

# Risk behaviors among Italian healthcare students: a cross-sectional study for health promotion of future healthcare workers

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**KEY WORDS:** risk behaviors; healthcare students; smoking; binge drinking; physical inactivity

**PAROLE CHIAVE:** comportamenti a rischio; studenti delle lauree sanitarie; fumo; binge drinking; inattività fisica

## SUMMARY

**Background:** Risk behaviors are frequent among young adults and they are particularly relevant when considering healthcare students. **Objectives:** The study is aimed to examine the prevalence of smoking, binge drinking, physical inactivity, and excessive bodyweight in a population of healthcare students attending an Italian university. **Methods:** Healthcare students filled an anonymous multiple-choice questionnaire on the occasion of the occupational health visit that preceded their hospital internship. The questionnaire covered socio-demographic characteristics (including student's working status and cohabitation) and risk behaviors. We evaluated the prevalence of risk behaviors and their association with socio-demographic characteristics. **Results:** The sample consisted of 494 students (65% women): 23.2% were smokers, 7.9% had excessive bodyweight, 35% did not practice any physical activity and 50% reported binge drinking at least once in the last 12 months. We found associations of male sex (30.5%) and being nursing students (29.9%) with smoking habit. The frequency of binge drinking was higher in men (38.4%), working students (53.9%), and among those who lived without family (50%). Physical inactivity was associated with female sex (44.2%) and living without family (57.1%). Finally, the co-presence of 2 risk behaviors or more was higher in men (36.8%), in nursing students (39.6%) and in working students (44.7%). **Conclusions:** Our findings regarding the prevalence of risk behaviors and their potential association with socio-demographic factors may be a clue to the definition of targeted strategies aimed at reducing of risk behaviors among healthcare students.

## RIASSUNTO

«Comportamenti a rischio tra gli studenti delle lauree sanitarie: studio trasversale per una promozione della salute degli operatori sanitari del futuro». **Introduzione:** I comportamenti a rischio sono frequenti tra i giovani adulti e appaiono particolarmente rilevanti negli studenti di lauree sanitarie **Obiettivi:** Questo studio ha l'obiettivo di esaminare la prevalenza del fumo, binge drinking, inattività fisica e sovrappeso in una popolazione di studenti delle lauree sanitarie di un'università italiana **Metodi:** Studenti delle lauree sanitarie hanno compilato un questionario anonimo a risposta multipla somministrato durante la visita effettuata dal medico competente prima del tirocinio ospedaliero. Il questionario ha raccolto caratteristiche socio-demografiche (incluso stato lavorativo e abitativo)

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e comportamenti a rischio **Risultati:** Il campione è costituito di 494 soggetti (65% donne): 23,2% erano fumatori, 7,9% erano in sovrappeso, 35% degli studenti non praticava attività fisica e 50% riferiva di avere praticato binge drinking almeno una volta negli ultimi 12 mesi. La prevalenza di fumatori era maggiore tra gli uomini (30,5%) e gli studenti di infermieristica (29,9%). La frequenza di binge drinking era maggiore tra gli uomini (38,4%), gli studenti-lavoratori (53,9%) e chi viveva senza famiglia (50%). L'inattività fisica è risultata associata con il sesso femminile (44,2%) e con il vivere in assenza di familiari (57,1%). Infine la presenza di almeno 2 comportamenti a rischio era maggiore negli uomini (36,8%), negli studenti di infermieristica (39,6%) e negli studenti-lavoratori (44,7%). **Conclusioni:** I nostri dati riguardanti la prevalenza dei comportamenti a rischio e le potenziali associazioni con fattori socio-demografici potrebbe essere un importante punto di partenza per la definizione di strategie specifiche finalizzate alla riduzione dei comportamenti a rischio tra gli studenti delle lauree sanitarie.

