuse	56.7	62.4	
Frequent misuse	26.1	26.3	
Cannabis use			.015
No use	66.8	59.0	
Occasional use	22.2	29.7	
Frequent use	11.0	11.3	
Illegal drug use (at least once)	20.0	25.8	.023
Medication without prescription (at least once)	11.1	12.8	.394
BMI (>25)	20.6	15.3	.03
Sexual orientation (heterosexuals)	96.8	97.5	.494
Physical activity			.001
Low	7.0	8.8	
Moderate	23.4	33.2	
High	69.6	58.0	
Professional activity			.001
None	11.2	5.3	
Working	47.0	32.5	
Studying	41.8	62.2	
Sexual life			.102
<2 years	33.6	39.9	
2–4 years	35.5	31.4	
>4 years	30.9	28.6	
Age at first intercourse (<16 years)	26.6	23.7	.296
MDI depression rating scale			.009
No	94.2	89.0	
Mild	2.4	4.6	
Moderate	1.3	2.8	
Severe	2.1	3.5	
SF-12 score			
Mental health score (mean)	49.36 (39.6–59.2)	46.27 (36.5–56.0)	.001
Physical health score (mean)	54.90 (45.1–64.7)	55.10 (45.4–64.8)	.552

BMI = body mass index; MDI = Major Depression Inventory; SF-12 = Short-Form Health Survey.

relations between substance use and sexual dysfunction, the five considered substances were always included, even if they were not significant at the bivariate level. Because we do not postulate causality between the conditions and the factors, logistic regression was not a coherent choice. We chose then to rely on log-linear models. Starting from a saturated model, we used backward elimination to suppress nonsignificant links between variables. Results are presented as diagrams showing all remaining significant associations in the final models. Because log-linear models can be computed only on categorical variables, age, mental health, and physical health variables were categorized into four categories on the basis of the quartiles. Direct links refer to variables associated directly to the dysfunction, whereas indirect links refer to variables associated to the dysfunction through other variables. Data were analyzed using SPSS 19.0 (SPSS Inc., Chicago, IL). The study protocol was approved by the Ethics Committee of the University of Lausanne's Medical School.

Results

The description of the sample can be found in Table 1.

Premature ejaculation

The prevalence of PE in our sample was 11.4%. At the bivariate level (Table 2), the main difference between the PE and non-PE groups was the association between PE and alcohol, tobacco, cannabis, or illegal drug use. Both groups also differed in professional activity, physical activity, BMI, depression status, and mental health. Concerning the log-linear model of associations (Figure 1), a direct link was found between PE and tobacco and between PE and illegal drugs. Mental health, professional activity, and physical activity were also directly associated with PE. Cannabis use, alcohol misuse, and medication without a prescription were indirectly linked with PE through tobacco or illegal drugs. BMI and depression status also revealed an indirect association with PE.

Erectile dysfunction

The prevalence of ED in our sample was 29.9% (mild 25.5%, mild to moderate 3.6%, moderate .8%, and severe .1%). At the bivariate level (Table 3), the main difference between the ED and non-ED groups was the significant association with medication. The other studied substances were not significantly correlated with ED. Both groups differed in age, sexual experience, depression status, mental health, and physical health. In the log-linear model of associations (Figure 2), a direct link appeared between ED and medication without a prescription, sexual experience, mental health, and physical health. Alcohol misuse, tobacco, cannabis, and illegal drug use were indirectly associated with ED. Indirect links with depression, age, and age at first intercourse were also found.

Discussion

Our results reveal the prevalence rate of PE to be 11%. This is lower than what has been reported by some previously published studies in this age-group [3,5]. However, these studies used the DSM-IV definition of PE, which has been described to potentially affect the prevalence of PE [12]. In a study [12] conducted in the United States, Germany, and Italy, which used the same PEPA questions, the prevalence rate of PE among men aged 18–24 years was similar to our results. Concerning ED, its prevalence among our sample is almost 30%, which is consistent with the results of a previously published study using the same index (IIEF-5) in this age-group [14]. This last result is surprising, but it has to be underlined that the majority (25.5%) of these young men with ED report a mild dysfunction.

