

RISK ASSESSMENT PRACTICE IN HYGIENIC AND EPIDEMIOLOGICAL STUDIES

UDC 613.956

THE EMPLOYMENT OF HIGH SCHOOL PUPILS AND VOCATIONAL SCHOOL STUDENTS: MEDICAL AND SOCIAL ASPECTS, HEALTH RISKS, APPROACHES TO OPTIMIZATION

V.Yu. Ivanov, E.I. Shubochkina, E.M. Ibragimova

FSBI "Scientific Center of Children's Health" of the Ministry of Health of the Russian Federation, Building 5, house 5, Maly Kazenny per., Moscow, 105064, Russian Federation

The aim of this study is to investigate the employment characteristics and its impact on lifestyle and health of adolescents as well as to develop preventive recommendations. The objects of the study are the employment, life quality and health of adolescents working in their spare time.

Materials and methods: the surveys were conducted among 575 persons at the age from fourteen till eighteen (senior pupils – 331 people, students of vocational schools – 244 people) in Moscow. The life quality was assessed using the standardized questionnaire MOS SF-36.

Results. A number of teens working in free time from their study is 37.7 %. The predominance of informal employment was revealed. The structure of employment of senior pupils and vocational school students is represented. In the group of the working adolescents there is a higher prevalence of the behavioral factors of risk (smoking, drinking of alcoholic beverages and addiction to drugs). The effect of the employment of high school pupils on health is shown, health risks due to employment are determined: increase in complaints of headaches and increase in the group of the "frequently ill". The most evident negative influence of the factor of employment is established in the group of vocational school students: the high risk of back pain, pain in the legs (in healthy individuals), undifferentiated complaints, poor physical form, deterioration of quality of life (in individuals with chronic pathology). In secondary schools and vocational schools there is the need to implement educational programs on health protection of adolescent workers, raise the level of preparedness to enter the labour market, the choice of the work type taking into account health status.

Key words: school pupils, vocational school students, employment of teens, working adolescents, work of minors, life quality of adolescents, health risks of adolescents, health protection of students.

Introduction. Employment in spare time is considered to be one of the most widely spread and important ways of socialization for school and college teenagers and higher educational establishment students in many countries [2,3,4,5,6,7,9,11,12,14]. Getting educated during juvenile period is a primary social task and paid labor in spare time is a main form of participation in work activities.

According to the Russian Federation Labor Code teenagers can combine study and work from the age of 14 provided that their working hours are limited and they are occupied with types of work

allowed for this age group; we can see that in practice these rules are frequently broken [10]. Teenagers' employment nature in modern market economy and effects exerted by non-educational additional work on a growing organism have not been comprehensively examined [3,4]. As negative trends in young people health parameters continue to prevail [1] we consider it necessary to assess employment influence on life style and health of studying teenagers.

Research goals and tasks – to examine medical and social peculiarities of studying teenagers' employment, detect risk factors and

Ó Ivanov V.Yu., Shubochkina E.I., Ibragimova E.M., 2016

Ivanov Viktor Yurievich – Candidate of Medicine, Senior Researcher, Laboratory of Hygiene of vocational education, career guidance and labor of teenagers (e-mail: viktor_ivanov_08@mail.ru; tel.: +7 (495) 917-46-39).

Shubochkina Evgeniya Ivanovna – Doctor of Medicine, head of Laboratory of Hygiene of vocational education, career guidance and labor of teenagers (e-mail: adlabhyg@yandex.ru; tel.: +7 (495) 917-46-39).

Ibragimova Evgeniya Mikhailovna – Candidate of Medicine, Senior Researcher, Laboratory of Hygiene of vocational education, career guidance and labor of teenagers (e-mail: adlabhyg@yandex.ru; tel.: +7 (495) 917-46-39).

work out preventive guidelines aimed at elimination of negative influence on health.

Data and methods. We carried out the research of non-educational employment among senior pupils in secondary schools and vocational colleges' students in Moscow. We questioned 575 people aged from 14 to 18. Teenagers who didn't work in their spare time were included into comparative groups. We assessed students' medical and social status with the use of a specially designed questionnaire which included sections on a teenager's family, his or her lifestyle, screening evaluation of health, and employment details. To assess life quality related to health we used MOS SF-36 questionnaire [13]. Only teenagers who gave us informed agreement took part in the research. We calculated and assessed risks (relative risks – RR, odds relation – OR) [7]. Data statistical processing was accomplished with the use of Microsoft Excel and Statistica 7.0.

