

1 **FAR FROM ACCEPTABLE: YOUTH-REPORTED RISK BEHAVIOR SCREENING BY PRIMARY CARE**  
2 **PHYSICIANS**

3 Taslina EISNER-FELLAY

4 Christina AKRE

5 Diane AUDERSET

6 Yara BARRENSE-DIAS

7 Joan-Carles SURIS

8 Research Group on Adolescent Health, Department of Epidemiology and Health Services,  
9 Center for Primary Care and Public Health (Unisanté), University of Lausanne, Switzerland

10 Article category: Original Research

11

12 Short title: Risk behavior screening by primary care physicians

13

14 Corresponding author: Prof. JC Surís  
15 GRSA/ DESS / Unisanté  
16 Route de la Corniche 10  
17 1010 Lausanne / Switzerland  
18 Joan-carles.suris@unisante.ch

19 Word count: 2989

20

21 **Key messages**

- 22 ● Screening in youths reporting taking part in risk behaviours (RB) was low
- 23 ● Physicians rarely address RB related topics with youths, despite their wishes
- 24 ● Males report decreased odds of addressing emotional issues with a physician
- 25 ● Despite the low screening rates, when RB are addressed, the screening is thorough
- 26 ● Training physicians in RB screening and counselling is of utmost importance

27

28 **Abstract**

29 *Background*

30 Adolescence and early adulthood are periods of experimentation during which health  
31 detrimental behaviours might be acquired.

32 *Objective*

33 This study's purpose is to evaluate physicians' likelihood of addressing health risk behaviours  
34 with youths depending on the youths' wishes, risk behaviours, and personal characteristics.

35 *Methods*

36 Data were drawn from the third wave (2017-18) of the GenerationFree longitudinal study  
37 carried out on a sample of 1970 youths aged 17-26 in Switzerland. Analysed risk behaviours  
38 were: eating disorders, substance use, emotional wellbeing, problematic internet use and  
39 gambling. Bivariate and multivariate analysis were performed, results are presented as  
40 adjusted odd ratios (aOR).

41 *Results*

42 Physicians discussed most risk behaviours with less than half of the youths. The odds of  
43 addressing risk behaviours were seldom raised when the risk behaviour was present, or  
44 when the youth wished to discuss it. Emotional wellbeing was addressed with half as many  
45 males as females (aOR 0.47), and drugs were found to be addressed more frequently with  
46 youths reporting a low family socio-economic status (aOR 6.18). When a risk behaviour is  
47 addressed it is mostly alongside an extended screening

48 *Conclusion*

49 This study confirmed the low levels of health risk behaviours screening, regardless of the  
50 youths' wish to discuss the topic with their physician. Despite the low levels, physicians do  
51 tend to screen systematically, especially when discussing substance use. There is a need to  
52 improve physicians training in risk behaviour screening and counselling in order to increase  
53 this practice.

54 *Keywords*

55 Adolescents; Young adults; Primary care screening; Risk behaviours; Physician training;  
56 Prevention

57

## 58 **Introduction**

59           Adolescence and young adulthood (AYA) (1, 2) is a period of physical, cognitive, social  
60 and emotional changes. AYA is also a period when navigating the line between experimenting  
61 and acquiring health-detrimental behaviours can be challenging. Knowing that the major  
62 cause of adolescent mortality and morbidity is risk behaviour related and hence preventable,  
63 this stage can be seen as a unique opportunity to reduce morbi-mortality through promoting  
64 healthy behaviours, affecting not only the concerned individuals, but future generations as  
65 well. (3)

66           Since AYA is a period of significant health importance, it is essential to detect the  
67 individuals who are acquiring behavioural patterns that might affect their future health. (4, 5)  
68 To attain such a goal, and following the American Medical Association's guidelines for  
69 adolescent preventive services (GAPS) (3), countries such as the United States and Australia  
70 (6, 7) have implemented recommendations. These focus mainly on adolescents and  
71 recommend that primary care physicians screen their patients from this age group during their  
72 visits. If screening reveals a concern, it should be followed by an appropriate intervention. (4)  
73 One of the many risk behaviour screening methods that exists among youths is an acronym  
74 created by Goldenring and Cohen in 1988 and updated last in 2014 by Klein et al.: the  
75 HEEADSSS (Home-Education-Eating-Activity-Drugs-Sex-Safety-Suicide) method. (4, 8). This  
76 screening method is widely used in Switzerland.