## INTRODUCTION

Risk behaviors are lifestyle characteristics likely to cause potential harm to the subject, both from a physical and a psychological point of view. They generally include smoking habit, alcohol abuse, physical inactivity, and excessive bodyweight (5). Scientific literature shows that risky habits are usually adopted during adolescence (4). Nevertheless, they could exacerbate and become permanent between 18 and 30 years, when young adults experience a significant amount of stress (22). In fact, during this time, individuals often leave their usual social contexts and confront new academic and working challenges. In addition, there is evidence that unhealthy lifestyles among young adults are strongly linked to disabilities and health problems (12, 28). Therefore, if these behaviors are detected and modified at an early stage, dangerous developments could be avoided (23). In recent years, some academic institutions have tried to address the problem among their students, implementing the concept of "health promoting universities and colleges". Several documents have been produced, the last being the "Okanagan Charter", aimed at creating campus culture of well-being and improving the health of the people who live, learn, and work in university campuses, including students (20).

The problem of risk behaviors becomes stringent when considering healthcare students. They – as future health care providers – will play a key role in health promotion and their attitude highly influences not only their health and performance, but also the health status of their patients as well as of the general population. Some studies suggest that the healthy behaviors of healthcare workers influ-

ence patients' attitudes towards preventive counseling and their motivation towards healthy lifestyle choices (9). So, healthcare workers and students who themselves lead healthy lifestyles are more likely to have a positive influence on patients and help them make healthy choices (1, 8, 17).

Furthermore, since these students are in close contact with patients, risk behaviors may be a problem during their hospital internship. In fact, risk behaviors of these students could affect their health, increase occupational injuries and impair the relation with patients (14). For example, binge drinking and alcohol abuse may cause sleep disruptions and alterations in the circadian rhythm in young people, hence increasing the risks of clinical mistakes and work-related injuries in unskilled students. Similarly, overweight and obesity may contribute to musculoskeletal disorders and physical injuries, mainly within nursing students (14). Smoking habit might increase the cancer risk among x-ray technician students, potentially exposed to ionizing radiations. Finally, occupational hazards in healthcare sector (long working hours, shiftwork, stress, limited access to healthy and regular food, sedentary jobs) could themselves influence employees' health risk behavior.

For these reasons, universities should provide healthcare students with adequate training on the promotion of healthy behaviors. In order to design efficient strategies for the reduction of unhealthy habits, academic institutions should conduct studies to examine the influence of risk behaviors within the specific population of healthcare students (20). Italian occupational physicians started to address this issue during a conference organized in Milan

in 2016, attended by the representatives of all the universities of Lombardy, the most populous and richest region in Italy (24).

Our study aims to investigate the prevalence of risk behaviors (smoking, binge drinking, physical inactivity, and excessive bodyweight) in a population of healthcare students attending an Italian university of Northern Italy. Our focus was on the evaluation of the possible associations between unhealthy behaviors and some socio-demographic factors in such a population. We might, in this way, identify specific health promotion programs targeted at the population of healthcare students (6).

## METHODS

The study analyzed a population of healthcare students, in the Department of medicine and surgery of a University in Northern Italy. The subjects attended the following courses: medicine and surgery, dentistry, nursing, physiotherapy, biomedical laboratory techniques, x-ray techniques, and neuro- and psychomotricity therapies of infancy. Data were collected during the academic year 2015-2016. All students were invited to fill in an anonymous self-administered questionnaire on the occasion of the health examination that precedes the hospital internship. Participation was voluntary. We collected the following socio-demographic characteristics: sex, type of course (medical and dental schools; nursing school; other healthcare schools), working status (non-working student, working student), and cohabitation (with family, without family). The questionnaire also included items on the following risk behaviors: smoking habit (yes, no), number of cigarettes per day, binge drinking in the last year (yes, no), frequency of binge drinking (never in the last 2 months, at least once in the last 2 months), physical activity (active, inactive), and BMI ( $<25$  kg/m<sup>2</sup>,  $\geq 25$  kg/m<sup>2</sup>). We also considered the number of coexisting risk behaviors (smoking, binge drinking, BMI  $\geq 25$  kg/m<sup>2</sup> and physical inactivity). In our inquiry, we adopted a definition of binge drinking given by the National Institute on Alcohol Abuse and Alcoholism (NIAAA), namely the consumption within a period of two hours of  $\geq 5$  UA (Unit of Alcohol) for men, and of  $\geq 4$  UA for women.