Results and discussion. The obtained data proved that employment in spare time was spread among teenagers in Moscow. The number of students having a job was not authentically different in various educational establishments and amounted to 37.7% of respondents on average. Among the main reasons for employment we detected a desire to have one's own money and to help a family (63.6% and 20.7% correspondingly). Other reasons such as interest to master a profession and a wish to get professional experience (8.8% and 7.8%), as well as a way to find something to do in spare time (6.9%) were significantly rare; only 1.8% respondents claimed it was their parents' desire. It should be noted that school pupils named such reasons as "interest to master a profession" and "a wish to get professional experience" twice more often than college students. It can be caused by absence of pre-occupational training and practice-oriented system of senior pupils' occupational orientation in secondary schools.

A significant feature of students' work activities was prevalence of illegal employment (informal employment). Only 30% of all working students signed labor contracts, and only 15.7% had a work-record book. Official employment was authentically higher among college students than among school pupils (35.4% and 25.5% correspondingly).

Most students worked during academic year only periodically and more frequently during vacations, but 17.1% stated they worked permanently. A number of students having permanent work was 2 times higher in colleges than

in schools. Average working hours a day and a week in junior and senior teenagers groups (14-15 years and 16-17 years) didn't exceed permissible length. However, some individual cases were marked with significantly longer working hours a day and a week than it was permitted for teenagers by law.

A great number of working teenagers didn't want to give any details of their work and gave such answers as "it doesn't matter" or "it's not important". It was more frequent among school pupils (52.1%) than among college students (32.1%). It can be due to a simple unwillingness; or we can suspect a possible employment in shady spheres or work where labor of people who are under 18 is strictly prohibited.

We assessed the employment structure according to students' sample who gave their employment details. School pupils most frequently worked as promoters distributing leaflets in the streets or took part in advertising events (37.9%); they were also employed in retail trade (20.7%) and worked as couriers (15.5%). About 7% worked on PC (freelance, proof-reading and working as operators, programming etc.), and about the same amount were employed in arts (taking part in movies, photo sessions, and various shows). Another 7% worked for car services or as shiftmen and street cleaners.

The first four rank places in employment structure of college students belonged to retail trade, courier services, catering (working as waiters, bar tenders, caretakers etc.), and promotional activities. All these types of employment amounted to from 21.2% to 16.7% correspondingly. Work with great amount of hard physical labor accounted for 12% (casual work, cargo handling, construction and some other spheres). Services amounted to 6.1% and work on PC to 3%. Thus, the number of students involved in hard physical labor was twice higher among college students than among senior pupils while PC work was mentioned two times less frequently.

Social characteristics of senior pupils' families showed that teenagers form one-parent families worked more often (45.5% against 30%, $p < 0.01$) and it allows us to speak about social and economic reasons for early employment.

Working pupils were more often drawn into psychoactive substances taking (table 1). Also more than a half of working students had acquaintances who took drugs and it was considerably more than among students without any working experience. Additional efforts caused by combining study and

work also led to day regimen disturbance which was seen in shorter time of sleep.

Most health parameters in compared subgroups didn't have any discrepancies. There were more people with frequent acute respiratory virus diseases in academic year among working pupils (38.8% and 24.7% among those who didn't work, $p < 0.05$). When assessing prevalence and structure of complaints given by pupils we defined that the complaints number was similar in both groups and amounted to 3.1 per one person, but working teenagers complained about headaches authentically more frequently (37.2% against

21.9%, $p < 0.01$). As for other complaints we didn't detect any discrepancies.

Table 2 shows the risks which are characteristic for working pupils as well as their relation to an assessed factor (employment).

Increase in "often sick" number and growing number of pupils with headaches has average degree of relation to the stated factor and it proves its significance for senior school children's health impairment.

Life quality assessment with the use of MOS SF-36 questionnaire didn't detect any authentic discrepancies in examined parameters in compared groups (table 3).

Table 1

Peculiarities of senior pupils' life style with employment factor taken into account

Parameter	Work (n = 121)		Don't work (n = 210)		p*
	abs.	%	abs.	%	
Smoke	63	52.1	44	21.0	$p < 0.001$
Took drugs	18	14.9	11	5.2	$p < 0.01$
Drink alcohol 2-3 times and month and more frequently	23	19.0	13	6.2	$p < 0.05$
Length of sleep – 6 часов	43	35.5	57	27.1	$p < 0.05$

Note: * – as per Chi-square criterion.