77 Despite the available guidelines and tools, screening levels are still lower than what is  
78 recommended. (9, 10) For youths who have access to primary health care, this lack of  
79 screening has been attributed to different factors, foremost the time needed to correctly  
80 execute it, the insufficient training on how to manage an efficient screening in a short window  
81 of time. (4, 11)

82           The fact that physicians are unable to follow the screening guidelines raises an  
83 important question: do they address selective risk behaviours based on patient characteristics,  
84 allowing for disparities in covered topics or do they screen thoroughly? The pertinence of this  
85 question is supported by a study carried out by Adams et al., which demonstrates that  
86 physicians address certain topics with certain youths depending on characteristics such as age,  
87 gender, race or family income. (12) However, the influence of patient characteristics on risk  
88 behaviour screening has been rarely addressed in countries with a compulsory health  
89 coverage, such as Switzerland, which presents fewer disparities concerning young adults'  
90 access to health access. (1)

91           Therefore, this study sets out to, firstly, determine the likelihood of a physician  
92 addressing risk behaviours depending on whether youths wish to address the topic and have  
93 adopted a particular risk behaviour. Secondly, we aimed to determine whether individual  
94 patient characteristics and sociodemographic variables influence the likelihood of the  
95 physician to address certain topics.

## 96 **Methodology**

97           The data were drawn from the third wave of the GenerationFRee longitudinal study  
98 carried out from 2014 to 2019. This study's aim was to examine the lifestyle of youths aged  
99 15-24 at baseline (mean age of 18 years in the third wave) attending the eleven post-  
100 mandatory schools (five high- and six vocational schools) in the canton of Fribourg,  
101 Switzerland. Post-mandatory schools gather about one third of students who chose a high-  
102 school path (that usually leads to university studies), and two-thirds who chose a vocational  
103 path (apprentices in a professional training). This research was included in the study's third  
104 wave which was carried out in the 2017-2018 academic year. A web-based questionnaire was  
105 anonymously self-administered during class to 2419 youths attending 3<sup>rd</sup> year (response rate:

106 81.7%). Among them, 193 (8%) did not wish to participate, 45 were duplicates, 128 were not  
107 reliably completed, 67 were not in the age range, and 16 reported not being in school anymore  
108 (those in a two year vocational path were contacted by email). Therefore, the base sample  
109 used in this study included 1970 youths. Data were weighted according to known  
110 characteristics of the population under study: age, gender, academic track (student or  
111 apprentice) and language (French or German). The study was approved by the Ethics  
112 committee of the canton of Vaud.

### 113 *Variables*

114 For the purpose of this study, only youths who had visited a physician at least once in  
115 the past two years were included (N=1269; 67%). The physicians comprised general  
116 practitioners (GP) (for 82% of youths), paediatricians (2%) and specialists (6%), with 10% of  
117 respondents not indicating who their provider was. Visits to an emergency service were not  
118 included in this study. There were no significant differences between those who had visited a  
119 physician in the past two years and those who had not regarding age and academic track.  
120 However, there was a significant gender difference, with a majority of youths who had not  
121 visited a physician in the past two years being males (62% of youths). The demographic  
122 characteristics of the sample can be found in Table 1.

123 The risk behaviours analysed were eating disorders, alcohol misuse, tobacco smoking,  
124 marijuana use, use of other illegal drugs, poor emotional wellbeing, internet addiction and  
125 problematic gambling. These were chosen since they are included in the HEEADSSS screening  
126 method, which is the primary screening method recommended in Switzerland. Problematic  
127 gambling was present in the original study from which data were drawn and we included it as  
128 an activity of young people. Although this is a problematic rarely addressed through screening,  
129 it has been shown to be linked to problematic Internet use and substance misuse.(14)

130 Each risk behaviour was first divided into two categories: youths whose physician had  
131 addressed the topic at least once in the past two years, whether sufficiently or insufficiently  
132 according to them; and those whose physician had not addressed it. The categories of  
133 sufficiently or insufficiently addressed were analysed as one, since there were no significant  
134 differences between them when analysed separately, and the number of participants in the  
135 insufficiently discussed group was small. One of the answer options for all questions regarding  
136 whether the physician had addressed a topic, was “I don’t know/don’t remember”. Those  
137 answers (ranging from 7.2% for eating disorders to 8.9% for emotional wellbeing) were  
138 excluded from the analysis. The total number of answers included for each risk behaviour is  
139 indicated in table 2.

140 Risk behaviours were also classified into two supplementary categories: youths who  
141 reported a risk behaviour and those who did not. Eating disorders were analysed using the  
142 five question SCOFF screening tool, and youths were accordingly determined to be at risk if  
143 they answered yes to two or more questions. (15) Substance use included alcohol misuse (at  
144 least one episode of drunkenness during the last month), current tobacco smoking status  
145 (yes/no), and marijuana or other illegal drug use (at least once in the past month). Internet  
146 addiction was determined using the short version of the internet addiction test (IAT), with a  
147 score above 30 (range of 0-60) being considered at-risk. (16) Problematic gambling was  
148 determined using the South Oaks Gambling Screen revised for adolescents (SOGS-RA), with  
149 two or more positive answers being determined as at-risk. (17) Emotional well-being was  
150 assessed using the World Health Organization 5 (WHO5) index, which evaluates emotional  
151 well-being over the past two weeks through 5 questions, and a score below 13 (range 0 to 25)  
152 was considered as poor emotional well-being. (18)