Among associated factors, mental health is the only variable to be directly associated both with PE and ED. As previously described [9], men reporting a sexual dysfunction are in poorer mental health than those not reporting any. In addition, our results also reveal an indirect association between depression and both sexual dysfunctions. However, whether young men are

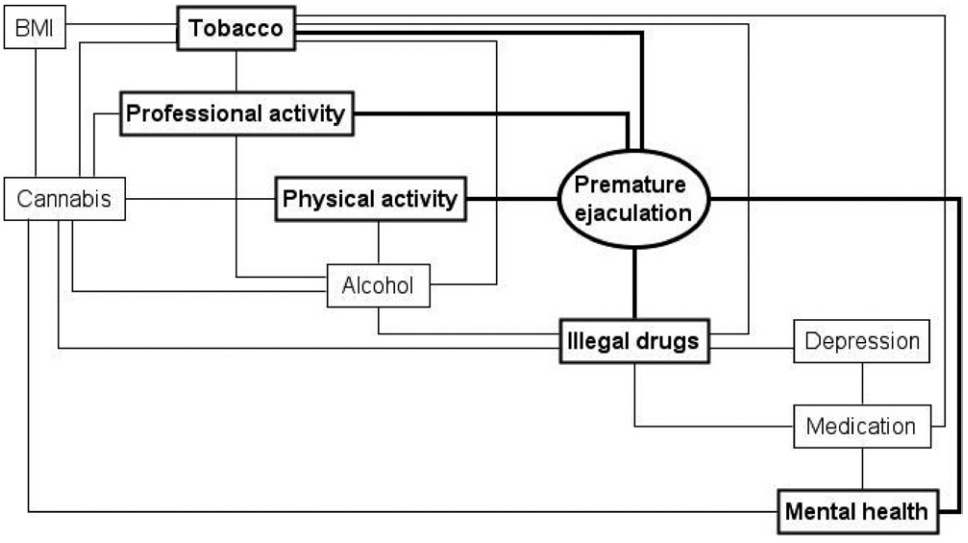

Figure 1. Factors directly or indirectly associated with premature ejaculation (PE) in the log-linear model. Direct links with PE appear in bold. For the purpose of clarity, possible direct associations between confounding variables mental health, BMI, depression, physical activity, and professional activity are not shown. Direct associations with PE are represented in bold.

Table 3
Bivariate analysis comparing men with and without erectile dysfunction (ED)

Variable	Non-ED (%) N = 1,742	ED (%) N = 743	*p*
Age (mean in years)	19.61 (±1.33)	19.49 (±1.17)	.024
Tobacco use			.626
No use	42.5	44.4	
Occasional use	26.0	26.0	
Daily use	31.5	29.7	
Alcohol misuse			.264
No use	16.6	16.9	
Occasional misuse	58.3	55.1	
Daily misuse	25.1	28.0	
Cannabis use			.388
No use	65.8	66.5	
Occasional use	23.6	21.5	
Daily use	10.6	12.0	
Illegal drug use (at least once)	20.5	20.9	.797
Medication without prescription (at least once)	10.0	14.2	.002
BMI (>25)	20.3	20.0	.876
Sexual orientation (heterosexuals)	97.2	96.0	.095
Physical activity			.668
Low	7.0	7.5	
Moderate	24.0	25.2	
High	69.0	67.3	
Professional activity			.257
None	10.5	10.5	
Working	44.5	47.9	
Studying	45.0	41.6	
Sexual life			.001
<2 years	31.5	40.8	
2–4 years	35.5	34.2	
>4 years	33.0	25.0	
Age at first intercourse (<16 years)	28.6	21.1	.001
MDI depression rating scale			.001
No	95.1	90.5	
Mild	2.1	4.0	
Moderate	1.1	2.3	
Severe	1.7	3.2	
SF-12 score			
Mental health score (mean)	49.78 (40.0–59.6)	47.18 (37.4–57.0)	.001
Physical health score (mean)	55.15 (45.4–64.9)	54.39 (44.6–64.2)	.001