Table 2

Health impairment risks for working pupils

Parameters	Odds relation (OR) (95% CI)	Relative risk (RR) (95% CI)	Degree of relation to a risk factor
Complaints on headaches	2.1 (1.27–3.52)	1.7 (1.18–2.44)	Average
«Often sick» (3-4 times and more)	1.9 (1.17–3.19)	1.6 (1.11–2.21)	Average

Table 3

Schoolchildren life quality assessment with the use of MOS SF-36 questionnaire*

Groups/number of people (n)		PF	RPF	P	GH	AL	SF	REF	MH
Work (n = 121)	M	90.2	72.5	72.0	70.4	62.7	77.0	64.7	67.6
	±m	1.4	2.4	2.2	1.8	1.8	1.8	3.3	1.6
Don't work (n=210)	M	91.5	74.3	75.9	70.1	59.6	81.2	61.9	65.5
	±m	0.8	2.0	1.6	1.3	1.5	1.3	2.5	1.2

Note: hereinafter in Table. 6 * – Scales: PF – physical functioning; RPF – role functioning resulting from physical state; P – pain intensity; GH – general health status; AL – activity in life; SF – social functioning; REF – role functioning resulting from emotional state; MH – mental health.

Social status and lifestyle of working college students didn't have any authentic discrepancies from those of college students who didn't work in their spare time. We found such discrepancies only in length of sleep. 34.4% of working teenagers

stated they slept for 6 hours and only 22.3% in comparison group also had such shorter period of night sleep ($p < 0.05$). Bad habits were greatly spread among college students regardless of employment factor. Thus, more than 50%

respondents smoked; from 19% to 26% drank alcohol 2-3 times a month or even more often; about 10% tasted drugs.

Prenosological health assessment showed that working teenagers claimed to have chronic diseases more often than those who didn't work (36.5% and 23.6% correspondingly, $p < 0.05$). In

relation to that all college students were divided into 4 groups taking employment factor and chronic diseases into account (table 4). The data proved such division was well-grounded as we detected discrepancies in health parameters among teenagers with and without chronic pathologies in their case history (groups A and B).

Table 4

Medical and social characteristics of college students with their health (group A and B) and employment factor taken into account

Parameters	A. Teenagers with chronic pathology				B. Teenagers without chronic pathology			
	Didn't work (n = 35)		Work (n = 35)		Didn't work (n = 113)		Work (n = 61)	
	abs.	%	abs.	%	abs.	%	abs.	%
Have complaints**	23	65.7 (3.7)	21	60.0 (3.9)	38	33.6 (2.5)	21	34.4 (2.8)
Have visual impairment	12	34.3	11	31.4	32	28.3	22	36.1
Have allergic reactions	14	40.0	16	45.7	27	23.9	16	26.2
Health index	6	17.1	3	8.6	14	12.4	7	11.5
"Often sick" group	17	48.6	18	51.4	37	32.9	15	24.6
Are very tired after classes	6	17.1	7	20.0	13	11.5	9	14.8
Poor physical health	5	14.3	16	45.7*	23	20.4	9	14.8
Bad mood	4	11.4	6	17.1	13	11.5	7	11.5
Length of sleep - 6 hours a day	8	22.9	18	51.4*	25	22.1	15	24.6

Note: * – $p < 0.05$ in a subgroup (as per Chi-square criterion), ** – number of complaints per one person is given in brackets.

We didn't see any authentic discrepancies between working and not working healthy teenagers (subgroup B) in most parameters and it proved that their additional work was quite appropriate for their functional abilities. The only exception was greater number of complaints among working teenagers in comparison to those who didn't work (2.8 and 2.5 complaints per one person correspondingly). Further analysis showed it was due to a greater number of complaints related to locomotor apparatus such as aches in back and legs amounting to 36.3 and 59.0 per one person ($p < 0.05$).

We detected authentic discrepancies among working and not working teenagers with chronic pathologies in three parameters. 51.4% of working teenagers reported short length of sleep (6 hours) while only 22.9% of teenagers who didn't work had such a

short period of sleep ($p < 0.05$). Evaluation of one's physical state as "being poor" was another significant parameter proving health impairment in this group; 45.7% of working teenagers stated their physical state was poor and only 14.3 teenagers who didn't work evaluated their physical state similarly ($p < 0.01$). Working teenagers also had greater number of complaints per one person (3.9 and 3.7 correspondingly). It was related to growing number of complaints included into "other complaints", 42.9% among working and 14.3% among those who didn't work ($p < 0.05$).

We calculated risks of sleep deficiency, health impairment, and growing number of complaints and their relation to an assessed factor (in this case, working in spare time, table 5).