153           The following independent variables were included: age and gender; perceived family  
154 socio-economic status (SES) (dichotomised into below average and average or higher,  
155 depending on the youths assessment of their family's SES compared to other families in  
156 Switzerland, following the European school survey project on alcohol and other drugs (ESPAD)  
157 methodology) (19); parent's situation (together or other); place of residence (rural or urban);  
158 academic track (apprentice or student) and their health perception (dichotomised into good  
159 [good/very good/excellent] and poor [fair/poor]). Additional independent variables were the  
160 youth's wish to address the topic with their physician and the thoroughness of the physician's  
161 screening which we named physician's screening. Physician's screening is a continuous  
162 variable, established through the mean of topics a physician addressed with a youth. It  
163 allowed us to determine that a majority of physicians addressed less than two risk behaviours,  
164 with 30% addressing none, and less than 20% addressing more than four. Entering this variable  
165 into a bivariate and multivariate analysis allowed us to determine whether when a risk  
166 behaviour was addressed, it was alongside a vast screening of risk behaviours, or whether it  
167 was a selective screening.

168           Data were analysed using Stata 14 (StataCorp, college station, Texas), first through a  
169 bivariate analysis, providing the mean and point prevalence of each category, using the Chi-  
170 square test for categorical variables, and student's t for continuous ones. Statistically  
171 significant variables ( $p < 0.05$ ) were then entered into a separate logistic regression for each  
172 addressed risk behaviour, using "topic non addressed" as the reference category. Data are  
173 presented as adjusted odds ratios (aOR).



174 **Results**

175 Our study revealed low screening rates, ranging from 6% for problematic gambling to  
176 53% for eating disorders. Most topics had been addressed with less than half of the youths  
177 (Table 2).

178 The bivariate analysis (Table 2) showed that the majority of topics had a significantly  
179 higher chance of being addressed by physicians when the youth reported wanting to discuss  
180 it. However, when the corresponding risk behaviour was present, only few (marijuana use,  
181 tobacco smoking, internet addiction) were found to have a higher tendency of being  
182 discussed. Male gender was associated to higher chances of addressing most substance use  
183 topics, whereas females were related with emotional wellbeing and eating disorders, even if  
184 the later did not reach significance. Low family socio-economic status also raised the tendency  
185 of addressing substance use. The variable related to physician's screening was found to be  
186 significantly correlated to all eight topics, with eating disorders being addressed through  
187 seemingly selective screening (3 other topics addressed), and substance use through broader  
188 screenings (mean of 5.4 other topics addressed).

189 The multivariate analysis (Table 3) confirmed that only the odds of addressing eating disorders  
190 (aOR 1.82), tobacco (aOR 4.61) or marijuana (aOR 6.91) increased when the youth reported  
191 wishing to address the topic, or through the presence of the risk behaviour (aOR for tobacco:  
192 4.40; aOR for marijuana: 5.41). The odds of addressing alcohol misuse were also raised (aOR  
193 1.91), however only by the presence of the risk behaviour itself, and not by the youth's wish  
194 to discuss it. Emotional wellbeing was addressed with half as many males as females (aOR  
195 0.47). Drugs were found to be addressed more frequently with youths who reported a low  
196 family socio-economic status (aOR 6.18). Through the variable physician's screening, we were  
197 able to determine that despite the low screening rates, when a risk behaviour was addressed,

198 it was mostly addressed alongside an extended screening with aORs ranging from 2.27 for  
199 Internet addiction to 12.06 for problematic gambling. In the event of substance use being  
200 addressed, physicians were around 7 times more likely to have addressed other risk  
201 behaviours.

## 202 **Discussion**

203 Previous studies have put forward that adolescents from countries with compulsory  
204 health insurance such as Switzerland do not meet difficulties accessing the health care system.  
205 (9, 20, 21) This study confirms those results, since 67% of the youths reported having visited  
206 a physician in the past two years, most of them a general practitioner. However, among those  
207 who had not consulted recently, 62% were males. This has been addressed in previous  
208 research, and stresses the importance of being particularly attentive to male patients, since  
209 they are seen less regularly than females, even when taking into account gynaecological visits.  
210 (22, 23)

211 Our study confirms that the screening levels of youths who have visited a health  
212 professional in the past two years are low since within most cases physicians appear to  
213 address risk behaviours with less than half of their young patients. The screening levels stay  
214 low for most risk behaviours even when youths report wanting to discuss them with their  
215 physician. Previous studies have shown similar results, with youths wishing to receive  
216 counselling from their physician, but providers failing to address those topics. (4, 24) An  
217 explanation could be that although youths would like to address risk related topics with their  
218 provider, they mainly seek medical help for physical issues (25), and do not seem to bring  
219 those topics up on their own therefore highlighting the importance of physicians being  
220 proactive about screening.