BMI = body mass index; MDI = Major Depression Inventory; SF-12 = Short-Form Health Survey.

in poorer mental health because of their sexual dysfunction or whether the sexual dysfunction is a consequence of the poor mental health cannot be known with the design of this study. The literature described both directions concerning this association [2,3,19–21], and the reality may be a combination of these two possible explanations: on the one side, the sexual dysfunction may be the cause of a slight depression, and on the other side, severely depressed young men may experience sexual dysfunction as a side effect of their mental trouble. Whatever direction this association takes, practitioners should be aware of the link between sexual dysfunction and mental status in this age-group.

Considering the remaining direct associations, our results show that PE is linked with four other variables. The first one is tobacco use, with occasional users most frequently encountered in the PE group than in the non-PE group. The association between tobacco and sexual dysfunction has been well described as part of a health-compromising lifestyle [8]. The fact that daily users report less PE than occasional users suggests a more complex link. A possible explanation would be that occasional users are anxious personalities and that they smoke from time to time to relax and perhaps decrease their propensity for PE.

Second, the use of illegal drugs other than cannabis is directly associated with PE. This may be explained by the fact that alcohol and cannabis are among the most frequently used substances, which makes the use of other illegal drugs a more discriminatory one (Figure 1). Considering the persistent association existing between the use of illegal drugs other than cannabis and frequently used substances, such as tobacco, cannabis, or alcohol, we can assume that young men reporting illegal drug use are probably farther in their consumption pathway and are also taking these most frequently used substances. Even if these substances are not directly associated with PE, the link exists through illegal drug use. This interpretation underlines the importance of overall substance use regarding PE. Health professionals should keep this association with substance use in mind if sexual topics such as PE should be addressed.

The third direct association occurring with PE is physical activity. Unhealthy lifestyle is reported to include, among others, low physical activity and has already been described to be associated with PE [8]. Erectile function of men with unhealthy lifestyle risk factors has been described to improve with nonpharmacological interventions aiming at weight loss and increasing physical activity[35]. Similarly, promoting a healthy lifestyle could be considered a first-line treatment easy to implement for PE.

The last direct link with PE appears to be professional activity. Students report PE almost twice more frequently than working young men. Knowing that the International Physical Activity