Table 5

Risks of lifestyle and health impairment
for working teenagers with different health state

Parameters	Odds relation (OR) (95% CI)	Relative risk (RR) (95% CI)	Degree of relation to a risk factor
<i>Teenagers without chronic pathologies</i>			
Complaints related to locomotor apparatus	2.5 (1.3–4.9)	1.6 (1.15–2.3)	Average
<i>Teenagers with chronic pathologies</i>			
Sleep deficiency	3.6 (1.16–11)	2.25 (1.1–4.6)	High

Poor physical state	5.0 (1.5–17.1)	3.2 (1.3–7.7)	High
“Other complaints”	4.5 (1.3–15.5)	3.0 (1.1–8.46)	High

It was proved that higher risks of sleep deficiency and health impairment were typical for teenagers with chronic pathologies and they were greatly dependent on employment factor. Negative influence of employment on teenagers without chronic pathologies was not so apparent; there was a higher risk of complaints related to locomotor apparatus and the relation degree was average.

Life quality assessment with the use of MOS SF-36 in compared subgroups of college students showed similar results (table 6).

Additional work didn't have any significant influence on life quality parameters for teenagers without chronic pathologies. But working teenagers with chronic pathologies had lower a life quality parameter related to MH scale describing their mental state (61.1 ± 2.8 and 70.1 ± 2.8 correspondingly, $p < 0.05$), and this can be caused by additional work and exhaustion.

Table 6

Life quality parameters for college students
with employment factor and health taken into account

Parameters	PF*	RPF	P	GH	AL	SF	REF	MH
<i>Subgroup B (healthy), M ± m</i>								
Work (n = 61)	88.1 ± 2.5	73.8 ± 3.2	76.5 ± 2.8	71.4 ± 2.4	64.9 ± 2.4	78.5 ± 2.6	72.8 ± 3.9	71.8 ± 2.2
Don't work (n = 113)	90.6 ± 1.2	76.6 ± 2.8	80.0 ± 2.0	72.2 ± 1.8	65.8 ± 1.9	79.0 ± 2.2	75.5 ± 3.3	68.5 ± 1.7
<i>Subgroup A (with chronic pathologies), M ± m</i>								
Work (n = 35)	86.9 ± 3.3	63.2 ± 5.6	67.8 ± 3.9	58.7 ± 2.8	56.3 ± 2.8	70.6 ± 4.0	64.7 ± 5.4	61.1 ± 2.8
Don't work (n = 35)	82.9 ± 3.0	69.9 ± 4.7	68.8 ± 3.5	65.6 ± 3.2	60.0 ± 3.8	77.1 ± 3.7	65.7 ± 6.1	70.1** ± 2.8

Note: * – Scales are given in table 3; ** – $p < 0.05$ (as per Student's criterion).

Conclusion. Our research results prove that labor activity of teenagers nowadays is mostly determined by social factors as they start working due to economic reasons and we can see similar conclusions in works of other authors [2,3,4,6,8], although there are still some other important motives related to getting practical experience and professional orientation. Wish to become economically active and independent should be viewed as a positive experience in the process of teenagers' socialization. But at the same time teenagers' employment can become a risk factor under certain conditions. Prevalence of informal employment without official job placement, absence of complete information about employment details and structure is potentially risky as it lowers social security of under-aged workers, especially when production injuries occur; it also leads to greater possibility of law violations by employers [4,10,11,12,14].

Early employment of senior pupils had negative influence on their lifestyle as it led to

greater spread of “adult” negative behavioral stereotypes (smoking, alcohol drinking, drugs tasting); it also made for day regimen disturbance in the form of sleep deficiency. Risks of more frequent catarrhal diseases and headaches can be evidence of fatigue cumulating related to increased combined study and work load and insufficient rest during vacations.

As for college students working in their spare time their lifestyle didn't change considerably, evidently, due to already existing prevalence of bad habits. Higher risks of locomotor apparatus disorders detected in the subgroup of healthy teenagers are rather obviously related to peculiarities of students' work (a greater number of students with constant work and students involved in work with considerable physical efforts). Working teenagers with chronic pathologies are the most vulnerable. It is proved by their sleep deficiency, poorer physical state, and growth of undifferentiated complaints highly related to

employment factor, as well as impairment of such integral parameter as life quality related to health.

At the same time we found out that most teenagers were employed without any documents and therefore they didn't have any medical check-ups before starting to work and didn't get any professional medical advice as it is stated in corresponding orders. When carrying out preventive students' check-ups doctors should take early employment factor, possible reactions related to it and influence of labor on health (allergic reactions, fatigue, frequent acute respiratory virus diseases, acute states of chronic pathologies etc.) into account. It will help to detect reasons for a teenager's health impairment and give him or her

targeted individual recommendation on choice of work, day regimen and permissible load. A doctor should advise teachers and parents how to protect working teenagers' health.