## Statistical analysis

Age was presented as a mean with standard deviation (SD), while dichotomous variables were presented as numbers and proportions. For statistical analysis, several tests were used. Student t-test was used to compare means. The association between socio-demographic characteristics and risk factors was evaluated by Pearson's chi-square test or Fisher's exact test (when the expected frequencies were less than or equal to 5). To assess the impact of missing data we performed sensitivity analysis including only questionnaires reporting all the data.

## RESULTS

The students who accepted to fill in the questionnaire and included in the survey were 494 (65% women). Students were equally distributed across three degree courses: Medicine/Dentistry (33.4%), Nursing (34%) and Other Health Professions (32.6%). Eight point four percent of them declared to be a working student, 10% were living without family.

As shown in table 1, 23.2% of the students were smokers and 5.5% smoked between 10 and 20 cigarettes a day (no student declared to smoke more than 20 cigarettes per day). Half of the students referred to have practiced binge drinking at least once in the last 12 months, and 14.6% of them declared more than one episode every two months. Thirty-five percent of the individuals did not practice any weekly physical activity. Excessive bodyweight (BMI  $\geq 25$  kg/m<sup>2</sup>) was present in 7.9% of subjects. In particu-

**Table 1** - Prevalence of risk behaviors (n. 494)

Risk Behaviors	N	%
Smoking	113	23.2
Smoking ( $\geq 10$ cigarettes/day)	27	5.5
Binge drinking	244	50.0
Frequency of binge drinking ( $\geq 1$ every 2 months)	72	14.6
Physical inactivity	171	35.0
BMI $\geq 25$ kg/m <sup>2</sup>	37	7.9
Coexisting risk behaviors (2 or more)	139	29.9

lar, 6.6% were overweight and 1.3% were obese. As to the co-existence of risk behaviors, 23.2% of students did not present any of the four risk behaviors (smoking habit, binge drinking, physical inactivity, and BMI  $\geq 25$  kg/m<sup>2</sup>) and 29.9% presented two or more risk behaviors. In detail, 46.9% presented with one risk factor, 21.5% with two risk behaviors, 8.2% with three risk behaviors, and only one student with four risk behaviors.

### Associations between risk behaviors and socio-demographic factors

We analyzed the associations between risks behaviors and socio-demographic characteristics. We found statistically significant associations between smoking habit and sex and type of course (nursing students had the highest smoking habit) (table 2). We found an association of the number of cigarettes smoked per day with occupational status: 50% of working students smoked more than 10 cigarettes per day, while only 20.2% of non-working students smoked more than 10 cigarettes per day (table 2). Binge drinking, was associated with sex (male) (table 3). Among those who practiced binge drinking at least once every 2 months, 38.4%

were men, 53.9% were working students, and 50% lived without family (table 3). No associations with socio-demographic characteristics was evident for BMI (table 4). We found significant associations of physical inactivity with sex and cohabitation status, 44.2% of women and 57.1% of subjects living without family were physically inactive (table 4). The number of coexisting risk behaviors was associated with sex, type of course, and occupational status. Among men 36.8% had two or more coexisting risk behaviors. Similarly, two or more risk behaviors were presented in 39.6% of nursing students and 44.7% of working students (table 4). The reliability of our results was confirmed in the sensitivity analysis. No differences in these results were observed considering only the subjects with all data reported in the questionnaire.

### DISCUSSION

We discuss the data from our survey in the light of similar data recorded by ISTAT (Italian National Statistical Institute) among young adults in recent years (13) and of the results from surveys conducted on a population of Italian university students and of healthcare students (6, 21).