221 Screening in youths who reported taking part in risk behaviours was found to be  
222 equally low, apart for alcohol, tobacco, and marijuana. These were found to have raised odds  
223 of being addressed when the youth reported taking part in the risk behaviour. Adolescence  
224 being a period of experimentation, determining which youths are safely maturing, and which  
225 ones are at risk can be difficult. Regarding smoking, experimental cigarette use raises the risk  
226 of daily smoking two years later, and therefore needs to be addressed early. (26) Although  
227 alcohol misuse raises the odds of addressing alcohol with a physician, the proportion of youths  
228 in this study having addressed this topic with their provider is alarmingly low (24% of youths).  
229 Even more so knowing the dangerous impact that alcohol abuse can have on a youth's health,  
230 and its important correlation with other risk behaviours. (27-29) Moreover, knowing that  
231 youths are favourable to address alcohol related topics with their physician (29), it does not  
232 appear sufficient to influence the odds of actually addressing it. This emphasises the  
233 importance of physician training regarding alcohol abuse in youths.

234 The aim of this study was to determine whether physicians tended to do selective  
235 screening based on patients' individual characteristics or whether they did broad screening.  
236 The variable named physicians screening, allows us to postulate that despite the overall low  
237 screening rates, when physicians do address risk behaviours, they do so through a thorough  
238 screening. Nevertheless, there are risk behaviours (such as substance use) that are much more  
239 often addressed than others (such as emotional wellbeing or eating disorders), and these  
240 differences may reflect to what extent some physicians feel at ease in discussing different  
241 issues. However, even though several barriers to screening have been put forward such as lack  
242 of time, lack of training or lack of further treatment options (30), the exact characteristics that  
243 differentiate physicians who screen thoroughly from the other providers are not yet fully  
244 understood. As previously stated, it is essential for physicians to do proactive screening

245 therefore allowing an opening of the discussion. This falls under the guidelines for youth  
246 friendly services. (24, 31-33) Moreover, it has been shown that youths have a more positive  
247 image of providers who discuss sensitive topics, allowing for a strengthened patient-provider  
248 relationship, and the opening up of hidden agendas. (34)

249 Emotional wellbeing was overall reported to have been seldom addressed and was  
250 found to be less included in broad screenings. More alarming is the seeming lack of detection  
251 in youths who report low emotional wellbeing. This corroborates results found by Mauerhofer  
252 et al., which showed that although a majority of youths had visited a physician in the previous  
253 year, only a minority of them had addressed mental wellbeing (5), stressing the importance of  
254 physicians screening youths systematically since it increases detection rates. (35) Males were  
255 found to have decreased odds of addressing emotional issues with a primary care physician  
256 compared to females. This result confirms previous studies (36-38), which showed that young  
257 males have a lower tendency to seek help when in psychological distress. This can be partly  
258 attributed to their avoidance of recognition of their own issues (36, 37), and partly to  
259 physicians who address these topics less systematically. Since young males have higher rates  
260 of suicide attempts when compared with young females (39), it is essential for primary care  
261 physicians to screen systematically and independently from gender. Moreover, it has been  
262 stated that 57% of men seeking professional help regarding mental health issues were  
263 influenced by their general practitioner (36), stressing the important role GPs can play.

264 Youths from families with a below average socio-economic status (SES) had a sixfold  
265 increase in the odds of having addressed drug use with a physician. This could be linked to  
266 previous research showing that youths from lower SES backgrounds show an increased  
267 probability of substance use. (40) However, since higher parental income has been shown to  
268 be associated to higher rates of binge drinking and marijuana use (41), it is essential to screen

269 patients from all SES backgrounds. In a country with compulsory health insurance, in which  
270 part of the health bill is paid by the patient, patients from lower SES backgrounds could be less  
271 inclined to visit a physician unless in case of an emergency. This stresses the importance of  
272 taking advantage of all types of visits to perform preventive care, since they might be the only  
273 contact between the youth and the health care system.

274 This study's strengths were the large school-based sample, as well as the  
275 exhaustiveness of topics covered through the questionnaire. Nevertheless, some limitations  
276 need to be mentioned. First, the cross-sectional aspect of the study does not allow for causal  
277 relations. Second, a possible recall bias cannot be ruled out as questions covered the last two-  
278 years. Third, our sample did not include youths outside the educational system, which may be  
279 more at risk. Finally, we did not control for a number of visits. However, in a country with  
280 compulsory health coverage, with no disparities regarding access to primary health care, this  
281 limitation is likely to only have a small impact. Moreover, about 80% of adolescent females  
282 and 75% of adolescent males in Switzerland see their primary care provider at least once a  
283 year (21).

## 284 **Conclusions**

285 Our findings confirmed the low levels of health risk behaviours screening, regardless  
286 of the youths wish to discuss the topic with their physician. Despite these low levels, when  
287 physicians screen for risk behaviours, they do so thoroughly, especially when discussing  
288 substance use. However, emotional wellbeing is seldom addressed, especially with male  
289 patients. This stresses the importance of further training physicians in risk behaviour screening  
290 and counselling. Moreover, since youths risk behaviours may change rapidly, it is essential to  
291 use each medical encounter to re-evaluate them, independently of age, gender or  
292 socioeconomic status.