As employment is widely spread among students we realize the necessity to implement educational programs aimed at increasing readiness of teenagers for independent labor and job placement rules, choice of professional activity taking their health into account. We should carry out both targeted professional orientation in educational establishments and hygienic training as well as training dedicated to health protection and labor safety for juvenile workers.

References

1. Baranov A.A. Sostojanie zdorov'ja detej v Rossijskoj Federacii [Children's health state in the Russian Federation]. *Pediatrics*, 2012, vol. 91, no. 3, pp. 9–14. (in Russian).
2. Vasil'eva E.N., Guljahin V.N. Jekonomicheskaja socializacija molodezhi: opyt regional'nogo issledovanija [Learning youth economic socialization: a regional study]. *Sociologicheskie issledovanija*, 2014, no. 8, pp. 115–119. (in Russian).
3. Ivanov V.Ju. Rannij vyhod na rynek truda i problemy social'no-trudovoj adaptacii podrostkov [Early access to the labor market and the problems of social and labor adaptation of teenagers]. *Shkola zdorov'ja*, 2011, no. 1, pp. 8–11. (in Russian).
4. Ivanov V.Ju. Gigienicheskie aspekty trudovoj zanjatosti podrostkov [The hygienic aspects of adolescents employment]. *Zdorov'e naselenija i sreda obitanija*, 2013, no. 12, pp. 35–37. (in Russian).
5. Kuchma V.R., Shubochkina E.I., Ivanov V.Ju., Ibragimova E.M. Kachestvo zhizni i mediko-social'nye osobennosti podrostkov, obuchajushhihsja v raznyh obrazovatel'nyh uchrezhdenijah [Quality of life and medico-social aspects of the Russian teenagers who are training in different educational institutions]. *Bjulleten' Vostochno-Sibirskogo nauchnogo centra SO RAMN*, 2013, no. 3–1(91), pp. 75–80. (in Russian).
6. Nagimova A.M., Safulina F.R. Sovmeshhenie obuchenija v vuze i trudovoj zanjatosti studentov Kazani [Combination of university training with employment among Kazan" students]. *Sociologicheskie issledovanija*, 2014, no. 4, pp. 121–124. (in Russian).
7. Professional'nyj risk dlja zdorov'ja rabotnikov: Rukovodstvo [Professional risk to workers' health: a guide]. In: N.F. Izmerov, Je.I. Denisov, Moscow: Trovant, 2003, 448 p. (in Russian).
8. Rodionova A.V. Trudovaja zanjatost' studentov v kontekste obuchenija (na primere Sankt-Peterburga) [Employment of students in context of learning (on the example of Saint-Petersburg)]. *Teorija i praktika obshhestvennogo razvitiya*, 201, no. 7, pp. 80–85. (in Russian).
9. Cherednichenko G.A. Novoe v obrazovanii i professional'noj dejatel'nosti molodezhi [New in educational and professional activities of young people]. *Sociologicheskie issledovanija*, 2009, no. 7, pp. 119–125. (in Russian).
10. Shubochkina E.I., Ivanov V.Ju. Pravo detej na bezopasnyj trud – zakonodatel'stvo i real'naja praktika [Children's right to a safe work – legislation and actual practice]. *Prava rebenka*, 2009, no. 1, pp. 12–15. (in Russian).
11. Dal-Santo J.A., Bowling J.M. Characteristics of teens with and without work permits. *American Journal of Industrial Medicine*, 2009, Nov. 52(11), pp. 3841–3849.
12. Santana V.S., Cooper S.P., Roberts R.E., Arajo-Filho J.B. Adolescent students who work: gender differences in school performances and self-perceived health. *International Journal of Occupational Medicine and Environmental Health*, 2005, no. 11(3), pp. 294–301.
13. Ware J.E., Snow K.K., Kosinski M., Gandek B. SF-36 Health Survey: Manual and interpretation guide. The Health Institute, New England Medical Center, Boston, 1993.
14. Zierold K.M., Appana S., Anderson H.A. Working for mom and dad: are teens more likely to get injured working in family-owned businesses? *Journal of Community Health*, 2012, Feb. 37(1), pp. 186–194.

Ivanov V.Yu., Shubochkina E.I., Ibragimova E.M. The employment of high school pupils and vocational school students: medical and social aspects, health risks, approaches to optimization. *Health Risk Analysis*, 2016, no. 2, pp. 28–35.