**Table 2** - Associations between smoking and socio-demographic characteristics

	No smoking	Smoking	p-value	<10 cigarettes/day*	$\geq 10$ cigarettes/day*	p-value
Male	116 (69.5%)	51 (30.5%)	<i>0.0083</i>	36 (70.6%)	15 (29.4%)	<i>0.2122</i>
Female	251 (80.2%)	62 (19.8%)		50 (80.7%)	12 (19.4%)	
Age (years)	20.7 $\pm$ 2.5	20.3 $\pm$ 1.7	<i>0.1191</i>	20.1 $\pm$ 1.5	21.0 $\pm$ 2.1	<i>0.0602</i>
Medical/Dentistry students	137 (83.5%)	27 (16.5%)	<i>0.0159</i>	25 (92.6%)	2 (7.4%)	<i>0.0700</i>
Nursing students	115 (70.1%)	49 (29.9%)		35 (71.4%)	14 (28.6%)	
Other students	122 (76.7%)	37 (23.3%)		26 (70.3%)	11 (29.7%)	
Non-working students	347 (77.8%)	99 (22.2%)	<i>0.0663</i>	79 (79.8%)	20 (20.2%)	<i>0.0384</i>
Working students	26 (65%)	14 (35.0%)		7 (50.0%)	7 (50.0%)	
Cohabit with family	341 (77.7%)	98 (22.3%)	<i>0.1642</i>	74 (75.5%)	24 (24.5%)	<i>0.9999</i>
Cohabit without family	33 (68.8%)	15 (31.3%)		12 (80%)	3 (20%)	

\* Only smoker students. Data are shown as n (%) or mean $\pm$ standard deviation. Chi-square or Fisher's exact test for categorical variables and t-test for age.

**Table 3** - Associations between binge drinking and socio-demographic characteristics

	No binge drinking	Binge drinking	p-value	<1 every 2 months*	≥1 every 2 months*	p-value
Male	43 (25.4%)	126 (74.6%)	<0.0001	77 (61.6%)	48 (38.4%)	0.0027
Female	196 (62.9%)	116 (37.2%)		92 (79.3%)	24 (20.7%)	
Age (years)	20.7±2.5	20.5±2.5	0.5294	20.4±2.1	20.8±2.5	0.2775
Medical/Dentistry students	88 (53.3%)	77 (46.7%)	0.5672	58 (76.3%)	18 (23.7%)	0.3864
Nursing students	78 (47.9%)	85 (52.2%)		58 (68.2%)	27 (31.8%)	
Other students	78 (48.8%)	82 (51.3%)		55 (67.1%)	27 (32.9%)	
Non-working students	228 (51.1%)	218 (48.9%)	0.0748	159 (73.3%)	58 (26.7%)	0.0042
Working students	15 (36.6%)	26 (63.4%)		12 (46.2%)	14 (53.9%)	
Cohabit with family	215 (49%)	224 (51%)	0.1752	161 (72.2%)	62 (27.8%)	0.0373
Cohabit without family	29 (59.2%)	20 (40.8%)		10 (50%)	10 (50%)	

\*Only Binge drinking. Data are shown as n (%) or mean±standard deviation. Chi-square for categorical variables and t-test for age.

**Table 4** - Associations between overweight, physical inactivity, coexisting risk factors and socio-demographic characteristics

	BMI <25kg/m <sup>2</sup>	BMI ≥25kg/m <sup>2</sup>	p-value	Physical activity	Physical inactivity	p-value	Coexisting risk factors<2	Coexisting risk factors≥2	p-value
Male	150 (89.3%)	18 (10.7%)	0.0730	140 (82.8%)	29 (17.2%)	<0.0001	105 (63.3%)	61 (36.8%)	0.0177
Female	278 (93.9%)	18 (6.1%)		174 (55.8%)	138 (44.2%)		217 (73.8%)	77 (26.2%)	
Age (years)	20.6±2.2	21.1±3.5	0.4114	20.6±2.1	20.7±2.8	0.6279	20.6±2.3	20.5±2.4	0.6419
Medical/Dentistry students	150 (93.8%)	10 (6.3%)	0.5036	111 (67.3%)	54 (32.7%)	0.1333	124 (78%)	35 (22%)	0.0027
Nursing students	144 (92.3%)	12 (7.7%)		96 (58.9%)	67 (41.1%)		93 (60.4%)	61 (39.6%)	
Other students	138 (90.2%)	15 (9.8%)		110 (68.8%)	50 (31.3%)		109 (71.7%)	43 (28.3%)	
Non-working students	395 (91.9%)	35 (8.1%)	0.7571	290 (65%)	156 (35%)	0.8365	305 (71.4%)	122 (28.6%)	0.0370
Working students	37 (94.9%)	2 (5.1%)		26 (63.4%)	15 (36.6%)		21 (55.3%)	17 (44.7%)	
Cohabit with family	390 (92.4%)	32 (7.6%)	0.4012	296 (67.4%)	143 (32.6%)	0.0006	299 (71.4%)	120 (28.6%)	0.0749
Cohabit without family	42 (89.4%)	5 (10.6%)		21 (42.9%)	28 (57.1%)		27 (58.7%)	19 (41.3%)	

Data are shown as n (%) or mean±standard deviation. Chi-square or Fisher's exact test for categorical variables and t-test for age.