293 **Declarations/Acknowledgements**

- 294
- The study was approved by the Ethics committee of the canton of Vaud, Switzerland.
- 295
- The authors have no conflict of interest to declare.
- 296
- The GenerationFree study was financed by the *Programme intercantonal de lutte*
- 297 *contre la dépendance au jeu (PILDJ)* and the canton of Fribourg.
- 298

299 **References**

- 300 1. Sawyer SM, Azzopardi PS, Wickremarathne D, Patton GC. The age of adolescence. The  
301 Lancet Child & Adolescent Health. 2018;2(3):223-8.
- 302 2. Organization WHO. The second decade: improving adolescent health and  
303 development2001. Available from:  
304 [https://apps.who.int/iris/bitstream/handle/10665/64320/WHO\\_FRH\\_ADH\\_98.18\\_Rev.1.pdf](https://apps.who.int/iris/bitstream/handle/10665/64320/WHO_FRH_ADH_98.18_Rev.1.pdf?sequence=1)  
305 [?sequence=1](https://apps.who.int/iris/bitstream/handle/10665/64320/WHO_FRH_ADH_98.18_Rev.1.pdf?sequence=1).
- 306 3. Elster A, Kuznets N. Guidelines for adolescent preventive services. Baltimore: Williams  
307 and Wilkins. 1994.
- 308 4. Rutishauser C. Communicating with young people. Paediatric Respiratory Reviews.  
309 2003;4(4):319-24.
- 310 5. Mauerhofer A, Berchtold A, Michaud P-A, Suris J-C. GPs' role in the detection of  
311 psychological problems of young people: a population-based study. The British Journal of  
312 General Practice: The Journal of the Royal College of General Practitioners.  
313 2009;59(566):e308-14.
- 314 6. Chown P, Kang M. Adolescent Health: Enhancing the Skills of General Practitioners in  
315 Caring for Young People from Culturally Diverse Backgrounds; a Resource Kit for GPs:  
316 Transcultural Mental Health Centre and NSW Centre for the Advancement of Adolescent  
317 Health; 2004.
- 318 7. Hagan JF, Shaw JS, Duncan PM. Bright futures: Guidelines for health supervision of  
319 infants, children, and adolescents 2007. Available from:  
320 [https://brightfutures.aap.org/Bright%20Futures%20Documents/BF4\\_Introduction.pdf](https://brightfutures.aap.org/Bright%20Futures%20Documents/BF4_Introduction.pdf).
- 321 8. Klein DA, Goldenring JM, Adelman WP. HEADSSS 3.0: the psychosocial interview for  
322 adolescents updated for a new century fueled by media. 2014;Contemp Pediatr 2014:1-16.
- 323 9. Harris SK, Herr-Zaya K, Weinstein Z, Whelton K, Perfas F, Castro-Donlan C, et al. Results  
324 of a statewide survey of adolescent substance use screening rates and practices in primary  
325 care. Substance Abuse. 2012;33(4):321-6.
- 326 10. Boisen KA, Hertz PG, Blix C, Teilmann G. Is HEADS in our heads? Health risk behavior is  
327 not routinely discussed with young people with chronic conditions. International Journal of  
328 Adolescent Medicine and Health. 2015;28(4):429-35.
- 329 11. Monico LB, Mitchell SG, Dusek K, Gryczynski J, Schwartz RP, Oros M, et al. A  
330 Comparison of Screening Practices for Adolescents in Primary Care After Implementation of  
331 Screening, Brief Intervention, and Referral to Treatment. Journal of Adolescent Health.  
332 2019;65(1):46-50.
- 333 12. Adams SH, Husting S, Zahnd E, Ozer EM. Adolescent preventive services: rates and  
334 disparities in preventive health topics covered during routine medical care in a California  
335 sample. The Journal of Adolescent Health: Official Publication of the Society for Adolescent  
336 Medicine. 2009;44(6):536-45.
- 337 13. Haller DM, Michaud PA, Suris JC, Jeannin A, Narring F. Opportunities for prevention in  
338 primary care in a country with universal insurance coverage. J Adolesc Health. 2008;43(5):517-  
339 9.