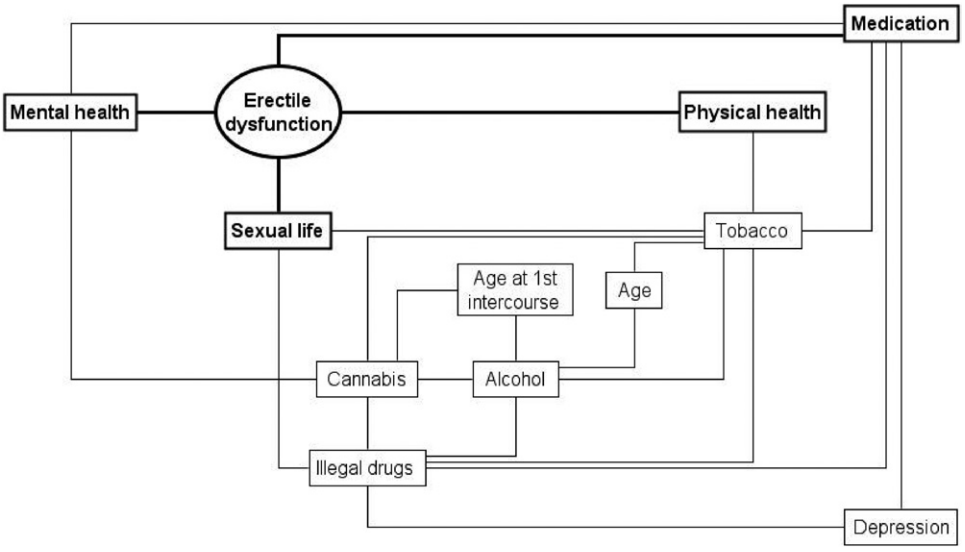

Figure 2. Factors directly or indirectly associated with erectile dysfunction (ED) in the log-linear model. Direct links with ED appear in bold. For the purpose of clarity, possible direct associations between confounding variables age, mental health, physical health, depression, sexual life, and age at first intercourse are not shown. Direct associations with ED are represented in bold.

Questionnaire score used in the present study takes into account physical activities such as carrying heavy things, we are not surprised to see that working young men report more physical activity than students. In fact, physical activity appears to be related to professional activity in the PE log-linear model (results not shown in Figure 1 for purpose of clarity), which can explain the association between professional activity and PE.

Three direct associations are finally seen with ED. First, medication without a prescription appears to be more frequent among the ED group. ED is known to be a potential adverse effect of many medications [36]. The use of medication may be a step in young men's consumption pathway, and then be a part of the overall substance use association described previously. But because these young men report taking medication without a prescription, we could also hypothesize that they try it as self-treatment to improve their sexual dysfunction [30]. This may suggest a lack of communication concerning sexual activity between young men and their practitioner [26]. If neither young men nor health professionals take an initiative to address sexual topics during consultation, the young men may look for solutions by themselves, which may be health compromising.

Second, almost half of young men in the ED group report a sexual life of <2 years compared with only 30% in the non-ED group. As expected, experience seems then to have an important impact on ED in this age category.

Third, physical health appears to be directly associated with ED. As ED has been associated with chronic physical conditions [15,16], this finding may reflect that even at this young age chronic conditions can affect young men's sexual life.

Finally, contrary to previously published studies among a general male population [17,18], neither PE nor ED was linked with BMI in our sample of young men. This may be related to the absence of obesity-associated vascular lesions at this young age.

The strengths of this study are the large sample size and the fact that every young man in Switzerland has to go through this recruitment convocation, implying that even those usually dropping out from this kind of study are involved as participants, which brings a reliable validity. However, this study has some limitations. First, we cannot assess causality because of the cross-sectional design. Second, young men were enrolled on a voluntary participation basis, and data on height and weight were self-reported, both of which can bias the results. Third, unfortunately our data did not include anxiety or the quality or nature of the men's relationships, and it could be hypothesized that such variables could have better explained our results. Finally, the overall response rate is relatively low (40%).

In conclusion, our study is the first to estimate the prevalence of sexual dysfunction among young men in Switzerland. It highlights that one young man out of three suffers from one of the two most frequent types of sexual dysfunction, which makes it much more common than we expected. It corresponds to what has been found in the United States and in some European countries. Even if the dysfunction is not necessarily severe, it needs to be considered carefully by health care professionals. Additionally, associated factors such as mental troubles, physical inactivity, or substance use should then act as red flags to encourage practitioners to talk about sexuality with their young male patients. Young men have reported barriers, such as embarrassment or confidentiality issues, that prevent them from attending medical consultations for sexual dysfunctions [25,37]. In addition, it has been suggested that young patients will not talk spontaneously about sexual topics but would appreciate their practitioner to mention such subjects during consultation [25,38]. Health care professionals should be aware that young men will not talk spontaneously about sexual topics even if they have such troubles and that they expect their general practitioner to address sexuality during consultations. Because of the high prevalence of sexual dysfunction in this age-group and the potentially deleterious consequences associated with it, health professionals should take any opportunity to talk about sexuality with their young male patients.

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