## Smoking habit

The prevalence of smokers was 23.2%, consistent with data regarding smoking habit among Italian young adults (19% between 18 and 19 years of age, and 23.9% between 20 and 24 years) (13). This prevalence was lower than among Italian university students in other surveys (38.5%) (6). When analyzing papers on healthcare students we found that smoking prevalence ranged from 19.2% to 45% (10, 18, 25). It is worth noting that the prevalence of smoking was higher among Italians than foreign students (2, 16). The association between smoking habit and sex (male) and student course (nursing students) was observed in other researchers (3, 6, 7, 13). In our study, 76.1% of students smoked less than 10 cigarettes a day. This result was consistent with data of the Italian young adult population (6, 13). Overall, our research showed an association between total number of cigarettes smoked per day and working status of the student.

## Binge drinking

Fifty percent of the students practiced binge drinking at least once within the last 12 months. This figure was higher than in the Italian young adult population (17% between 18 and 24 years old) (13). It could be explained by the different definition of binge drinking adopted by ISTAT, i.e. the consumption of  $\geq 6$  UA, within a single occasion, irrespective of sex. In contrast, we followed the definition given by the NIAAA, i.e. the consumption within a period of two hours of  $\geq 5$  UA for men, and of  $\geq 4$  UA for women. We also confirmed the association between binge drinking and sex, as evidenced in other surveys (13). Finally, 70.4% of binge drinkers declared less than one episode every two months (i.e.  $< 6$  times per year).

Other Italian surveys did not seem to have specifically investigated binge drinking but only alcohol drinking frequency. For example, a recent study conducted in 2017 at the Second University of Naples on under- and post-graduate healthcare students evidenced that 76.1% of subjects drink alcohol regularly (85% of medical students, 77.4% of medical residents, and 63% of other healthcare

students). This behavior proved to be higher among men, smokers, younger subjects, and students with lower BMI (15). In another survey on university students, the prevalence of subjects who declared to drink weekly alcoholic beverages was 42.2% (21).

## Physical inactivity and excessive bodyweight

Our study revealed that 35% of students were physically inactive (i.e. they never or almost never practice physical activity). Our subjects proved to be less active than Italian young adults (13) and to be more physically inactive than other Italian university students (6). Our study confirmed the association between physical inactivity and sex (female) and cohabitation status (living without family) (6, 13).

Within our sample, 7.9% of subjects had excessive bodyweight. Data regarding Italian young adults (18-24 years old) derived from ISTAT surveys, show 17.4% of subjects with excessive bodyweight (13). Our prevalence was also lower than among Italian university students (11.2% of excessive bodyweight) (6). Interestingly, we could not find any correlation between excessive bodyweight and the considered socio-demographic factors. In spite of a higher prevalence of physical inactivity, our population showed a lower BMI than general population. This figure could be explained by more attention paid to diet and healthy food within our population of healthcare students.

## Associations of coexisting risk behaviors

When examining the coexistence of smoking habit, binge drinking, physical inactivity, and excessive bodyweight, 48.9% of the students had one risk behavior, 21.5% two risk behaviors, and 8.4% three or four risk behaviors; the remaining 23.2% declared no risk behaviors. These results were at odds with ISTAT data regarding Italian young adults, according to which 32.2% of subjects presented with no risk factor, 39.1% with one risk factor, 22.3% with two risk behaviors, and 6.4% with three or four risk behaviors (13). The difference between these results could be explained by several factors. ISTAT examined a broader age group (14-44 years old) and considered in addition to the four factors reported in

our study, the influence of high daily consumption of alcohol. Our study, in addition, adopted a more stringent definition of binge drinking as compared with the one used by ISTAT.