- 340 14. Tozzi L, Akre C, Fleury-Schubert A, Suris JC. Gambling among youths in Switzerland and  
341 its association with other addictive behaviours. A population-based study. *Swiss Med Wkly.*  
342 2013;143:w13768.
- 343 15. Morgan JF, Reid F, Lacey JH. The SCOFF questionnaire. *Western Journal of Medicine.*  
344 2000;172(3):164-5.
- 345 16. Pawlikowski M, Altstötter-Gleich C, Brand M. Validation and psychometric properties  
346 of a short version of Young's Internet Addiction Test. *Computers in Human Behavior.*  
347 2013;29(3):1212-23.
- 348 17. Boudreau B, Poulin C. The South Oaks Gambling Screen-revised Adolescent (SOGS-RA)  
349 Revisited: A Cut-point Analysis. *Journal of Gambling Studies.* 2007;23(3):299-308.
- 350 18. Topp CW, Østergaard SD, Søndergaard S, Bech P. The WHO-5 Well-Being Index: A  
351 Systematic Review of the Literature. *Psychotherapy and Psychosomatics.* 2015;84(3):167-76.
- 352 19. Muscat RR, Gertrude. European School Survey Project on Alcohol and Other Drugs.  
353 1999.
- 354 20. Chamay Weber C, Haller DM, Narring F. Is there a role for primary care physicians'  
355 screening of excessive weight and eating concerns in adolescence? *The Journal of Pediatrics.*  
356 2010;157(1):32-5.
- 357 21. Jeannin A, Narring F, Tschumper A, Bonivento LI, Addor V, Butikofer A, et al. Self-  
358 reported health needs and use of primary health care services by adolescents enrolled in post-  
359 mandatory schools or vocational training programmes in Switzerland. *Swiss Med Wkly.*  
360 2005;135(1-2):11-8.
- 361 22. Fortuna RJ, Robbins BW, Halterman JS. Ambulatory care among young adults in the  
362 United States. *Annals of internal medicine.* 2009;151(6):379-85.
- 363 23. Marcell AV, Klein JD, Fischer I, Allan MJ, Kokotailo PK. Male adolescent use of health  
364 care services: where are the boys?. *Journal of Adolescent Health.* 2002;30(1), 35-43.
- 365 24. Klein JD, Wilson KM. Delivering quality care: adolescents' discussion of health risks  
366 with their providers. *Journal of Adolescent Health.* 2002;30(3):190-5.
- 367 25. Marcell AV, Halpern-Felsher BL. Adolescents' health beliefs are critical in their  
368 intentions to seek physician care. *Preventive Medicine.* 2005;41(1):118-25.
- 369 26. Sargent JD, Gabrielli J, Budney A, Soneji S, Wills TA. Adolescent smoking  
370 experimentation as a predictor of daily cigarette smoking. . *Drug and alcohol dependence.*  
371 2017;175, 55-59.
- 372 27. Grigsby TJ, Forster M, Unger JB, Sussman S. Predictors of alcohol-related negative  
373 consequences in adolescents: A systematic review of the literature and implications for future  
374 research. *Journal of Adolescence.* 2016;48:18-35.
- 375 28. Mokdad AH, Forouzanfar MH, Daoud F, Mokdad AA, El Bcheraoui C, Moradi-Lakeh M,  
376 et al. Global burden of diseases, injuries, and risk factors for young people's health during  
377 1990-2013: a systematic analysis for the Global Burden of Disease Study 2013. *Lancet (London,*  
378 *England).* 2016;387(10036):2383-401.



- 379 29. Heikkinen N, Niskanen E, Könönen M, Tolmunen T, Kekkonen V, Kivimäki P, et al.  
380 Alcohol consumption during adolescence is associated with reduced grey matter volumes.  
381 *Addiction*. 2017;112(4):604-13.
- 382 30. Van Hook S, Harris SK, Brooks T, Carey P, Kossack R, Kulig J, et al. The “Six T’s”: Barriers  
383 to Screening Teens for Substance Abuse in Primary Care. *Journal of Adolescent Health*.  
384 2007;40(5):456-61.
- 385 31. Webb MJ, Kauer SD, Ozer EM, Haller DM, Sanci LA. Does screening for and intervening  
386 with multiple health compromising behaviours and mental health disorders amongst young  
387 people attending primary care improve health outcomes? A systematic review. *BMC family*  
388 *practice*. 2016;17:104.
- 389 32. Tylee A, Haller DM, Graham T, Churchill R, Sanci LA. Youth-friendly primary-care  
390 services: how are we doing and what more needs to be done? *Lancet (London, England)*.  
391 2007;369(9572):1565-73.
- 392 33. Payne D, Martin C, Viner R, Skinner R. Adolescent medicine in paediatric practice.  
393 *Archives of Disease in Childhood*. 2005;90(11):1133-7.
- 394 34. Brown JD, Wissow LS. Discussion of Sensitive Health Topics with Youth During Primary  
395 Care Visits: Relationship to Youth Perceptions of Care. *Journal of Adolescent Health*.  
396 2009;44(1):48-54.
- 397 35. Ambresin A-E, Otjes CP, Patton GC, Sawyer SM, Thuraisingam S, English DR, et al.  
398 Training General Practitioners to Detect Probable Mental Disorders in Young People During  
399 Health Risk Screening. *The Journal of Adolescent Health: Official Publication of the Society for*  
400 *Adolescent Medicine*. 2017;61(3):302-9.
- 401 36. Rickwood D, Deane FP, Wilson CJ, Ciarrochi J. Young people’s help-seeking for mental  
402 health problems. *Australian e-Journal for the Advancement of Mental Health*. 2005;4(3):218-  
403 51.
- 404 37. Leong FTL, Zachar P. Gender and opinions about mental illness as predictors of  
405 attitudes toward seeking professional psychological help. *British Journal of Guidance &*  
406 *Counselling*. 1999;27(1):123-32.
- 407 38. Mackenzie CS, Gekoski W, Knox V. Age, gender, and the underutilization of mental  
408 health services: the influence of help-seeking attitudes. *Aging and mental health*.  
409 2006;10(6):574-82.
- 410 39. Park MJ, Scott JT, Adams SH, Brindis CD, Irwin CE. Adolescent and young adult health  
411 in the United States in the past decade: little improvement and young adults remain worse off  
412 than adolescents. *The Journal of Adolescent Health: Official Publication of the Society for*  
413 *Adolescent Medicine*. 2014;55(1):3-16.
- 414 40. Reinherz HZ, Giaconia RM, Hauf AMC, Wasserman MS, Paradis AD. General and  
415 Specific Childhood Risk Factors for Depression and Drug Disorders by Early Adulthood. *Journal*  
416 *of the American Academy of Child & Adolescent Psychiatry*. 2000;39(2):223-31.
- 417 41. Humensky JL. Are adolescents with high socioeconomic status more likely to engage in  
418 alcohol and illicit drug use in early adulthood? *Substance Abuse Treatment, Prevention, and*  
419 *Policy*. 2010;5(1):19.
- 420