Regarding the associations with total number of coexisting risk behaviors, this study confirmed a documented correlation with sex (male) (6) and showed for the first time an association with degree course (nursing students) and occupational status (working students). On the contrary, it did not show any association with subjects' age. No other studies examined the coexistence of risk behaviors within Italian university students and healthcare students.

## CONCLUSIONS

When considering the influence of risk behaviors on young adults, healthcare students represent a sensitive group of individuals. Healthcare students with risk behaviors might put not only their health at risk, but also the health of their patients. This condition is relevant not only during their internship while they attend the university courses, but also in the future perspective of a healthcare employment. Therefore, as health promoting universities, academic institutions should act to minimize the impact of negative behaviors on all their students. By doing so, they could help not only the students, but the community as a whole (20). This goal could be achieved by adopting health promotion programs. Notably, several universities have already implemented programs to improve the wellbeing of their students and of the communities they belong to (11, 19, 26, 27). Such initiatives should be tailored to the population characteristics.

For this reason, by providing information on prevalence of risk behaviors and the potential associations with socio-demographic factors, this study might be an important starting point in the definition of targeted strategies, aimed at reducing risk behaviors. The occupational health physicians working in universities and in other educational institutions, could play an important role in the assessment of health promotion needs. Indeed, the preventive and periodic health examinations are not only convenient opportunities for medical counselling, but also for collecting important data on population

characteristics. This survey examined the health and wellbeing behaviors of its own healthcare student population, and highlighted some behaviors that are similar to expectations, and others that are not. This information will enable to tailor programs and interventions aimed at specific groups of students. For example, in our study population health promotion interventions should be mainly addressed towards nursing students, who seemed to have a higher prevalence of coexisting risk factors (particularly smoking habit). Similarly, specific interventions should also be addressed towards male students and working students, while physical activity should be mainly improved among female students.

The present study also has limitations. First, the design of the study was monocentric, since students were selected from a single university. Therefore, the sample cannot be considered representative of the actual Italian population of healthcare students. Second, the average age of the students was not homogenous across degree courses and statistically significant differences were found among them. Finally, individuals within our population could have minimized the magnitude of their risk behaviors, even if the questionnaire was anonymous. In fact, they could have concealed their unhealthy behaviors on account of their role as healthcare students.

Despite these limitations, our study is the first, to our knowledge, to investigate risk behaviors (including binge drinking) in a broad population of healthcare students, analyzing differences across different healthcare courses.

In conclusion, university attendance is a transitional period offering good opportunities for acquisition of healthy lifestyles. Occupational Health Services in the universities could be a reference point for all the initiatives of health promotion addressed to the student population, i.e. the tomorrow's workforce.

NO POTENTIAL CONFLICT OF INTEREST RELEVANT TO THIS ARTICLE WAS REPORTED BY THE AUTHORS

## REFERENCES

1. Alba LH, Badoui N, Gil F: Attitude toward preventive counseling and healthy practices among medical students at a Colombian university. *Front Med* 2015; 9: 251-259

2. Armstrong GW, Veronese G, George PF, et al: Assessment of Tobacco Habits, Attitudes, and Education Among Medical Students in the United States and Italy: A Cross-sectional Survey. *J Prev Med Pub Health* 2017; 50: 177-187
3. Biraghi E, Tortorano AM: Tobacco smoking habits among nursing students and the influence of family and peer smoking behaviour. *J Adv Nurs* 2010; 66: 33-39
4. Cavallo F, Giacchi M, Vieno A, et al: Studio HBSC-Italia (Health Behaviour in School-aged Children): rapporto sui dati 2010. Roma: Istituto Superiore di Sanità, 2013
5. Danaei G, Ding EL, Mozaffarian D, et al: The Preventable Causes of Death in the United States: Comparative Risk Assessment of Dietary, Lifestyle, and Metabolic Risk Factors. *PLoS Med* 2009; 6: e1000058
6. Di Pietro ML, Bellantone R, Pacifici R, Ricciardi W: The "Sportello Salute Giovani" project: Habits, lifestyles, risk behaviours of Italian University students and future perspectives. Preface. *Ann Ist Super Sanita* 2015; 51: 93-95
7. Ferrante M, Saulle R, Ledda C, et al: Prevalence of smoking habits, attitudes, knowledge and beliefs among Health Professional School students: a cross-sectional study. *Ann Ist Super Sanita* 2013; 49: 143-149
8. Frank E, Carrera JS, Elon L, Hertzberg VS: Predictors of US medical students' prevention counseling practices. *Prev Med* 2007; 44: 76-81
9. Frank E, Rothenberg R, Lewis C, Belodoff BF: Correlates of physicians' prevention-related practices. Findings from the Women Physicians' Health Study. *Arch Fam Med* 2000; 9: 359-367
10. Gallotti C, Maccagni M, Roncarolo F, et al: L'abitudine al fumo negli studenti del Corso di Laurea in Infermieristica dell'Università di Pavia. *Ann Ig* 2008; 20: 563-569
11. Haas J, Baber M, Byrom N, et al: Changes in student physical health behaviour: an opportunity to turn the concept of a Healthy University into a reality. *Perspect Public Health* 2018; 138: 316-324
12. Haddad LG, Owies A, Mansour A: Wellness Appraisal among Adolescents in Jordan: A Model from Developing Country: A Cross-Sectional Questionnaire. *Health Promot Int* 2009; 24: 130-139
13. ISTAT database, dati.istat.it
14. Jordan G, Nowrouzi-Kia B, Gohar B, Nowrouzi B: Obesity as a Possible Risk Factor for Lost-time Injury in Registered Nurses: A Literature Review. *Saf Health Work* 2015; 6: 1-8
15. Lamberti M, Napolitano F, Napolitano P, et al: Prevalence of alcohol use disorders among under- and post-graduate healthcare students in Italy. *PLOS ONE* 2017; 12: e0175719
16. La Torre G, Kirch W, Bes-Rastrollo M, et al: GHPSS Collaborative Group. Tobacco use among medical students in Europe: results of a multicentre study using the Global Health Professions Student Survey. *Public Health* 2012; 126: 159-164
17. Lobelo F, Duperly J, Frank E: Physical activity habits of doctors and medical students influence their counselling practices. *Br J Sports Med* 2009; 43: 89-92
18. Lucenteforte E, Vannacci A, Cipollini F, et al: Smoking habits among university students in Florence: is a medical degree course the right choice? *Prev Med* 2010; 51: 429-430
19. Newton J, Dooris M, Wills J: Healthy universities: an example of a whole-system health-promoting setting. *Glob Health Promot* 2016; 23: 57-65
20. Okanagan Charter - An international charter for health promoting universities and colleges. An outcome of the 2015 International Conference on Health Promoting Universities and Colleges / VII International Congress. 2015
21. Poscia A, Parente P, Frisicale Em, et al: Risky behaviours among university students in Italy. *Ann Ist Super Sanita* 2015; 51: 111-115
22. Regehr C, Glancy D, Pitts A: Interventions to reduce stress in university students: a review and meta-analysis. *J Affect Disord* 2013; 148: 1-11
23. Rew L, Horner SD: Youth Resilience Framework for reducing health-risk behaviors in adolescents. *J Pediatr Nurs* 2003; 18: 379-838
24. Riva MA, Ferrario MM: Lavoratori-Studenti: Rischi e idoneità nell'alternanza scuola-lavoro, nei tirocini e nei corsi di laurea universitari, Milano, 11 marzo 2016. *Med Lav* 2016; 6: 490-491
25. Saulle R, Bontempi C, Baldo V, et al: 2013. GHPSS multicenter Italian survey: smoking prevalence, knowledge and attitudes, and tobacco cessation training among third-year medical students. *Tumori* 2013; 99: 17-22
26. Suárez-Reyes M, Van den Broucke S: Implementing the Health Promoting University approach in culturally different contexts: a systematic review. *Glob Health Promot* 2016; 23: 46-56
27. Tsouros A, Dowding G, Thompson J, et al: Health promoting universities: concept, experience and framework for action. Copenhagen: WHO Regional Office for Europe, 1998
28. Wang D, Xing XH, Wu XB: Healthy lifestyles of university students in China and influential factors. *Scientific World Journal* 2013; 2013: 412950