421 *Table 1: Demographic table of youths attending 3<sup>rd</sup> year post-mandatory education in Fribourg,*  
 422 *Switzerland, having visited a physician in the past two years (n=1269)*

<i>Characteristics</i>	<i>% Total</i>	<i>Females (n)</i>	<i>Males (n)</i>
<i>Gender, female</i>	51.53	658	618
<i>Age, mean, years</i>	18.73 (SD 0.08)	18.76	18.61
<i>Academic track, apprentice</i>	62.16	458	766
<i>Residence, rural area</i>	64.48	596	672
<i>Low socio-economic status</i>	9.70	89	101
<i>Parental situation (together)</i>	68.02	609	728
<i>Health (poor)</i>	3.77	42.33	30.54

423

424

Table 2: Result of bivariate analysis according to whether the risk behaviour was addressed, in 1269 youths (17-26 years) in Fribourg, Switzerland

Risk behaviour:	Eating disorders N = 1228		Internet addiction N=1205		Alcohol misuse N=1221		Tobacco smoking N=1214		Marijuana use N=1219		Drug use N=1217		Emotional wellbeing N=1204		Problematic gambling N=1216	
	Yes (53%)	No (47%)	Yes (18%)	No (82%)	Yes (24%)	No (76%)	Yes (30%)	No (70%)	Yes (15%)	No (85%)	Yes (12%)	No (88%)	Yes (45%)	No (55%)	Yes (6%)	No (94%)
Risk behaviour (present) (%)	25.13	20.74	<b>7.87</b> *	<b>3.94</b> *	52.06	45.80	<b>53.78</b> ***	<b>32.44</b> ***	<b>35.48</b> **	<b>21.06</b> *	4.23	2.25	28.74	23.78	13.14	6.59
Wish to address the item (yes) (%)	<b>66.03</b> ***	<b>46.59</b> ***	<b>25.71</b> **	<b>14.58</b> **	<b>50.09</b> ***	<b>29.44</b> ***	<b>51.09</b> ***	<b>25.15</b> ***	<b>47.98</b> ***	<b>21.34</b> ***	<b>47.51</b> ***	<b>20.49</b> ***	<b>49.56</b> ***	<b>16.46</b> ***	3.27	5.29
Mean age (Years±SD)	18.69 ±0.006	18.69 ±0.006	<b>19.51</b> <b>±0.10</b> *	<b>18.74</b> <b>±0.05</b> *	18.7 ±0.09	18.68 ±0.05	<b>18.99</b> <b>±0.09</b> ***	<b>18.57</b> <b>±0.05</b> ***	18.7 ±0.7	18.69 ±0.46	18.76 ±0.14	18.68 ±0.05	18.76 ±0.07	18.65 ±0.06	18.77 ±0.21	18.69 ±0.04
Gender (Male) (%)	47.62	49.40	<b>66.56</b> ***	<b>44.8</b> ***	<b>56.28</b> *	<b>46.13</b> *	49.21	48.34	<b>61.64</b> **	<b>46.52</b> **	<b>61.2</b> *	<b>46.88</b> *	<b>42.88</b> *	<b>52.54</b> *	64.79	47.28
Family SES (below average) (%)	10.45	9.54	10.21	9.99	<b>15.79</b> **	<b>8.2</b> **	<b>15.89</b> ***	<b>7.69</b> ***	<b>19.39</b> ***	<b>8.34</b> ***	<b>20.29</b> ***	<b>8.52</b> ***	<b>12.79</b> *	<b>8.32</b> *	<b>19.32</b> *	<b>9.27</b> *
Parents (not together) (%)	32.17	34.10	29.86	33.65	31.84	33.16	36.22	31.51	30.80	33.34	28.88	33.40	34.99	31.33	23.75	33.17
Residence (rural) (%)	60.70	64.52	62.23	62.27	63.85	62.37	62.47	62.10	58.82	63.33	62.66	62.51	62.35	61.80	56.62	62.88
Academic Track (apprentice) (%)	61.94	61.72	68.42	60.92	65.37	61.19	<b>67.11</b> *	<b>60.37</b> *	66.67	61.60	64.82	61.96	62.21	61.75	67.64	61.76
Health (poor) (%)	<b>4.87</b> *	<b>2.59</b> *	3.89	3.74	<b>8.59</b> ***	<b>2.37</b> ***	<b>7.55</b> **	<b>2.52</b> **	<b>8.04</b> *	<b>3.09</b> *	<b>6.86</b> *	<b>3.31</b> *	<b>6.45</b> **	<b>1.99</b> **	7.49	3.54
Physician screening (mean±SD)	<b>3.03</b> <b>±0.09</b> ***	<b>0.61</b> <b>±0.05</b> ***	<b>4.96</b> <b>±0.17</b> ***	<b>1.32</b> <b>±0.05</b> ***	<b>4.96</b> <b>±0.11</b> ***	<b>0.99</b> <b>±0.04</b> ***	<b>4.44</b> <b>±0.11</b> ***	<b>0.89</b> <b>±0.03</b> ***	<b>5.80</b> <b>±0.11</b> ***	<b>1.23</b> <b>±0.04</b> ***	<b>6.24</b> <b>±0.09</b> ***	<b>1.32</b> <b>±0.04</b> ***	<b>3.34</b> <b>±0.10</b> ***	<b>0.83</b> <b>±0.05</b> ***	<b>6.76</b> <b>±0.12</b> ***	<b>1.61</b> <b>±0.06</b> ***

Boldface indicates significant results (\* p<0.05 \*\* p<0.001 \*\*\*p<0.0001)

Table 3: Results of multivariate analysis comparing risk behaviour screening to significant independent variables, using “topic not addressed” as the reference category, in 1269 youths (17-26 years) in Fribourg, Switzerland.

Risk behaviour:	Eating disorders	Internet addiction	Alcohol misuse	Tobacco smoking	Marijuana use	Drug use	Emotional wellbeing	Problematic gambling
	OR 95%CI	OR 95%CI	OR 95%CI	OR 95%CI	OR 95%CI	OR 95%CI	OR 95%CI	OR 95%CI
Risk behaviour (present)	1.01 [0.71; 1.45]	0.9 [0.25; 3.19]	<b>1.91 *</b> [1.02; 3.58]	<b>4.40 ***</b> [2.55; 7.58]	<b>5.41 ***</b> [2.24; 13.09]	1.14 [0.36; 3.64]	1.1 [0.76; 1.60]	0.46 [0.12; 4.68]
Wish to address the item (yes)	<b>1.82 **</b> [1.33; 2.49]	1.49 [0.82; 2.71]	1.54 [0.82; 2.88]	<b>4.61 ***</b> [2.57; 8.27]	<b>6.93 ***</b> [2.90; 16.57]	2.18 [0.75; 6.35]	0.65 [0.41; 1.03]	
Mean age (Years ±SD)	0.94 [0.85; 1.04]	<b>0.82 *</b> [0.70; 0.97]	1.06 [0.89; 1.27]	<b>1.42 ***</b> [1.24; 1.63]	0.89 [0.72; 1.12]	1.01 [0.78; 1.30]	1 [0.90; 1.10]	1.06 [0.79 ; 1.41]
Gender (Male)	0.94 [0.68; 1.29]	<b>2.38 ***</b> [1.47; 2.87]	1.2 [0.65; 2.22]	<b>0.52 *</b> [0.29; 0.96]	1.55 [0.68; 3.51]	1.05 [0.38; 2.86]	<b>0.47 ***</b> [0.34; 0.66]	1.24 [0.41; 3.67]
Family SES (below average)			0.99 [0.42; 2.31]	1.51 [0.74; 3.10]	2.03 [0.74; 5.57]	<b>6.18 **</b> [2.05; 18.31]	0.83 [0.45; 1.55]	1.91 [0.52; 7.03]
Health (poor)	0.47 [0.17; 1.25]		1.58 [0.49; 5.15]	0.42 [0.13 ; 1.31]	1.24 [0.25; 6.00]	1.17 [0.28; 4.93]	1.79 [0.66; 4.82]	
Physician screening (Mean ±SD)	<b>3.67 ***</b> [2.80; 4.81]	<b>2.27 ***</b> [2.07; 2.49]	<b>7.28 ***</b> [5.13; 10.34]	<b>7.75 ***</b> [5.78; 10.40]	<b>6.61 ***</b> [4.94; 8.83]	<b>8.25 ***</b> [5.18; 13.13]	<b>2.72 ***</b> [2.31; 3.21]	<b>12.06 **</b> [2.57; 52.73]

There were no significant differences in terms of academic track.

Boldface indicates significant results (\*  $p < 0.05$  \*\*  $p < 0.001$  \*\*\*  $p < 0.0001$ )